



MSME Umbrella Programme

Policies and Programmes

Volume VIII

Assessment and Strategic recommendations of Tool Rooms by Grant Thornton

- **Consolidated Assessment Report**
- **Action Plan and Strategic Recommendations Report**
- **Individual As is Assessment Report of all 10 Tool Rooms**
- **Monitoring Tool**



Strategic Assessment of MSME Tool Rooms

Consolidated As Is report

Prepared for

**Micro, Small and Medium Enterprises
Umbrella Programme**



Knowledge Partner:



Grant Thornton

Contents

	Page
Abbreviations and Acronyms	3
Executive Summary	5
Section A- Background	9
Section B – TDM Industry Scenario in India	16
Perspective	16
Significance of Manufacturing Sector	16
Contribution of MSMEs in Manufacturing	18
Key Drivers of Manufacturing Growth – Sub Sectors	18
Role of Tool Die and Moulds (TDM) in Driving Competitiveness in Manufacturing Sector	19
TDM Demand	23
Main Sources of TDM	23
Pastgrowth trend in the TDM industry	26
Growth Projections in TDM	29
TDM Industry Growth – Essential to Support Manufacturing GDP	29
Section C – Performance of MSME Tool-Rooms	31
1. Policy Goals	31
Change in environment	33
Responding to the change	34
2. Strategic Assessment	36
2.1 Past Performance: The combined performance of 10 Tool-Rooms is as follows:	36
2.2 Performance Drivers	42
2.3 Performance Snapshot of the 10 Tool-Rooms	54

Abbreviations and Acronyms

ABC	: Activity Based Costing
CAD	: Computer Aided Design
CAGR	: Compound Annual Growth Rate
CAM	: Computer Aided Manufacturing
CITD	: Central Institute of Tool Design
CMM	: Capability Maturity Model
CNC	: Computer numeric control system
CTR	: Central Tool-Room
DANIDA	: Danish International Development Agency
DC	: Development Commissioner
EDM	: Electric discharge machining
GDP	: Gross Domestic Product
GFR	: General Financial Rules
GOI	: Government of India
HRD	: Human Resource Development
IGTR	: Indo German Tool-Room
MIS	: Management Information System
MoMSME	: Ministry of Micro, Small and Medium Enterprises
MSME	: Micro, Small and Medium Enterprises
MSMED	: Micro, Small & Medium Enterprises Development
NMCC	: National Manufacturing Competitiveness Council
NTTF	: Nettur Technical Training Foundation
OEM	: Original Equipment Manufacturer
PSU	: Public Sector Undertaking
R & D	: Research & Development
ROI	: Return on Investment
SIDO	: Small Industries Development organization
TAGMA	: Tool and Gauge Manufacturers Association of India
TDM	: Tool, Die and Mould
TRTC	: Tool-Room and Training Centre
UNDP	: United Nations Development Programme

Executive Summary

Development of micro, small and medium scale industrial units has been an important feature of the Government of India's (GOI) Industrial Policy. In addition to fiscal incentives, industrial development programmes of GOI have been directed towards the development of infrastructure conducive for the growth of the manufacturing industry.

Manufacturing excellence begins with tools and dies; this makes the Tool-Room the backbone of the manufacturing industry. Ministry of MSME, Government of India had set up tool rooms for Micro, Small and Medium Enterprises (MSMEs) for better tooling, expertise and creation of avenues for training manpower in this field, making tool rooms highly capital intensive. Expertise in design, tool-making and training was needed. These tool rooms were established with technical co-operation both under bilateral and multilateral programmes.

These Tool Rooms provide production facilities of tools, tool parts of other precision components, product design & tool design by use of latest CAD software packages, precision machining and heat treatment, rapid prototyping, training, long term courses and short term courses in related subjects and consultancy to improve productivity.

GIZ is supporting the DC-MSME in a review of the existing ten MSME Tool-Rooms to evaluate their long-run performance, recommend improvements in their services, outreach and revenues, and define a time-bound action plan to implement these recommendations. The primary objectives of these recommendations are to enable the Tool-Rooms to be financially self-sufficient and increase outreach of its services for the benefit of MSMEs.

Grant Thornton undertook in depth assessment of ten MSME tool rooms under the programme on aspects like financial performance, output, internal processes, impact, outreach, capability, etc. The performance was analysed against the backdrop of market opportunity and emerging needs of the tooling industry as well as MSMEs to develop way forward and recommendations. The following is a summary of the industry context, performance of the programme and performance drivers that contributed towards it.

The Indian economy has been on a growth trajectory, averaging around 8.2 per cent GDP growth during the Eleventh Plan Period and 7.8 per cent achieved during the Tenth Plan. It is envisaged that India has the potential to become the third largest country in the world in terms of GDP in two decades. To achieve the targeted growth, the share of manufacturing GDP is required to increase significantly. Manufacturing contributes about Rs. 30 lakh crore to the country's revenue. More importantly, the sector contributes a disproportionately large share of nearly 50 per cent to the exports from the country. Besides, around 12 per cent of the workforce today finds employment in this sector.

The manufacturing sector has grown at a robust rate over the past 10 years and after China, India has been one of the best performing manufacturing economies – growing at 6.8 per cent per annum. However, the share of the manufacturing sector in GDP is only 15 per cent in India, compared with 34 per cent in China and 40 per cent in Thailand or other developing economies.

Micro Small and Medium Enterprise (MSMEs) provide the foundation for the manufacturing sector in all large manufacturing countries, whether USA, Japan or China. Even in India, SMEs have been major contributors to the generation of employment within the manufacturing sector, and even to its exports. Almost 50 per cent of the manufacturing GDP is from the MSME sector.

It is critical to understand the different sub-sectors within the manufacturing sector and their contribution to growth. Transport equipment (including auto and auto components), electrical machinery, metal products (including capital equipment) and textiles (including apparel) contribute 42 per cent per cent of the total output generated by the manufacturing sector. Sub-sectors like Auto and Auto Components, rubber and petroleum products, electrical machinery and metal products (including capital goods) are the fastest growing industries. All the above mentioned high growth sub-sectors are heavy users of tooling. The competitiveness of these sectors depends significantly on their capabilities in Tools, Dies and Moulds (TDM). The cost of production, product innovation and scale is driven by TDM to a large extent.

As estimated by Tool and Gauge Manufacturers Association of India (TAGMA), the total tooling demand stands at Rs.13,225crore. Generally tooling required by the manufacturing sector are made in Captive Tool Rooms of the manufacturers, imported or outsourced to Commercial Tool-Rooms. Rest. 3120 crore of the tooling demand is met by Captive Tool Rooms, Rs.5955 crore by Commercial Tool Rooms and Rs.4150 crore by Imports.

Given that the major TDM user sub sectors are likely to have double digit growth over next 4 to 5 years led by Auto Components, Plastics, Electrical Goods, etc., there is going to be a significant growth in the demand for TDM. As per the recent study conducted by TAGMA, the total TDM demand in 2014-15 is expected to reach Rs.23,620 crores.

While the increase in the demand for TDM and the growth in upstream industries is well established, the actualisation will face many challenges which are additional investment of more than Rs.10,000 crores, high technology obsolescence, low returns on investment, lack of skilled manpower, technology and process Upgradation.

As the Indian industry developed there was phenomenal growth in the requirement for better tooling and skilled manpower. All this necessitated the development of tooling infrastructure. The Government of India therefore planned institutional support in the area of tooling. These Tool-Rooms were mandated to provide production related services primarily to small scale industries while the concept of micro and medium scale industries was added later on.

A consolidated overview of the ten tool rooms is given below:

Area	Analysis
Training	- Steady growth in the training output from the Tool-Rooms. - The training output has increased by more than 300 per cent over the last 5 years and increase has been similar in both short and long duration courses. - In terms of absolute numbers, the share of long-term courses is 30 per cent and balance is contributed by the short term courses.
Production	- The production output has not grown significantly over the years; it was Rs.20 crores in 2006-07 and increased only by 30 per cent in 5 years to about Rs.26 crores last year. - Significant share of production is from component production/ job work for large scale units and PSUs which is good for revenue generation but does not contribute towards strategic objectives of the Tool-Room programme.

Revenues	- Steady growth in revenues from the Tool-Rooms with training revenue exceeding the production revenue significantly and also growing at a faster rate over the last 6 years. - Considering that the total gross block of Tool-Rooms is Rs.513 crores, the total revenues of Rs.74.87 crores are very low.
MSMEs Benefited	- The share of MSMEs in total revenue of the Tool-Rooms is 26 per cent in the last year which is up from 20 per cent in 2006-07 while there is significant increase in the number of MSMEs served. - At 26 per cent of revenues, the total value is Rs.6.76 crores which is contributed by 10,667 MSMEs at an average order value of Rs.6000 indicating that majority of MSMEs users are not using tooling services but testing and quality assurance services or minor machining or heat treatment facilities.
Cost Recovery	- 5 Tool-Rooms have been consistently achieving cost recovery without depreciation, - Aurangabad and Bhubaneswar have achieved full cost recovery including depreciation.

The performance drivers for the ten tool rooms based on the above performance are summarised below:

1. **Autonomy** - Tool-Rooms are set up as autonomous bodies, Government of India societies, and have greater autonomy in comparison to Government offices or institutes like MSME Development Institutes. But still, to a large extent, these are guided by Government policies and in some cases even by Government rules and regulations. Given that the Tool-Rooms are not financially independent and depend heavily on public money, the autonomy built in is less effective. For greater autonomy of a Tool-Room, the greater is the need for financial independence, transparency and accountability.
2. **Steering Mechanism** - The Governing Councils are constituted in consultation with General Managers. These are currently made up of ex officio members and very few independent members. Meetings of the councils are less frequent than intended, in many cases convened once in a year. It generally coincides with the annual general meetings convened for approving the annual accounts and annual reports which takes precedence over other strategic matters. As a result, there is no clear distinction between Tool-Room management/ administration, and higher decision-making and supervisory responsibilities, which fall on the Governing Council.
3. **Key Performance Indicators/ Annual Targets** - Monitoring of performance is mainly on financial parameters and not as much on outreach and impact. Management efforts are directed accordingly. Production which was a major part of revenue earlier, is today down to one third. A clear reason that emerged from interactions with the stakeholders is that because of the present policy direction emphasis is shifting towards component productions and training thus diluting outreach to MSMEs in the more important area of tooling. The focus on financial performance has definitely helped a great deal in increasing efficiency and bringing about financial discipline, however, this needs to be augmented with additional measures to bring effectiveness and alignment to the overall mission and strategy of the Tool-Room programme.
4. **Understanding of Costs** - While estimates are prepared for quoting and hours are allotted at various machining centres at the time of process planning, actual times taken at various cost centres generally exceed the estimated hours and, therefore, the cost estimates. A system to compare and analyse the cost estimates prepared at the time of quoting and actual cost on completion and analysis of reasons for deviations for future guidance is on low basis in all Tool-Rooms.
5. **Procurement System** - For procurement of raw materials for tool-making, the Tool-Room needs to follow the procurement guidelines laid down in the General Financial Rules (GFR) calling for quotations and decision making guided by L 1 principle due to which suppliers tend

to quote lower rates, sometimes compromising on quality. Development of procurement manuals covering the operational details would be beneficial to improve efficiency and effectiveness of procurement.

6. Services - The training services are considered to be among the best and there is steady rise in training output too. However, given the growth anticipated in the engineering sub sector, there is going to be significant gap between the industry demand and supply of skilled manpower. The Tool-Rooms have an opportunity to increase their output in training, especially the long term courses which will impact the skill shortage too. All Tool-Rooms have earned the reputation of good quality tool makers.
7. Human Resources- Manpower strength in Tool-Rooms varies, according to requirement, from nine in Guwahati to 118 in Ludhiana. High wage is a major expense, at some places it is a problem which management is trying to address by not filling higher posts at the expense of risk of de-motivation. Wage bill share is, 73 per cent
8. Incentive Scheme - Tool-Rooms have been allowed to adopt incentive schemes based on the overall guidelines and limits decided centrally by DC-MSME. This is a group incentive scheme and does not take into account individual performance. The scheme lays stress on increasing generation of surplus of income over expenditure, 25 per cent of which is allowed to be distributed to the employees. There are restrictions on maximum amount payable, three month's salary if a Tool-Room has recovered cost without depreciation and four month's salary if it has recovered cost including depreciation.

Tool-Rooms do not have the independence to adopt their own incentives for better performance. The scheme is good for those Tool-Rooms which are already doing better but has not been able to motivate employees of Tool-Room which are not recovering costs. In some Tool-Rooms employees have declined to accept it.

9. Skill and capacity building - Skill and knowledge development programmes are needed for existing employees. Apart from acquiring new skills and knowledge such programmes enhance employees' motivation.

The tool room programme has significantly contributed to the competitiveness of the manufacturing sector especially the MSMEs through its skill development and infrastructure support for tooling. The programme has tremendous potential to continue contributing towards competitiveness enhancement of the manufacturing sector through scaling up of skill development and capacity building of private MSE tool rooms. These along with other strategic recommendations for operational and structural efficiency are discussed in the action plan report.

Section A- Background

The Context

Development of micro, small and medium scale industrial units has been an important feature of the Government of India's (GOI) Industrial Policy. In addition to fiscal incentives, industrial development programmes of GOI have been directed towards the development of infrastructure conducive for the growth of the manufacturing industry. This included support in technology through creation of common facilities. Over the years as MSMEs developed, their demands for modern technologies also became stronger while common facilities' workshops at Small Industries Service Institutes, under Small Industries Development Organization, Ministry of MSME, became inadequate in terms of manufacturing technologies and training avenues in use of current technologies and design practices.

Manufacturing excellence begins with tools and dies; this makes the Tool-Room the backbone of the manufacturing industry. The industry needed better tools to improve quality and productivity. The availability of proper quality tooling was an important issue that had to be addressed. Sources to meet this demand were:

- in-house manufacture or captive Tool-Rooms which only large scale industries could afford because of the high investment needed
- imports which were difficult in the past as import licenses were needed, and customs duties were high
- commercial Tool-Rooms which were not adequate again because of high investments needed.

Coupled with the need for additional tool design and tool-making facilities, there was shortage of trained tool designers, tool makers and other associated skills in Mechanical Engineering and Tool Engineering trades.

As private entrepreneurs were not coming forward to boost indigenous resources for tooling commensurate with the needs of the industry, the Government of India had to step in to set up instruments of promotion for common facilities and other institutional support for small and medium industries in terms of access to better tooling, expertise and creation of avenues for training manpower in this field. Tool-Room equipment tended to be expensive making Tool-Rooms highly capital intensive. Expertise in design, tool-making and training was needed. The Government of India therefore looked for technical co-operation both under bilateral and multilateral programmes.

The first government supported Tool-Room was set up in Hyderabad in 1969 as the Central Institute of Tool Design with the assistance of the United Nations Development Programme (UNDP). The need became more intense with the growth of the Indian economy and India faced strong international competition with the advent of liberalisation. The growth and diversification of the Indian industry increasingly shifted from simple to technically complex products particularly for engineering and plastics industry that need complex tools and skilled manpower. Technical Co-operation Programmes between the Government of India and Government of Germany and Government of Denmark made significant contributions to meet this need. Total German and

Danish assistance made available under the technical programmes in Tool-Room sector was in the range of DM 90 million and DKK 247 million. Presently 10 Tool-Rooms are operating under the Office of Development Commissioner, Ministry of Micro Small and Medium Enterprises. For greater autonomy all the Tool-Rooms are registered as societies under Societies Registration Act and managed by Governing Councils with Development Commissioner – MSME as the Chairman. Each Tool-Room is headed by a General Manager as its Chief Executive. Tool-Rooms spread across India are detailed in Table 1:

Table 1

External Support	Name	Location	Established
Government of Germany	Central Tool-Room	Ludhiana	1979
	Indo-German Tool-Room	Ahmedabad	1995
	Indo-German Tool-Room	Aurangabad	1995
	Indo-German Tool-Room	Indore	1995
Government of Denmark	Central Tool-Room and Training Centre	Kolkata	1978
	Central Tool-Room and Training Centre	Bhubaneswar	1995
	Indo-Danish Tool-Room	Jamshedpur	1995
UNDP	Central Institute of Hand Tools	Jalandhar	1991
	Central Institute of Tool Design	Hyderabad	1969
No External Support	Tool-Room and Training Centre	Guwahati	2002

Executing agencies on behalf of the Government of Germany, Government of Denmark and Government of India, respectively, were:¹

- Deutsche Gesellschaft fuer Internationale (GIZ)
- Danish International Development Agency (DANIDA)
- Office of Development Commissioner, Micro Small and Medium Enterprises

Apart from assistance in the form machines and equipment, in some cases buildings and technical expertise was provided to the projects by UNDP, GIZ and DANIDA. Experts in the areas of tool design, CNC programming and operations of CNC machines, planning and management were posted at all project locations except Guwahati which has been set without any external assistance. Programme offices set up in New Delhi by both the governments provided managerial support and carried out studies to formulate Systems, Procedures and Methods and assisted in exchange of data between the projects by supporting meetings of General Managers and other functionaries of Tool-Rooms of the two programmes. This assisted systems and expertise developed at one Tool-Room to be used at other Tool-Rooms. Indo-Danish Tool-Room and Indo-German Tool-Room Programmes were completed in 2001 and 2003, respectively. Tool-Rooms are now functioning without any external assistance.

Tool-Rooms provide the following services:

- production facilities of tools, tool parts and short run of other precision components, preferably for MSMEs
- product design & tool design by use of latest CAD software packages
- precision machining and heat treatment
- rapid prototyping

¹Tool-Rooms under the state governments are outside the scope of this study.

- training, long term courses in Tool-Making and short term courses in related subjects and CNC technology
- consultancy to improve productivity.

Services are provided on payment basis for full cost recovery except training for which fixed fees are charged, generally subsidized. Any subsidy on training activities needs to be garnered from other services. Tool-Rooms have a mandate for self-sufficiency and emphasize on assisting MSMEs.

Objectives of Assignment

We understand that GIZ is supporting the DC-MSME in a review of the existing ten Tool-Rooms to evaluate their long-run performance, recommend improvements in their services, outreach and revenues, and define a time-bound action plan to implement these recommendations. The primary objectives of these recommendations are to enable the Tool-Rooms to be financially self-sufficient and increase outreach of its services for the benefit of MSMEs.

Deliverables of the assignment are:

- an institutional/ organisational development study of the agencies
- an As-Is assessment of the ten Tool-Rooms as-of-date in terms of parameters including management, finance, human resources, skills, equipment, technology and physical infrastructure
- a quantitative ranking of the ten Tool-Rooms based on multiple parameters related to organisation, governance, finance, services etc.
- a time-bound, cost estimated action plan for the Tool-Rooms to increase three parameters: (a) revenues from services (b) number of trainees covered and (c) number of industries covered by services.

Scope of services offered:

A. Coverage:

The study covered the following services from 10 Tool-Rooms:

PRODUCTION RELATED SERVICES
Manufacture of tools and dies, moulds, jigs, fixtures, gauges and similar items
Testing of tools and dies, moulds, jigs and fixtures
Production of precision tool parts and components
Production of standard tool parts
Application of Computer Aided Manufacturing
Manufacture of small series and demonstration of pilot production runs
Heat treatment including vacuum heat treatment
Resetting, reshaping and maintenance of tools and dies
DESIGN AND DEVELOPMENT RELATED SERVICES
Product Design
Development of prototypes
Design of tools & dies moulds, jigs and fixtures
Standardisation of tool components
CAD jobs for individual customers
QUALITY CONTROL RELATED SERVICES
Quality control of tools and products
Manufacture of gauges

Metrology services
Testing of outside, new or old, tools
TRAINING SERVICES
Long-term certificate, diploma and other courses
Short term, standard or tailor-made courses for individuals and company employees - tool and die makers, machine operators, designers, supervisors
Training in CNC technology and heat treatment
Training in inspection, quality control, testing, and maintenance
CONSULTANCY SERVICES
Consultancy in production technology (processes, materials, products)
Consultancy in Tool Design
Consultancy in selection of machines and other manufacturing aids
ANY OTHER SERVICE INCIDENTAL TO THE TOOL-ROOM OBJECTIVES

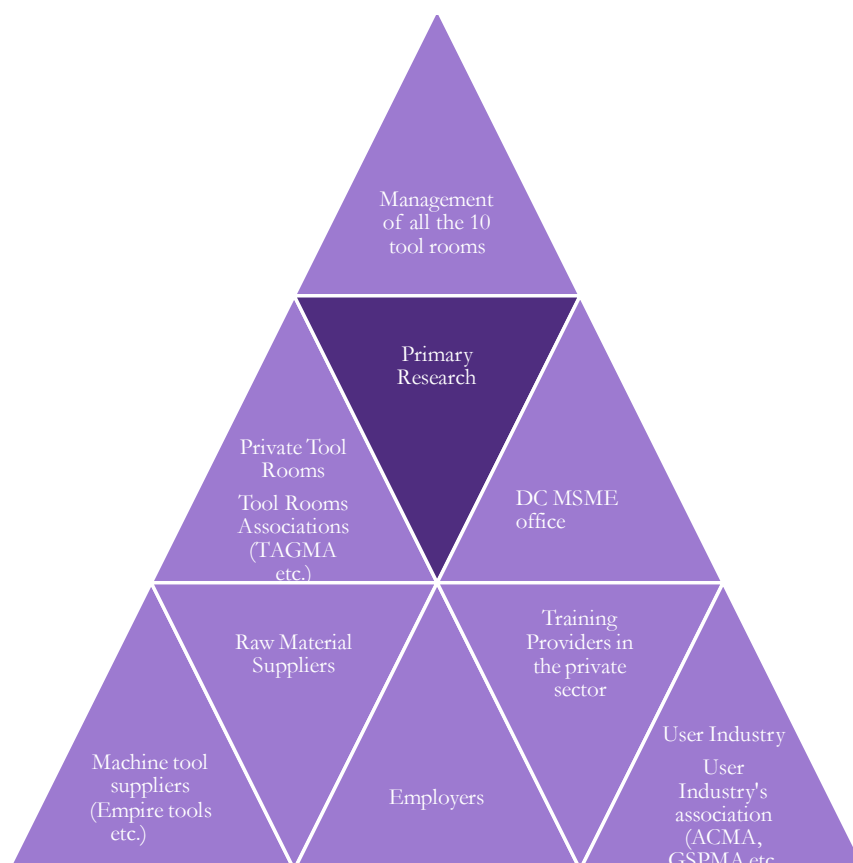
Approach and Methodology

Grant Thornton implemented an objective-based approach to assessment. The assessment essentially focused on how the results of Tool-Rooms measure up against their stated objectives. The primary objectives of establishing these Tool-Rooms may be summarized as below:

- promote industrial progress in respective regions
- enhance capacities of MSMEs to upgrade to more efficient and productive technologies (design and development of precision tools, dies and moulds)
- transfer of knowledge and skills
- aid in creating employment opportunities
- mobilize knowledge, skills, information and technology in order to aid in creating competitive MSMEs.

Data was collected through secondary research, publicly available information on MSME Tool-Rooms and through a structured questionnaire, filled by the respective Tool-Rooms. Facilities of the Tool-Room were visited and series of meetings and discussions took place with senior and middle management of the Tool Room, local associations, suppliers, users and non-users MSMEs, large client and state government agencies for qualitative assessment.

The methodology for the assignment is illustrated below, it covered secondary research



followed by visits to all ten Tool Rooms and consultations with other stakeholders like user industry, commercial Tool-Rooms, DC-MSME office, machinery suppliers, etc.:

Primary Research

During the course of the study, Grant Thornton had consultations with the following:

- Management of all 10 Tool-Rooms under the scope of the study
- User Industry
- Private Tool-Rooms
- DC-MSME Office
- Machinery Suppliers
- Raw Material Suppliers
- Employers
- Training Providers in the Private Sector

Secondary Research

To develop an understanding of the context of each of the Tool-Rooms in terms of:

- cluster scenario and competitiveness concerns
- key stakeholders
- performance indicators of the targeted Tool Rooms
- market scenario – demand, supply and pricing
- services offered.

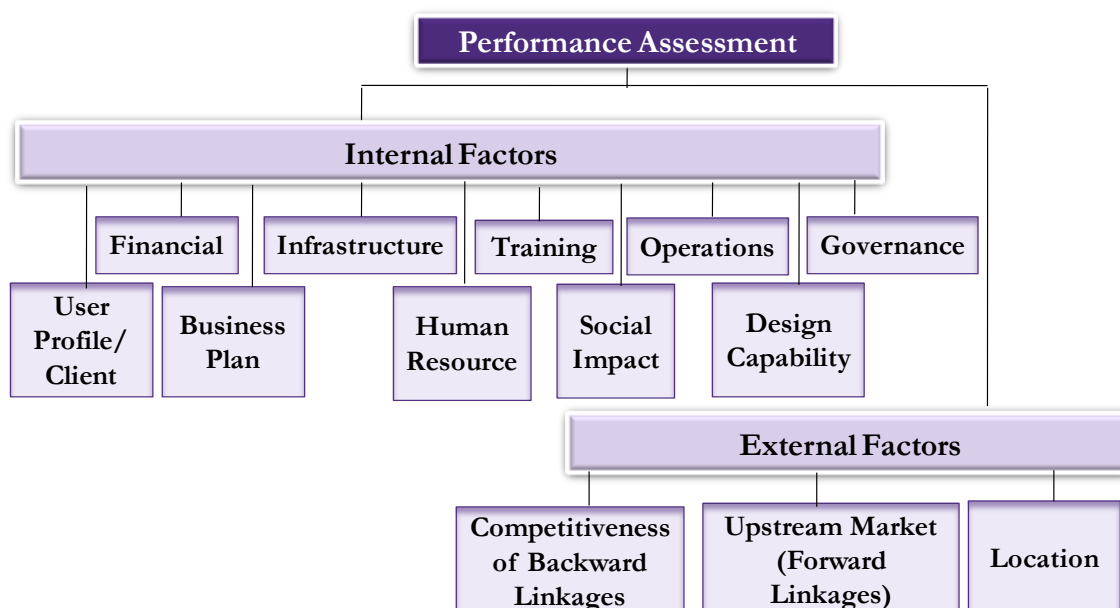
Following were the key sources of such secondary information:

- Annual Reports of the targeted Tool-Room
- Earlier evaluation reports

Development of Assessment Tools

Based on the interactions with DC-MSME, GIZ, private commercial Tool-Rooms, Tool-Room association, a performance assessment parameter was designed.

The diagrammatical representation of the performance assessment indicators is given below:



The performance assessment indicators have been detailed below:

Internal Factors

- **User Profile/Clients**
 - Sophistication of Clients
 - Size of the clients
 - Sector / Segment Focus
 - Geographic Spread - Outreach
 - Client retention – frequency of revisit
- **Financial**
 - Year on Year Turnover Growth
 - Net Worth of the Tool-Room for the last five years
 - Contribution trend towards
 - Training
 - Client typology
 - Net Profit Trend
 - Income to investment ratio
 - Payback Period of recent investments
- **Human Resource**
 - Incentive System for the employees
 - Experience of the employees and the teachers
 - Qualification of the employees and the teachers
 - New Skill Acquisition – Recent trainings attended
 - Retention of talent – Counterparts trained by foreign experts
- **Infrastructure**
 - Technology – Plant and Machinery viz-a-viz Industry trend
 - Physical Infrastructure
 - Workshops
 - Training classrooms
 - Hostels, etc.
 - IT infrastructure like software for Production Planning and Control etc.
 - Training infrastructure like training aids for audio-visual, training software, etc.
- **Institutional Strength**
 - Linkages to Global knowledge institutions
 - Network with other Tool-Rooms
 - Network with Alumni
 - Participation of cluster enterprises and user MSMEs
 - Management systems followed like certifications, etc.
- **Business Plan**
 - Services offered like testing, tooling, training, job work, consulting, etc.
 - Marketing plan like participation in exhibitions, trade fairs etc.
 - Procurement of raw materials
 - Analysis of the competing Tool-Rooms in the region
- **Inclusive Growth**
 - Diffusion of environmentally-friendly technologies to MSMEs

- Encouragement to weaker sections and women in training
- **Training**
 - Contribution of training income to total income
 - Outreach plan
 - Course content development
 - Selection criterion
 - Placements
 - Post Placement Tracking
- **Operations**
 - Lead time on time delivery
 - Machine Utilization
 - Quality Assurance System
 - percentage of tools accepted on first trial
 - Pricing assumptions to actual delivery variances
 - Development of SOPs
- **Design and Development**
 - CAD – CAM hardware
 - CAD – CAM software
 - Simulation packages
 - Databank
 - Number of skilled people
 - Extent of integration (CMM, CAD, CAM, CNC machines)
 - Capability of reverse engineering
- **Governance**
 - Extent of decentralization
 - Level of interaction between the Head office and the Tool-Rooms

External Factors

- **Upstream Market/Forward Linkages**

Opportunities for the Tool-Rooms in the following sectors:

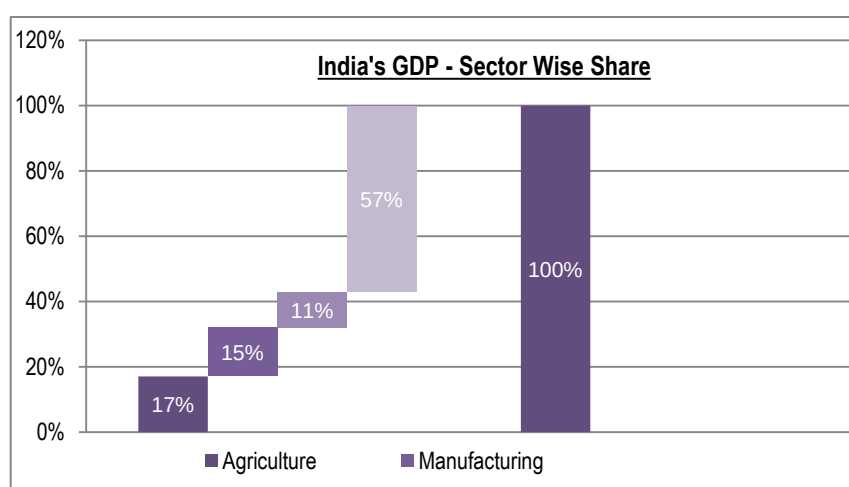
 - Auto Industry
 - Auto Ancillary
 - Wide Goods
 - Health care
 - Packaging
 - Machine tool
 - Communication
 - IT hardware
- **Competitiveness of Backward Linkages**
 - Machinery Suppliers – support in-design and service
 - Raw Material Suppliers – from source or other
 - Availability of standard die sets

Section B – TDM Industry Scenario in India

Perspective

The Indian economy has been on a growth trajectory, averaging around 8.2 per cent GDP growth during the Eleventh Plan Period and 7.8 per cent achieved during the Tenth Plan. The changes taking place in the world economy, with a shift in economic strength towards emerging markets and especially in Asia, are inherently favourable for India. Industrialised countries are likely to grow at about 3.5 per cent per year between 2010 and 2025, while developing and emerging economies are projected to grow at around 8 per cent. Within this group, developing Asia is projected to grow at around 10 per cent per year. The advanced economies' share in global GDP is projected to fall from 65 per cent in 2011 to 51 per cent by 2025, while the share of emerging economies is projected to increase from 35 per cent to about 49 per cent over the same period²

It is envisaged that India has the potential to become the third largest country in the world in terms of GDP in two decades. However, to realise this potential we need to ensure sustained rapid growth. China has grown around 10 per cent per year in real terms for 30 years and is now expected to slow down. India is currently behind China, but the evidence suggests that India has now developed the potential for sustained rapid growth over the next two decades. The economy has gained in strength on many dimensions and is therefore well placed to achieve faster, sustainable and more inclusive growth. Having achieved 8.2 per cent growth in the Eleventh Plan, 9 per cent growth for the Twelfth Plan is being targeted by the Planning Commission. The present contribution of various sectors to the GDP is given below:

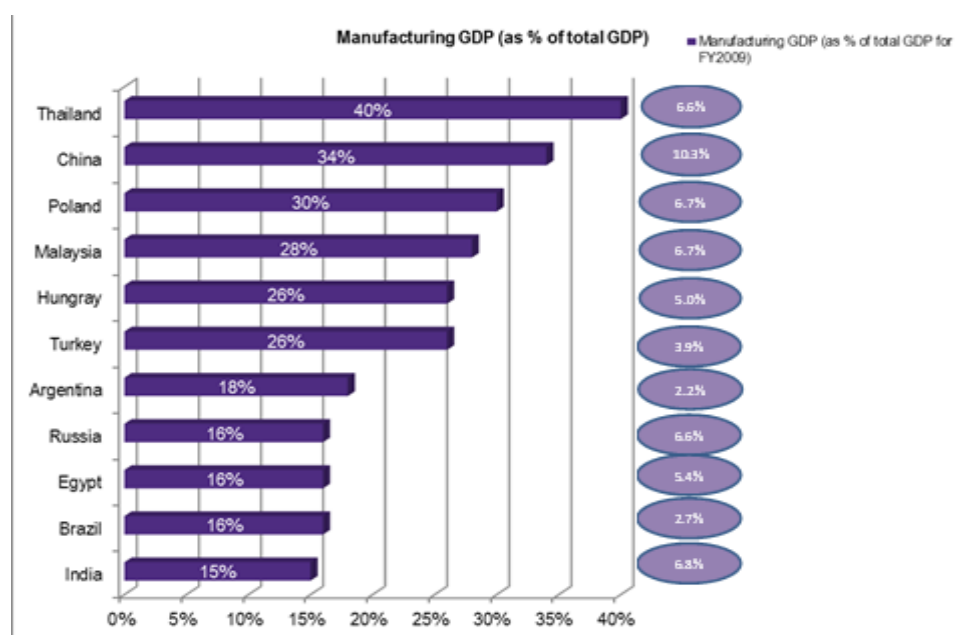


Significance of Manufacturing Sector

²The World Economic Outlook of the International Monetary Fund

To achieve the targeted growth, the share of manufacturing GDP is required to increase significantly. Manufacturing contributes about Rs. 30 lakh crore³ to the country's revenue. More importantly, the sector contributes a disproportionately large share of nearly 50 per cent to the exports from the country. Besides, around 12 per cent of the workforce today finds employment in this sector. Manufacturing sector needs to provide additional employment opportunities required for India's increasing number of employable youth. Agriculture is only expected to release more unskilled people which would be required to be absorbed by other sectors. It is well known that manufacturing sector provides transition opportunities to labour moving from low skilled (such as in agriculture) to more value added jobs. While the services sector has been growing fast, it alone cannot absorb the 250 million additional income-seekers that are expected to join the workforce in the next 15 years. Unless manufacturing becomes an engine of growth, providing at least 100 million additional decent jobs, it will be difficult for the economy to achieve the targeted growth over next 5 years. Studies have estimated that every job created in the manufacturing sector has a multiplier effect, creating 2–3 jobs in the services sector.⁴

As shown in the chart below, the manufacturing sector has grown at a robust rate over the past 10 years and after China, India has been one of the best performing manufacturing economies – growing at 6.8 per cent per annum. However, the share of the manufacturing sector in GDP is only 15 per cent in India, compared with 34 per cent in China and 40 per cent in Thailand or other developing economies. The slow pace of growth of the manufacturing sector at this stage of India's development is a concern. The need to sharply change the growth trajectory of India's manufacturing sector requires a holistic appraisal of the manufacturing sector to identify sub sectors that are doing well internationally, e.g. the cost advantage in auto industry used to be obtained through 'scale' in large factories – a well-known example of the paradigm being, large integrated auto plants in Detroit. Now activities in the value chain are dispersed across the world to combine the best with the best – such as back-end engineering services in India and Japan, component production in China and India, and assembly in many countries.



Source: TAGMA 2011

³2007-2008

⁴ Source: TAGMA

Contribution of MSMEs in Manufacturing

Micro Small and Medium Enterprise (MSMEs) provide the foundation for the manufacturing sector in all large manufacturing countries, whether USA, Japan or China. Even in India, SMEs have been major contributors to the generation of employment within the manufacturing sector, and even to its exports. Almost 50 per cent of the manufacturing GDP is from the MSME sector and it forms critical link of the supply chain of larger enterprises providing flexibility and speed. The MSME sector is also significant as more than 95 per cent per cent of all industrial establishments in the country are MSMEs, accounting for almost 85 per cent of manufacturing employment, contributing 45 per cent of manufacturing output and 40 per cent of country's export. The table below provides a comparison of MSMEs for various economies.

Table 2

MSMEs' economic contributions in select countries					
Country	per cent of MSMEs in total industrial units	Employment (per cent of total labour force)	Contribution (as per cent of mfg output)	Exports/ GDP (per cent)	Share of MSME in exports (per cent)
United States	99.7	50.3	40	12	31
United Kingdom	>99	44-66	Under 40	-	-
China	99	73	60	21	40-60
India	95	80	45	13	40
Note: Economic contributions by different countries might be for different years Source: SME Export Contribution UN Country Statistic (UNDP website), Ministry of Micro, Small and Medium Enterprises Annual Report 2010-11					

Notably, as per data in the Ministry of MSMEs Annual Report 2010-11, the MSME sector has maintained a higher growth rate than that of the industrial sector in the past five years. This remains central to the resilience that the Indian economy has demonstrated despite the global financial crisis of 2008-09. While the sustainability and growth of the MSME sector is critical to ensure healthy balance of inclusivity, employment generation and sustenance of economic development, there are several obvious constraints due to small scale and fragmented nature of this segment.

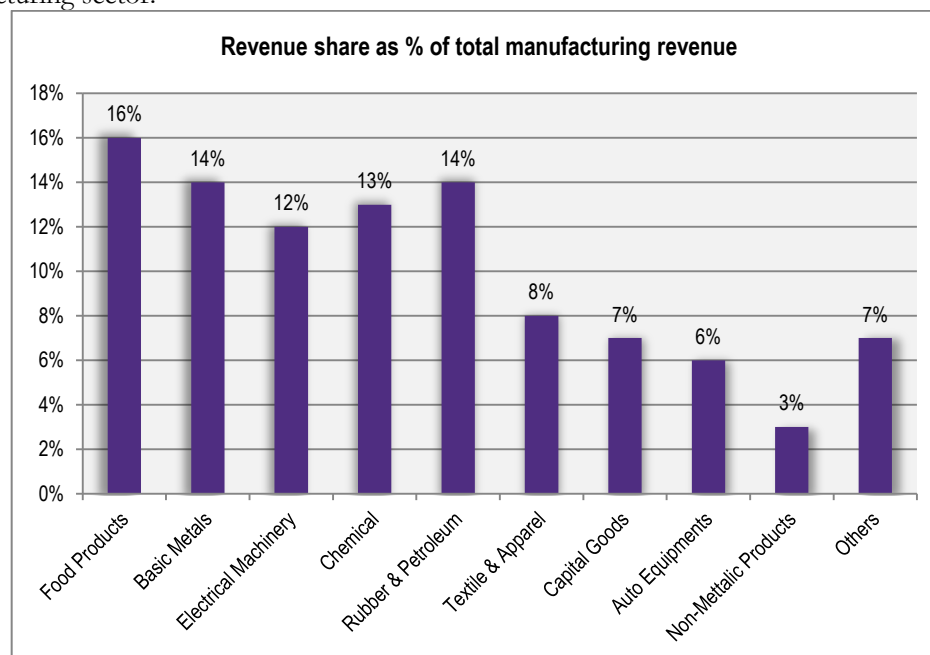
Recognising the importance of the manufacturing sector, the National Manufacturing Competitiveness Council (NMCC) is in the process of finalising a National Manufacturing Policy and Planning Commission has proposed to come up with a comprehensive 'National Manufacturing Plan', as a part of its 12th Plan exercise. This will include a set of strategies and tasks required to give a boost to the manufacturing sector so as to ensure that it grows at a faster rate and on a sustainable basis. The ultimate goal is to raise the share of manufacturing to 25 per cent of GDP and to create 100 million additional employment opportunities by 2025.⁵

Key Drivers of Manufacturing Growth – Sub Sectors

Having established the role that the manufacturing sector needs to play in achieving sustained economic growth, it is critical to understand the different sub-sectors within the manufacturing sector and their contribution to growth. The graph below represents the share of various sub-sectors in the total manufacturing revenue. As shown below, transport equipment (including auto and auto components), electrical machinery, metal products (including capital equipment) and

⁵ Planning Commission Documents

textiles (including apparel) contribute 42 per cent per cent of the total output generated by the manufacturing sector.



Source: TAGMA 2011

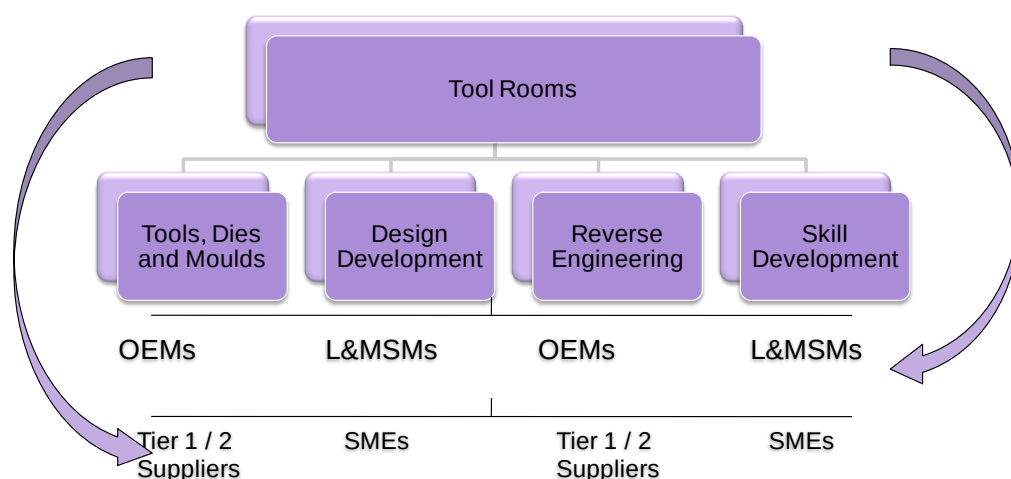
The growth rates in sub-sectors, as provided in the table below, indicate that Auto and Auto Components, rubber and petroleum products, electrical machinery and metal products (including capital goods) are the fastest growing industries.

Sub Sector	Growth Rates in Sub-Sectors		
	2008-09	2009-10	2010-11
Food Products	0.3	-1.4	7.9
Basic Metals	-7.2	-0.4	4.7
Electrical Machinery	2.73	11.25	12
Chemical	4.5	10.8	2.4
Rubber & Petroleum	-5.9	25.7	17.4
Textile & Apparel	7	9.8	11
Metal Products (Including capital goods)	-4.6	17.3	12.7
Auto Equipment(Transport)	1.9	25.9	22.3
Non-Metallic Products	1	7.7	5.3
Others	0.5	10.9	25.5

Role of Tool Die and Moulds (TDM) in Driving Competitiveness in Manufacturing Sector

It is important to note that all the above mentioned high growth sub-sectors are heavy users of tooling. The competitiveness of these sectors depends significantly on their capabilities in Tools, Dies and Moulds (TDM). The cost of production, product innovation and scale is driven by TDM to a large extent.

The linkages between Tool-Rooms and these manufacturing sub-sectors are illustrated below:



Plastics and Metal are the materials that are used today for an enormous range of components for most products in these sub sectors. Most of those products are made by Tools, Moulds and Dies. The success of products derives from the capability of designing, engineering and manufacturing the right tools

The competitiveness in these manufacturing sub-sectors depends on product development, the time to market and uniqueness. Product innovation, technological development and the optimisation of the whole manufacturing system strongly depend on innovations and developments in TDM.

Tooling plays an important role in mass production specifically, for quality, consistency and volume increase. Modern engineered products with advanced features and a very high degree of reliability need precision tooling to meet designers' expectations and customer's satisfaction. Apart from the above obvious expectations from tooling, cost reduction is an important contribution. A well designed and manufactured tooling reduces wastage through rejection and minimising factor of safety required, thereby reducing raw material cost.

Introduction of newer models with advanced features not only depends on the capability of R&D but also the ability to get the tooling ready for mass production from day one of launching. When competing, automobile manufacturers launch new models or models in new segments, the success or failure depends on the speed with which the product hits the market. Mass production tooling assumes greater importance particularly when the market accepts the product well, swelling the demand, perhaps even waiting list.

Product	Number of New Launches	
	1996-2000	2001-2005
Cars & UV (major segments)	18	28
Motorcycles	11	70

Following paragraphs summarise the role of TDM in advancing manufacturing competitiveness:

Machine tool v/s tooling: Even though designing and building of machine tools is challenging, the general concepts remain the same and contemporary concepts are available with the machine tool manufacturers. This makes the process of acquiring machine tools relatively easier. Compared to this situation, tooling is not only to be based on innovative ideas but also to be oriented towards individual components. Therefore, the competitiveness of any engineering industry depends equally on machine tools and the availability of precision TDM.

Quality through tooling:

Quantum jump is the order of the day. Incremental improvement will be of no use and the first casualty would be Quality. As the customers have raised the bar, just maintaining good quality is no more acceptable. Improving the existing quality level along with the production volume is the only mantra for survival. This is evident from the fact that even for domestic market; Indian

manufacturers have to face international competition as compared to earlier days where international quality level was essential for only exports. The TDM ensures repeatability and mass production, precision in TDM decides the quality.

Productivity through Tooling:

Innovative tooling ideas help increase productivity instead of duplicating existing facilities wherever production increase is contemplated. For e.g. a huge numbers of tyres have to be assembled every day in an automobile plant. Earlier an army of workmen were employed for this operation whereas at present machines with customised tooling make the work faster and consistent. In some of the instances single station processing can be replaced with multi-station operation simultaneously to enhance productivity. This requires planned tooling. Progressive tooling in press tool operation brings in tremendous increase in

Windsor-Essex Automotive cluster – competitiveness driven by the TDM Industry

The involvement of the Windsor area in the auto industry dates back to the first decade of the 20th century. Within the Windsor-Essex region, there are approximately 500 plants with production related directly or indirectly to the automotive industry. These plants, which employ over 48,000 workers, can be grouped into four broad categories according to their manufacturing outputs– (i) assembled vehicles - a single plant owned by DaimlerChrysler, (ii) components and automotive parts (iii) production goods such as tools, dies and industrial moulds, and, (iv) metal fabrication and treatment. A further category of “service” activity includes sequencing and packaging and design, testing, services that are often carried out in addition to a plant’s primary production.

Windsor has a broad range of core automotive parts plants tied to assembly plants in Windsor and nearby Detroit (major Automobile centre). Metal stamping, engines and engine parts, and plastic parts stand out as the three most important automotive parts sub-industries. Ford has two engine plants and two aluminium casting plants in the city and GM operates a transmission plant. Many of the other larger plants in this group are owned by leading transnational parts makers such as Lear, Siemens, Magna, Krupp Fabco, Benteler, Flex-N-Gate, Autoliv, Nemak, and Woodbridge who are Tier 1 suppliers to the OEMs.

The Auto Component cluster is supported by approximately 250 establishments in the Windsor area engaged in tool and die, fixture, and industrial mould-making, the vast majority of which are linked to the automotive industry. From its birth in the 1940s through the late 1980s, Windsor Essex was one of the three Global Centres of Excellence in the world (the others being Marinha Grande, Portugal and Stuttgart, Germany). During World War II, Windsor/Detroit was considered ‘the arsenal of North America’. At one point up to 40 per cent of Machine Tools, 45 per cent of Moulds, and 30 per cent of Dies worldwide for virtually any product were made in Windsor Essex. Over the last two decades employment in this industry grew significantly, and Windsor achieved a global reputation for innovation and quality in automotive industrial mould-making. The initial formation of the cluster was facilitated by the arrival of skilled European immigrants, the presence of a large lead anchor firm, and public investment in technical education. Subsequently, the cluster grew through skilled workers acquiring training and knowledge within one firm and then leaving to establish a network of new enterprises. Today, informal and tacit knowledge flows between firms through the movement of skilled workers between plants and through social and family networks. Over the last two decades, Windsor TDM makers have achieved a global reputation for innovation and quality.

The TDM industry consists of mainly small plants with fewer than 50 employees (Table 1). Many of these plants are highly specialized, use highly sophisticated CAD/CAM capital goods and a highly skilled labour force. The ability to develop products from conception to use on the customer’s production line appears to be a necessity for even the smallest plants. The TDM sector is an acknowledged technological leader and exports much of its production outside the Region. Many of the firms are highly specialized, privately owned by self-made entrepreneurs with little formal education but strong skilled technical backgrounds, and employ highly skilled mould makers who earn high wages in non-union shops. A recurring theme is that “most of the [mould] shop owners are not trained business men. They learned to run a business as a result of being good mould makers. Most innovation appears to be incremental and to originate from the skilled workers on the shop-floor, rather than through more formal R&D activities. The development of the cluster was principally a function of tacit knowledge being acquired by a worker at one firm who then either left to work in another shop or branched out on his own

productivity and also saves a lot of handling, transportation and space. In die casting and injection moulding, multi-cavity dies/moulds bring in productivity.

Deskilling through tooling: Requirement of skills can no more be an excuse for lack of quality and productivity. In the Indian context more and more sub-contracting to MSMEs is not only cost effective but also oriented towards employment generation. To ensure that the quality of output from MSMEs is standardised across vendors, supply of proper tooling to MSMEs is essential.

Waste reduction through tooling: A properly designed die for die-casting can eliminate machining and in cases where machining cannot be eliminated it can at best be reduced, resulting in material cost savings. A well laid out blanking tool can produce multiple components of various shapes and sizes to minimise wastage. Nowadays industrial plastics have assumed irreplaceable part of automobiles. Designers can go for optimum and aesthetic shapes if backed by an intelligent Tool-Room.

Cost competitiveness through tooling: When margins are low and the bottom line is through volumes, a better set of tooling brings in the advantage of cost competitiveness. Innovative ideas like multiple cavities, reduction in number of operations, combining as many operations as possible, reducing machining allowances etc., bring in cost competitiveness.

Importance of precision tooling cannot be understated in eliminating wastages, improving productivity, reducing cost and enhancing quality. One of the key factors for the above benefits is well designed and manufactured tooling.

Many cost reduction ideas through better tooling could not be practiced due to lesser volumes produced by manufacturing industries, whereas present volumes permit the manufacturers to tap the potential of reduced cost of production through investment in tooling. For example, drilling of sheet metal items like automobile chassis, brackets, etc., is replaced by punching, which results in productivity improvement of more than 300 per cent per cent. This advantage is apart from better and consistent quality. Similarly, fine blanking and pressure die casting reduce the cost of machining to almost nil. Modern forging practices enable the designers to reduce the weight of components by about 16 per cent per cent. Advances in injection moulding tooling have made possible complicated shapes to be moulded reducing the number of parts required.

Example: To reduce man hours required for manufacturing, improved tooling is designed for component plate. This tooling introduction has reduced the operation from the original six to three, thereby improving the productivity by about 180 per cent per cent. This also involves an investment for tooling which is justified by saving through higher volume.



BEFORE TOOLING

Marking
Drilling
Gas cutting
Chipping
Grinding
Painting

AFTER TOOLING

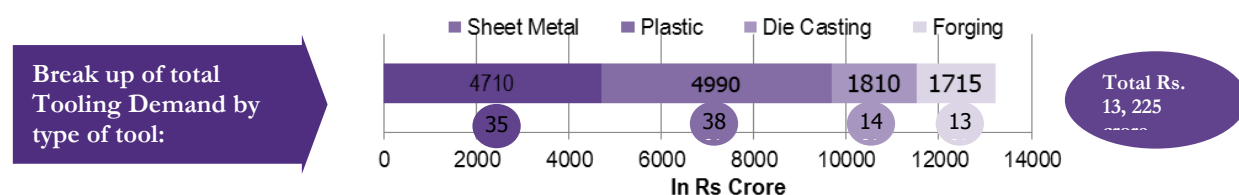
Punching
Grinding
Painting

TDM Demand

With the type of growth projected for various manufacturing industries within the category of tool users, a great variety of TDM is required for both; metallic and non-metallic components involving casting, forging, machining, pressure die casting, welding, injection moulding, etc. These processes require appropriate tooling to meet the quantity and productivity norms. Following table presents types of tooling along with end user segments:

Tooling	Tool Types	End User Segments
Sheet Metal Dies	Simple, Combination, Progressive & Transfer	• Automobiles Industry • Auto Components Industry • Tractor Industry • Consumer Appliances Industry • Plastic Moulding Industry • Electronics Industry • Electrical Equipment Industry • Packaging Industry • General Engineering Industry
Plastic Moulds	Injection Moulds, Blow Moulds & Compression Moulds	
Die Casting Dies	Die Casting	
Forging Dies	Hammer, Press, Open & Closed Forging Dies	

As estimated by Tool and Gauge Manufacturers Association of India (TAGMA), the total tooling demand stands at Rs.13,225 crore. The segment-wise break up of tooling demand is as follows:



Source: TAGMA

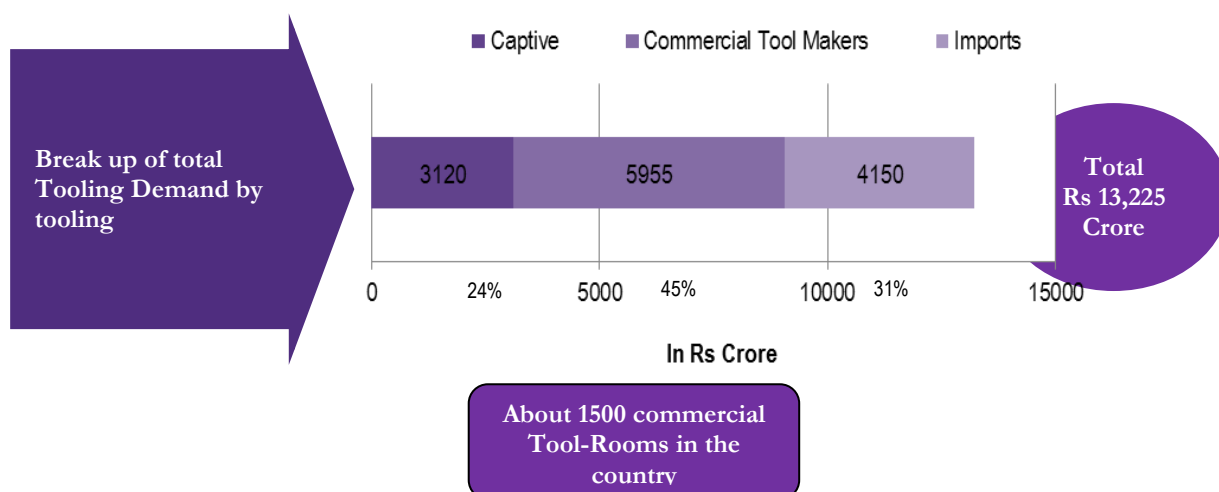
Main Sources of TDM

Generally tooling required by the manufacturing sector are made in captive Tool Rooms of the manufacturers, imported or outsourced to commercial Tool-Rooms. The Commercial Tool-Rooms usually specialise in particular type of tooling which gives them edge over others particularly in specialised tooling. There are about 1500 commercial Tool Rooms in the country of various sizes⁶. Captive Tool-Rooms mushroomed as the capacity & capability in commercial Tool-Rooms is limited, moreover, captive

OEMs are using the increasing global competition in the TDM sector in the re-shaping of their supply chain practices. Globally, customers are increasingly using the expertise of mould makers in the West to design and engineer the mould and then giving that intellectual property to companies in Asia, and especially China, to produce the tooling at lower cost. The OEMs are becoming more aggressive in demanding annual price cuts from their suppliers. Suppliers are expected to achieve cost savings by reengineering components, finding cheaper material or coming up with simpler designs. Similar pressures are also being experienced by the suppliers of tooling to the automotive industry. As industry pointed out, supplier prices are increasingly measured against 'world prices' (usually meaning China) for an equivalent product.

⁶ Indian TDM Industry report 2011 – TAGMA Publication

capacities are required for repairs and maintenance of tools outsourced. Whenever tooling is not available from commercial Tool Rooms or they are beyond the capability of captive Tool-Rooms, manufacturers import them.



Imported Tooling: Typically imported tooling used to be very special in nature involving intricate machining and very good finish. Normally body panels of four wheelers and two wheelers fall in this category. Sometimes when the collaborator or foreign investor transfers models which are running successfully abroad, corresponding tooling is also transferred. This makes the fine tuning and trials easier. However, life of such tooling equipment is limited as they have already produced considerable number of vehicles abroad before being transferred to India. Usually these tools are made fresh in India for volume increase after their original tool life is expended. This depends on the capability of Tool-Room to match the quality level of imported tools.

In some instances, during the development itself a close interaction is maintained with the tooling supplier abroad so that the lead time is reduced as much as possible. Tooling suppliers from abroad are able to offer quality and finish due to their vast exposure in the field of making tools. Drawback of these types of tools is non-availability of spares at reasonable cost. It is also felt that information on material is not shared by the tooling supplier abroad.

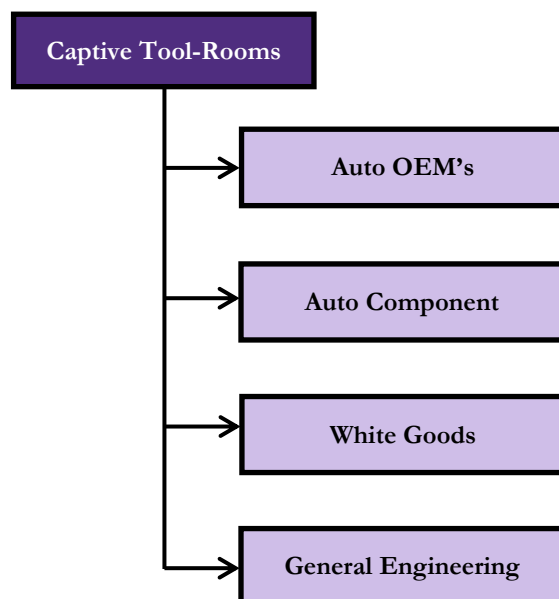
In the present trend of producing automobiles for global market, foreign investors are particular about tooling coming from their own suppliers abroad to meet the international standard. In any case imported tooling has become the part of manufacturing due to their shorter lead time, advanced technology, better finish, longer life due to better material etc. Imported tooling is preferred in many cases due to above reasons in spite of higher initial cost and parts availability in the future. Imported tooling are mainly used by OEMS and large Tier I manufacturers.

One of the most important changes with regard to TDM imports has been a significant increase in global competition driven largely by the emergence of China as a low cost producer. While still lacking the sophistication and creativity in tool design to design and produce high precision complex machine tools and moulds, China is rapidly moving up the value chain with a low cost, skilled labour force. Moreover, by running machinery 24 hours a day, seven days a week, delivered prices are 30-75 per cent below those of North American producers.

Captive Tool-Rooms: Captive Tool-Rooms are in-house facilities created by large- and medium-scale enterprises for their tooling requirement. The lack of capacity and capability in the commercial Tool-Rooms; and demand from OEMs to demonstrate tooling capability led to the increase in captive Tool-Rooms. The large- and medium-scale companies from segments like Auto

Component, Plastic, and Wide Goods etc. have developed their own Tool-Rooms. Large scale companies like Mahindra & Mahindra, Tata Motors, JBM Auto, etc., have extremely sophisticated state-of-the-art equipment in their captive Tool-Rooms and capable of producing all their requirements. Smaller captive Tool-Rooms are meant for repair and maintenance work.

However, the feedback from the industry including large scale Tool-Rooms with JBM, Motherson Sumi, etc., is that it is not viable any longer to have captive Tool-Rooms and accordingly they offer their spare capacity for commercial use e.g., the Tool-Room with JBM offers almost 50 per cent per cent of its capacity for commercial use.



Captive Tool-Rooms	Number of Companies	Average Number of Employees per Company
Large Scale CTRs	100 to 120	100 to 120
Medium Scale CTRs	800 to 900	35 to 45
Small Scale CTRs	400 to 500	10 to 15

Commercial Tool-Rooms: Commercial Tool-Rooms are of following types:

- Large Commercial Tool-Room
- MSME Commercial Tool-Room
- **Large Commercial Tool-Room:** These are well equipped with machines for all types of operations. Many a times they also have Heat Treatment facilities for better control of metallurgical properties. Tool-Rooms like Sridevi, NTTF, Indo German and Indo Danish Tool-Rooms fall in this category. Large Tool-Rooms also offer designing assistance to all their clients.

Commercial Tool-Rooms have the advantage of lower costs compared to imported tools. The availability of spares is easier and cheaper with Commercial Tool-Rooms. Many Commercial Tool-Rooms assist clients until the tooling is established. Commercial Tool-Rooms can supply a substantial quantity of blanks through wire cut method before blank configuration is finalised. Large commercial Tool-Rooms undertake training of the operative personnel and maintenance personnel in the interest of the tool life and quality.

Technological innovation remains a constraint until large Commercial Tool-Rooms have tie up with or interaction with Tool-Rooms abroad. Nowadays with Tool-Rooms gaining importance

investment is also increasing in large Tool-Rooms. Generally a modern Commercial Tool-Room is well equipped with good measuring facilities.

Tool-Rooms in this category sometime specialise in particular type of tooling like press tools, injection moulding tools etc. Some tooling companies specialise in making gauges such as plug gauge, snap gauge, receiver gauge etc. A typical example is Accurate Gauges Ltd in Pune.

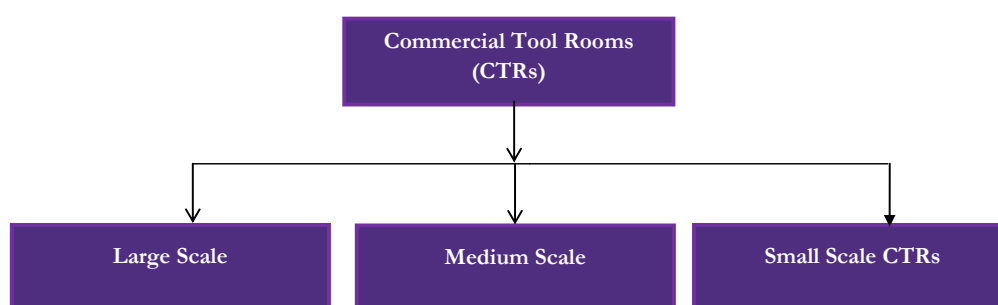
- **MSME Tool-Room:** This category of Tool-Room is an important link in the tooling chain in the auto industry. Generally MSME Tool-Rooms cater to local area customers. Investment involved in MSME Tool-Rooms is less and any intricate machining is outsourced to specialised Tool-Rooms. Invariably heat treatment operations are outsourced. In some of the industrial clusters, MSME Tool-Rooms have mushroomed e.g. Aurangabad, Mumbai, Ludhiana, etc.

MSME Tool-Rooms – Common Challenges

- Lack of investment in testing and try out facilities
- Manpower is mainly trained on-the-job with limited or no formal training
- Lack of capital prevents acquisition of precision machines
- Use of pirated software and simulation packages

The biggest shortcoming is the non-availability of technology and contemporary ideas. However, they are quite handy in supplying conventional tooling at reduced cost and much faster than large Tool-Rooms. MSME Tool-Rooms struggle to retain trained workforce. Servicing of older tools is an added convenience from MSME Tool-Room. Some of the MSME Tool-Rooms take up tool regrinding or reconditioning of tooling to augment their revenue. Some of the MSME Tool-Rooms have facilities to calibrate gauges on chargeable basis.

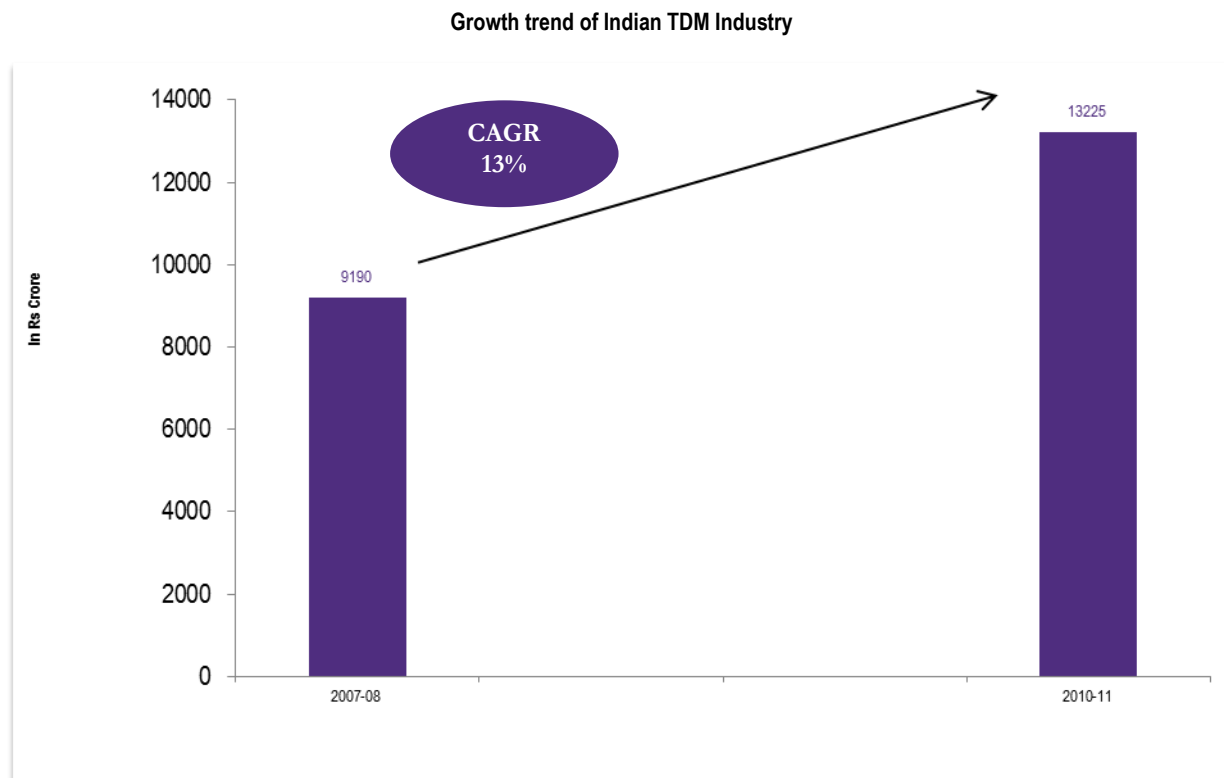
The details of Commercial Tool-Room segment are given below:



Past growth trend in the TDM industry

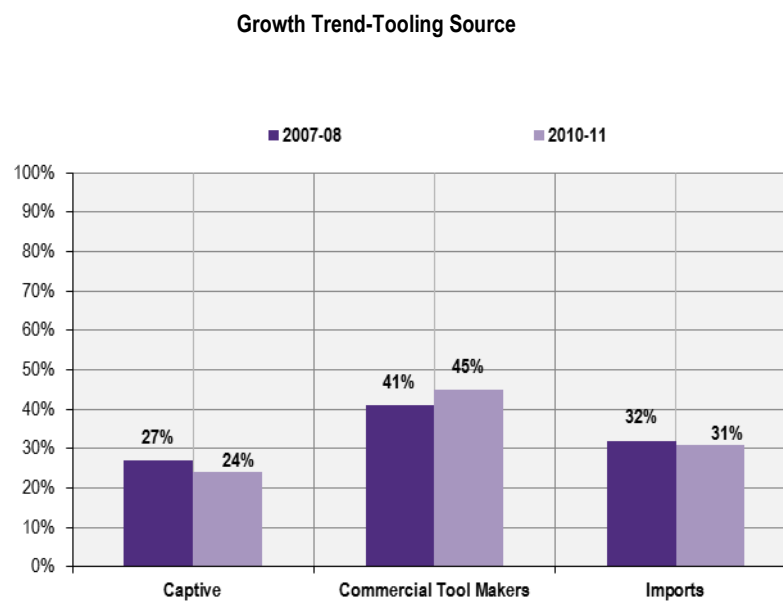
Commercial Tool-Rooms	Number of Companies	Sales Turnover (In Rs. Crore)	Average Number of Employees per Company
Large Scale CTRs	20 to 25	Above 35	120 plus
Medium Scale CTRs	120 to 150	10 to 30	50 to 70
Small Scale CTRs	1000 to 1100	Up to 10	25 to 35

Over the past three years, the TDM industry has grown at CAGR of 13 per cent from Rs.9190 crores in 2007-08 to Rs.13,225 crores in 2010-11.



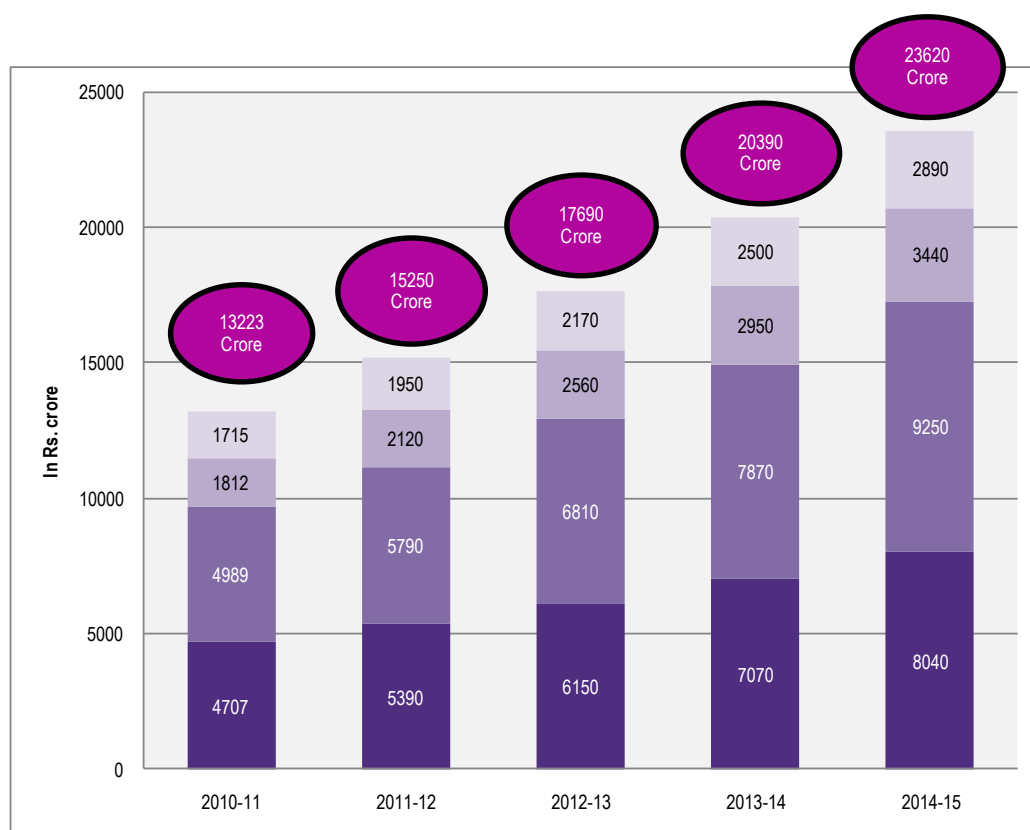
Source: TAGMA

The share of imports, captive and commercial Tool-Rooms is given in the following graph. As illustrated, the share of commercial Tool-Rooms has increased as the share of imports and captive Tool-Rooms has come down.



Growth Projections in TDM

Given that the major TDM user sub sectors are likely to have double digit growth over next 4 to 5 years led by Auto Components, Plastics, Electrical Goods, etc., there is going to be a significant growth in the demand for TDM. As per the recent study conducted by TAGMA, the total TDM demand in 2014-15 is expected to reach Rs.23,620 crores. The estimated growth over the next few years is given in the following graph:



TDM Industry Growth – Essential to Support Manufacturing GDP

As established in the foregoing paragraphs, the target of increasing the manufacturing sector GDP to 25 per cent will depend on the competitiveness of the sector which in turn depends heavily on the TDM industry for innovation and cost competitiveness. Further, to match the growth in the user sub-sector growth, the turnover of TDM industry is required to increase by about Rs.10,000 crores over the next five years. While the increase in the demand for TDM and the growth in upstream industries is well established, the actualisation will face many challenges which are highlighted below:

- **Additional Investment of more than Rs.10,000 crores:** To meet the envisaged growth the predicted investment required in the TDM industry is approximately Rs.10,000 crores⁷ and almost 50 per cent of this would be used in the commercial Tool-Room segment.
- **High Technology Obsolescence:** The TDM industry has very high level of technology obsolescence with new technologies fast replacing the older ones. Over the last five years technologies have changed significantly; CMM from touch probe to Laser probe and VMC from access motor pulse operated to linear motor.

⁷ As per Industry norms, an investment of Rs 1 crores in tooling equipment leads to additional turnover of Rs.1 .5 crores however 1:1 investment to turnover ratio is considered appropriate for Tool-Rooms with testing and allied infrastructure.

1.
 - **Low returns on investment:** The average ROI in the TDM industry is 15-17 per cent which is not very attractive for new investments. Feedback from the industry is that investments have low returns and viability concerns are usually high for captive Tool-Rooms.
 - **Lack of skilled manpower:** The TDM industry employs about 1,20,000 persons in commercial and captive Tool-Rooms. It is estimated that over the next five years the additional manpower required by the TDM industry is approximately 75 – 80,000 skilled workers. The major sources of supply of skilled manpower are the Government Tool-Rooms, NTTF and few polytechnics. The existing workforce with the MSE Tool-Rooms is mostly trained on-the-job without formal training; they need to be upgraded through formal training programmes.
2. **Technology and Process Upgradation:** Most of the commercial Tool-Rooms are in the MSE segment, with limited resources to invest in sophisticated machines. Usually MSE Tool-Rooms go for cheaper machines against more sophisticated European machines. The difference is highlighted in the table below:

Skill Gap

The National Sample Survey results show that among persons of age 15–29 years, only about 2% are reported to have received formal vocational training and another 8% reported to have received non-formal vocational training indicating that very few in the workforce enter industry with any kind of formal vocational training. Adding to this is the unorganized sector which constitutes about 93% of the workforce and is not supported by any structural Skill Development and Training system of acquiring or upgrading skills. By and large, skill formation takes place through informal channels like family occupations, on-the-job training under master craftsmen with no linkages to formal education training and certification. This proportion of trained youth is one of the lowest in the world. The corresponding figures for industrialized countries are much higher, varying between 60% and 96% of the youth in the age group of 20–24 years.

Taiwanese	European
Meet German or Japanese standards for precision at the time of installation	Meet those standards throughout life
Poor on calibration systems	Inbuilt high tech calibrations systems
Low cutting speed	High cutting speed – 3 to 4 times higher
Poor finishing	High quality finishing
High vibrations which leads to loss of precision over time	Low vibration, precision lasts much longer.
Example – 3 Axis Machine with the specifications	1mt X, 0.8 mt Y and 0.6 mt Z
Cost = Rs 25 lakhs Indian or Taiwanese = 4 tonnes	Cost = Rs 70 lakhs German = 15 tonnes

Furthermore, the TDM industry especially the MSE Tool-Rooms are not aware of the latest manufacturing and management concepts. Industry needs to upgrade its processes, removing costs from the tooling process from design to manufacture using lean principles, including lean design, streamlined inventory and process innovation are the recommended ways forward. There is a need to focus on shorter faster lead times, 3-shift operations, tool-standardisation, right-first time and right-first part.

Section C – Performance of MSME Tool-Rooms

1. Policy Goals

Origin

Importance of tooling in the manufacturing industry has been brought out in the above sections. It is an important input to increase productivity, incorporate precision and reduce costs. It is a significant contributor to lean manufacturing. It is needed by one and all, whether micro, small, medium or large units. Large houses could afford and own their captive Tool-Rooms but others could not afford it on their own and depended on commercial Tool-Rooms which were very few. Private sector was not so keen to invest and set up commercial Tool-Rooms due to low return on investment, high cost of capital and high technology obsolescence. This triggered off the decision of public support in tooling as a specific instrument in addition to other numerous promotional measures for development of small scale industries.

The idea to operate Government Tool-Rooms emerged in India in 1960s. The first such Tool-Room, Central Institute of Tool Design was set up in Hyderabad in the state of Andhra Pradesh, under United Nations Development Programme. It was the time when industrialisation was making a significant headway and the Government of India wanted to promote, rather protect small scale industries for which it had set up Small Industries Development organisation (SIDO) as a unit of Ministry of Industry, in 1952. CITD was therefore set up as a field office of SIDO. It was later converted into a society to provide greater autonomy, starting its operations in 1969. Its success led to demand from other states for similar projects. Tool-Room projects needed huge investments and more expertise in design and manufacture of tools which is a unique area in mechanical engineering. Government therefore looked for assistance under bilateral and multilateral development programmes and strength of Government Tool-Rooms grew. Projects were set up both under central and state Governments. This report deals with central Government controlled Tool-Rooms set up as below:

- **Under United Nations Development Programme**
 - Central Institute of Tool Design, Hyderabad
 - Central Institute of Hand Tools, Jalandhar
- **Under Indo-German Technical Co-operation Tool-Room Programme**
 - Indo-German Tool-Room, Ahmedabad
 - Indo-German Tool-Room, Aurangabad
 - Indo-German Tool-Room, Indore
 - Central Tool-Room, Ludhiana
- **Under Indo-Danish Technical Co-operation Tool-room Programme**
 - Central Tool-Room and Training Centre, Bhubaneswar
 - Indo-Danish Tool-Room, Jamshedpur

- Central Tool-Room and Training Centre, Kolkata
- **Without External Assistance**
 - Tool-Room and Training Centre, Guwahati

Collaboration between the Governments under Indo-Danish Tool-Room Programmes concluded on 31.05.2001 and that under Indo-German Tool-Room Programme on 31.3.2003 except for CTR Ludhiana where it continued upto 30.9.2003 to provide support to the newly established Rapid Prototyping Centre.

Rationale

In the post-independence era, the Government of India had undertaken industrial development programme for the development of the Indian Industry. Development of small scale industrial units was an important feature of its industrial policy. In addition to fiscal incentives, reservation of certain products for exclusive manufacture in small scale sector development of infrastructure conducive to the development of the industry particularly small scale sector was needed. Availability of proper tooling and skilled manpower were two of the most important issues.

As the Indian industry developed there was phenomenal growth in the requirement for better tooling and skilled manpower. Indian economy was not in isolation from the developments taking place all over the world. As the competition became more complex, propelled by the overall economic buoyancy, industrial aspirations arose. To meet these aspirations, be it the basic need of the toy for the child or the complex part of an automobile; forward technology held the key. High-precision dies, moulds and other production aids were needed. There was also a phenomenal changeover of materials for different components from metals to plastics. The application of plastic moulds was therefore widening. All this necessitated the development of tooling infrastructure. The Government of India therefore planned institutional support in the area of tooling.

Besides, tool-making as a vocational trade has faced shortage all over the world and this is a continued scenario even today, in both developed and developing countries. In India, there was and is shortage of trained tool-makers and therefore, avenues for training tool-makers were needed.

In accordance with the provision of Micro, Small & Medium Enterprises Development (MSMED) Act, 2006 the Micro, Small and Medium Enterprises (MSME) are classified in two Classes, manufacturing and service enterprises. The criterion applied is investment in plant and machinery for manufacturing enterprises and in equipment for service enterprises. The limits are as under:

Enterprises	Investment in plant and machinery
Micro	Does not exceed rupees twenty five lakhs
Small	More than rupees twenty five lakhs but does not exceed five crores
Medium	More than rupees five crores but does not exceed rupees ten crores

The development of infrastructure for tool design and manufacture as well as training of tool-makers was needed. It needed advanced equipment and expertise. The Government of India therefore looked for technical co-operation both under bilateral and multilateral programmes and the Tool-Rooms mentioned above were established. These Tool-Rooms were mandated to provide production related services primarily to small scale industries while the concept of micro and medium scale industries was added later on.

From the investments needed and the above classifications it can be inferred that it is impossible for a micro unit to have its own tool-making facility. A Small unit can, at best, have

its own tool maintenance section for minor repairs but still depends on commercial Tool-Rooms for major repairs and modifications. Medium scale units can have tool shops to manufacture simple dies and moulds, however, need commercial Tool-Rooms for tools involving complex shapes that need higher than 3D machining and accuracy of 7 microns or better. Reluctance of private sector to invest in commercial Tool-Rooms was the reason which formed the basis for setting up Government Tool-Rooms

Irrespective of the institutional set-up, their technical features are more or less alike deviating from one another only as a consequence of the particular demand pattern of the local industries, in features of providing services like vacuum heat treatment, rapid prototyping, plasma nitriding etc. In terms of physical dimensions and weight, they all tend to cover medium range tools. Of late, with the development of automobile industry, some Tool-Rooms are adding equipment to cover higher ranges.

Aims and Objectives

All the 10 tool-rooms are set up under MoMSME, Development Commissioner MSME, primarily to promote MSMEs. Aims and objectives for setting up the 10 tool-rooms, therefore, tend to be similar and directed to be an instrument to improve the competency of MSMEs. The aims and objectives, inter alia, are as below:

- To increase the efficiency of small-scale units in the Northern Region in light engineering and allied fields by providing support in the design and production of tools and jigs & fixtures as well as by rendering technical consultancy services
- To manufacture small and medium-size tools such as press tools, jigs & fixtures, moulds, dies, and special purpose tools
- To provide common service facilities to small-scale industries regarding the manufacture of various types of tools, heat treatment, and related services
- To impart long-term technical training in the form of Diploma, Certificate course in Heat treatment and condensed courses to students who want to become toolmakers, technicians in the plastic and metal processing industry or heat treatment specialists
- To conduct short-term and part-time courses for technical staff of small-scale industries putting emphasis on advanced technologies such as CNC programming and machining and CAD/CAM, but also offering training in conventional subjects

Change in environment

Manufacturing activity has undergone a radical change over the course of the last 20 years. = Rapid changes are certain to continue. Manufacturing will remain one of the principal means of creating wealth. It is essential that India be prepared to implement advanced manufacturing techniques in a timely manner. The important technical, political and economic forces which will influence manufacturing are mentioned below:

- Intense competition, enhanced by means of sharing knowledge, will require rapid response to market needs
- Demanding customers will want products that are customised to meet their requirements
- Emergence of new manufacturing technologies
- Innovation
- Environmental issues emerging from demand for protection of global ecosystem
- Vanishing trade barriers
- Reducing product lives
- Frequent additions of new models, especially in automobile and home appliances sector
- Cost cutting by OEMs
- Global distribution of production resources, including skilled workforce

Tools will play an important role in the changing scenario of manufacturing activity. It is the tool which gives final shape and precision to the components. Competition will require faster means of

production at reduced costs. Advancements in tool designs can increase productivity by combining manufacturing operations. Increased number of cavities in plastic mould produces more number of components in each stroke of the machine. Mould design skills are needed to add complex features on moulded parts from the same moulding machine, facilitating innovation. Compound, combination and progressive dies yield similar gains in case of sheet metal parts. Changing manufacturing scenario will call upon tool designers and tool makers to make commensurate advances in their areas.

Responding to the change

Tool-makers face the challenges ahead to respond to the changing manufacturing needs. They will have to produce what has come to be known as 'world class tooling'. World class tooling incorporates the following:

Competitive cost: While cost was the main criteria for tool buyers until a few years back, in the changed scenario, it is the competitive cost. Priority in decision making has shifted to quality and delivery times and cost has to compete after meeting these criteria. Expectations are a partnership between the tool-maker and the customer. Customer should be comfortable with the cost he is paying and the tool maker's margins should be enough to reinvest in latest technology, and thereby continue to offer competitive costs to the customer.

Aggressive lead times: Tool-makers have the hardest job in launching new projects, from conception, design, manufacture of tooling, to trials and establishing production. Tool-makers will always be under pressure to reduce lead times and should be careful not to fall into the trap of making promises that cannot be kept. Customers will be more realistic and flexible in timing plan. It is due to the fact that more and more customers are running projects using concurrent engineering to reduce the time to market.

Right first time: Utopia is for tool-makers to produce tools, which in turn produce correct components in the first trial and go into production immediately. But tool-makers have to drastically reduce the time gap between completion/ assembly of tool and running production with it. Simulation software and precision manufacturing technologies would assist a tool-maker in this regard. Customers do not want to see leaking coolants, seized ejectors or flash at parting lines once tools arrive at their production lines.

Guaranteed tool life: Tool maker has to assess a tool's life and indicate a reasonable estimate of components his tool is going to produce. Tool life also depends upon the usage which has to be taken care of by the user. But once a tool arrives at the production shop, production plans have to be adhered to and normally no time is provided to carry out any major modifications or refinements at that stage. A well designed mould made from quality tool steels and used with proper maintenance routine should give about one million shots. Tool cost and quality should reflect this expectation.

Can do attitude: Buyers expect a tool maker to have a "can do" attitude. This means that if a problem arises during tool manufacturing, tool maker should offer various suggestions to solve the problem. In today's manufacturing environment of concurrent engineering the, "can do" attitude has become the norm and not the exception.

Customer constraints: Constraints on customer influence where the order is placed. After meeting the expectations with regards to quality, delivery and price, these constraints are location, ease and cost of visitation to the tool maker, language, ease of parties to understand each other and, if another country is involved, procedures for exportation, money transfer, taxes and political stability of the country of tool maker. Even after reaching buyer's expectation of quality, delivery time and price, if constraints on the buyer are too great, tool maker should not hope to win any business.

How world class tooling is measured: Tool buyers carry-out the assessment of tool-maker by examining his facilities, standard operating procedures, past lead time achievements, past experience, financial strength and organisational and management policies. If the tool maker scores an acceptable mark, he is listed. Test orders are placed on him. He is retained on the tool suppliers list of world-class tooling if the tools from him arrive on schedule or earlier, if its cost does not upset the planned budget and it goes into production without any delays on arrival at production facility.

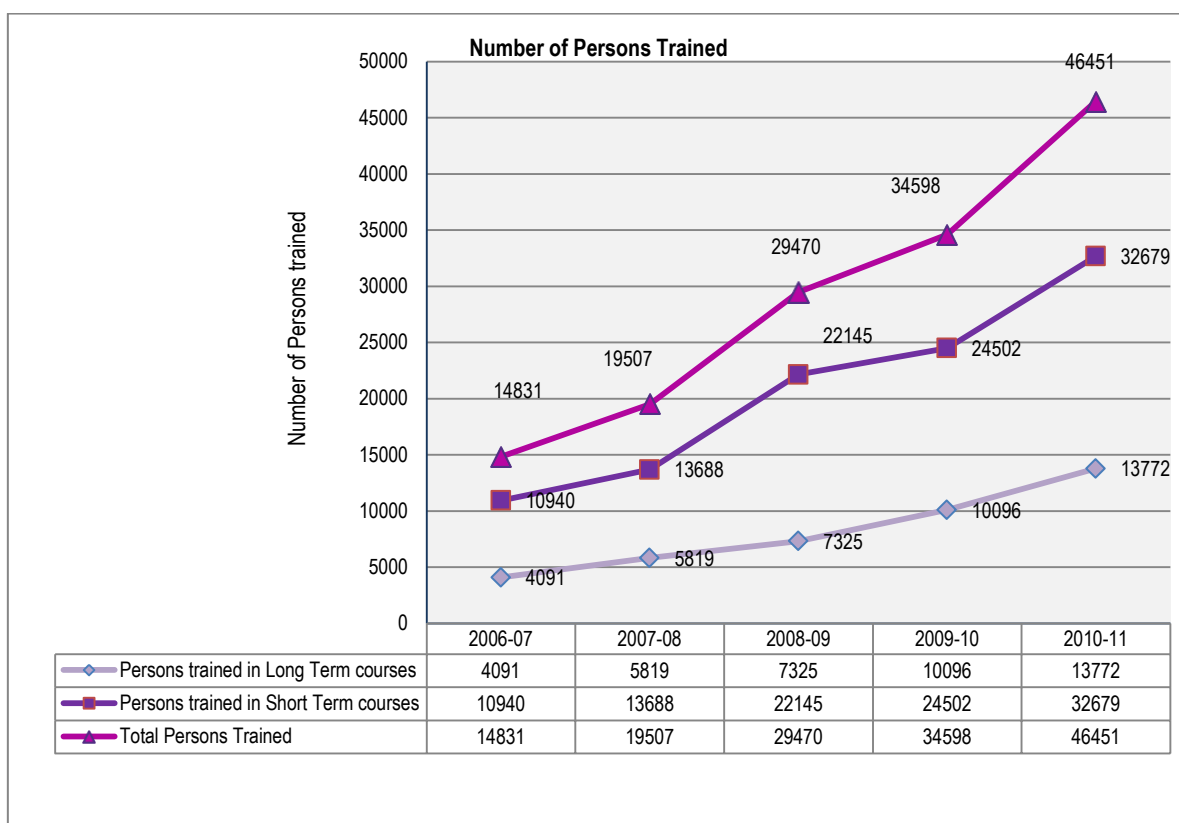
2. Strategic Assessment

Grant Thornton undertook an elaborate exercise to assess the performance of the 10 Tool-Rooms. The assessment has been carried out considering the MSME context, the strategic objectives with which the Tool-Rooms were established and the impact they have achieved against those objectives. The assessment covers past performance over the last 5 years and also tries to bring to light the factors which contributed to the performance. An attempt is also made to understand the factors which are common and those that are specific to each Tool-Room.

A detailed assessment of each individual Tool-Room has been carried out that is available as separate Individual As-Is Assessment Reports. Following paragraphs summarise the combined performance of the Tool-Room programme of the MoMSME and subsequently look at the cross cutting factors that drive the performance.

2.1 Past Performance: The combined performance of 10 Tool-Rooms is as follows:

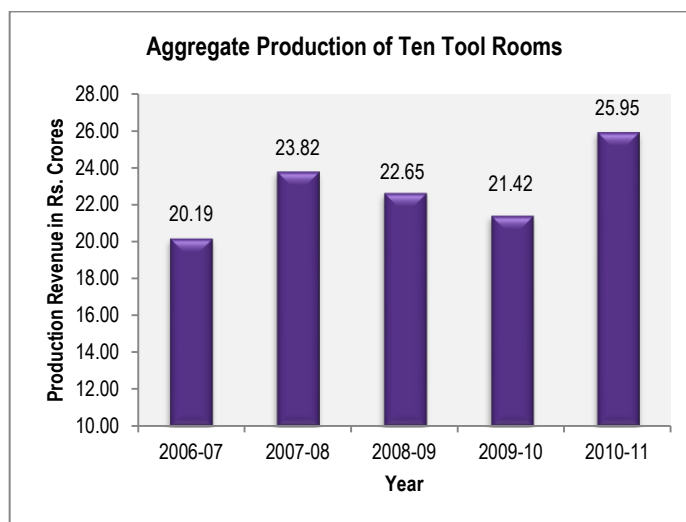
a. Training Output:



There has been steady growth in the training output from the Tool-Rooms. The training output has increased by more than 300 per cent over the last 5 years and increase has been similar in both short and long duration courses. In terms of absolute numbers, the share of long-term courses is 30 per cent and balance is contributed by the short term courses.

Both the programmes achieve significant objectives, the long term courses directly bridge the skill gap in the Tool-Room segment which requires additional 90,000 skilled persons while the short-term courses usually enhance the skills of engineering students and existing workers. There is need to increase the share of long term programmes considering acute shortage of skilled persons in the engineering sector.

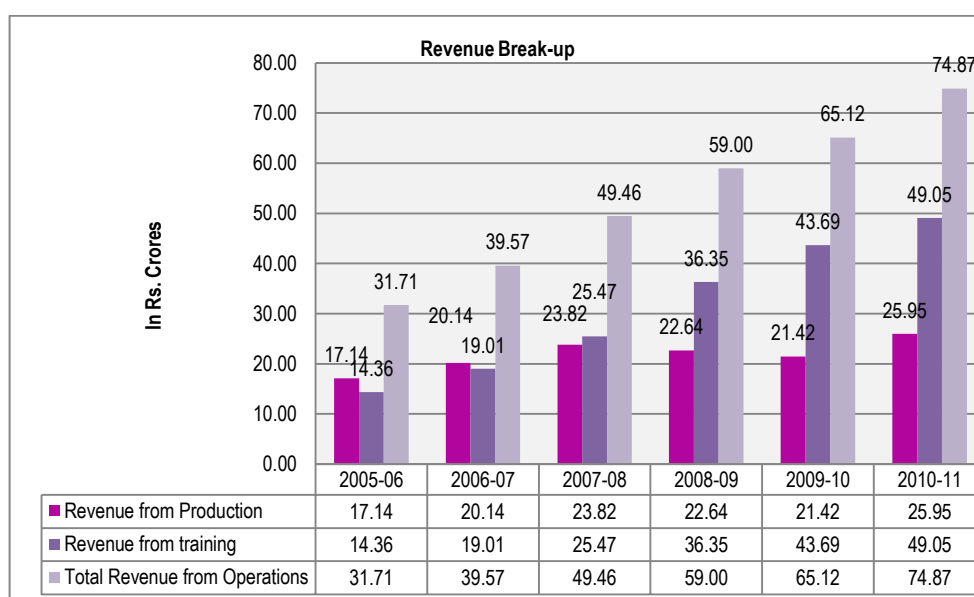
b. Production/ Tooling Output



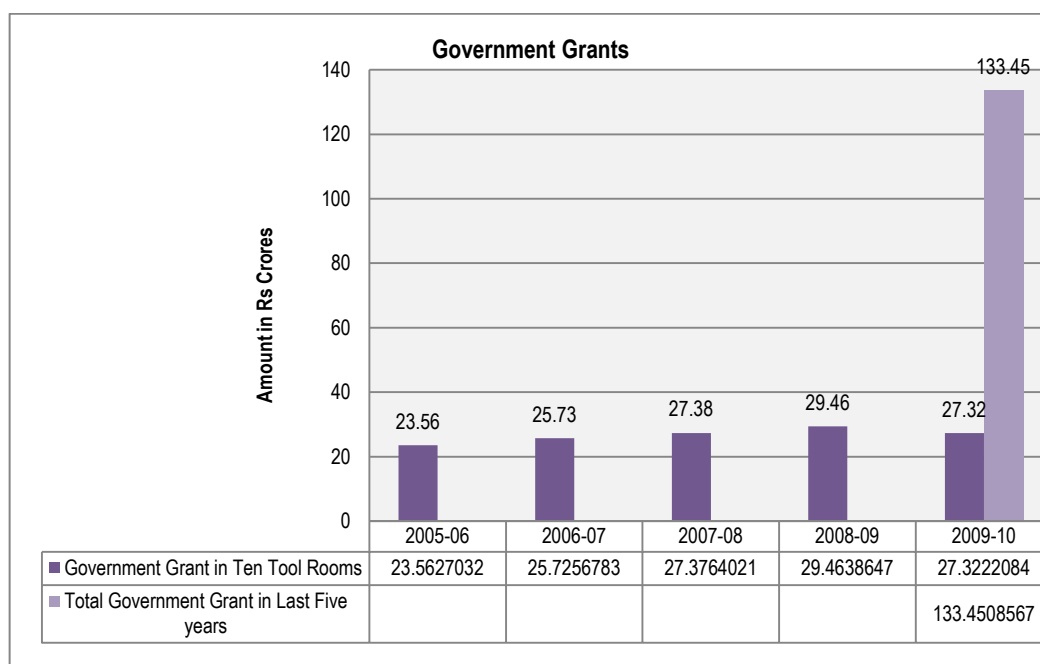
The production output has not grown significantly over the years; it was Rs.20 crores in 2006-07 and increased only by 30 per cent in 5 years to about Rs.26 crores last year. Further, significant share of production is from component production/ job work for large scale units and PSUs which is good for revenue generation but does not contribute towards strategic objectives of the Tool-Room programme. Moreover, given the significant capital investments in the tooling infrastructure, the output is indeed minuscule.

Considering that the total tooling market is approximately Rs.13,225 crores with almost 70 per cent being produced in captive and commercial Tool-Rooms, there is significant capacity which is generated in the private sector. As explained in the initial chapters, majority of the 1500 commercial Tool-Rooms in the private sector are in the MSE segment requiring assistance for upgradation. In this context, there is merit in shifting focus of MoMSME Tool-Rooms from competing with private Tool-Rooms to becoming a catalyst for the upgradation of these private players.

c. Revenue Growth and New Investments⁸

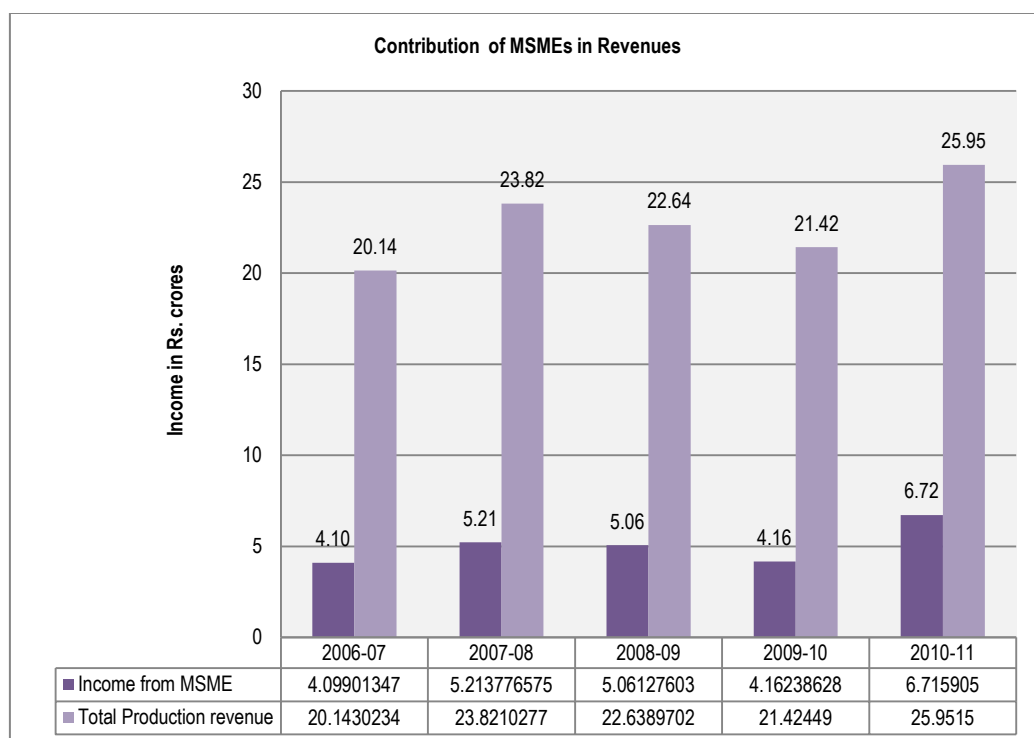


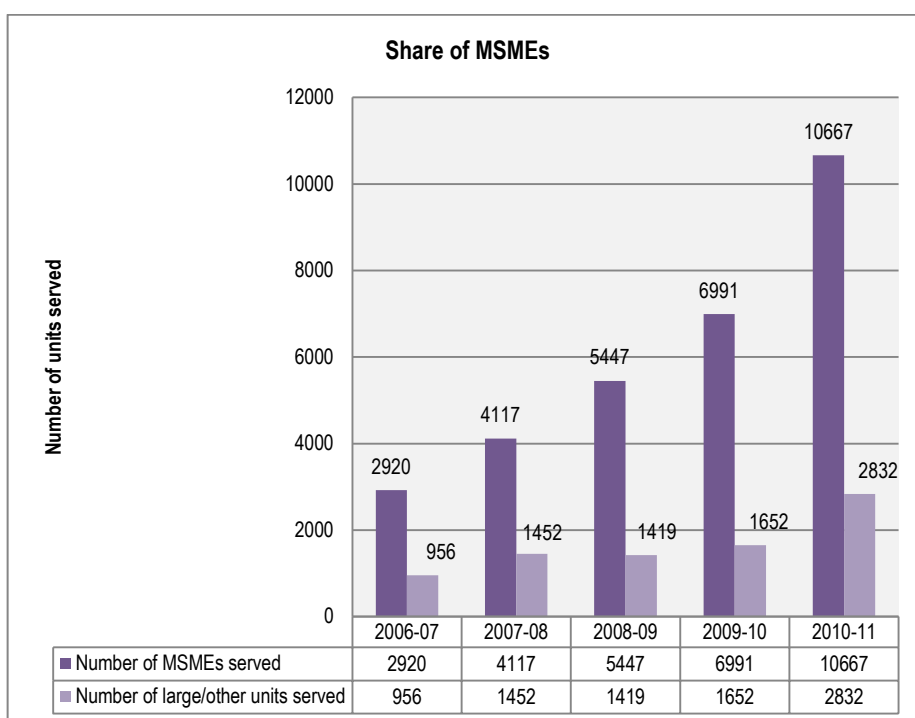
⁸ Gross Block: The total value of all the assets that the tool rooms own.



There has been steady growth in revenues from the Tool-Rooms with training revenue exceeding the production revenue significantly and also growing at a faster rate over the last 6 years. However, considering that the total gross block of Tool-Rooms is Rs.513 crores, the total revenues of Rs.74.87 crores are very low. There is significant new investment of Rs.133 crores at an average of more than Rs.25 crores over the last 5 years but the increase in revenue are incremental only.

d. MSMEs Benefited





As evident from the above graphs, the share of MSMEs in total revenue of the Tool-Rooms is 26 per cent in the last year which is up from 20 per cent in 2006-07 while there is significant increase in the number of MSMEs served. At 26 per cent of revenues, the total value is Rs.6.76 crores which is contributed by 10,667 MSMEs at an average order value of Rs.6000 indicating that majority of MSMEs users are not using tooling services but testing and quality assurance services or minor machining or heat treatment facilities. One Tool-Room reported to have assisted 2902 MSMEs in 2010-11, which works out to be 10 units per working day. In that short time a significant assistance cannot be provided. It will be appropriate if value of assistance in monetary terms, assessment of technological assistance in terms of increase in productivity, decrease in rejection, new products developed etc., is monitored.

e. Self-Sustainability

Financial Sustainability (With and Without Depreciation)												
	2006-07		2007-08		2008-09		2009-10		2010-11		All five years	
	With out	With	With out	With	With out	With	With out	With	With out	With	With out	With
IGTR Ahmedabad	√		√		√		√		√		√	
IGTR Aurangabad	√		√		√		√		√	√	√	
IGTR Indore	√		√		√				√			
CTR Ludhiana	√		√									
CTTC Bhubaneswar	√		√	√	√	√	√	√	√	√	√	
IDTR Jamshedpur	√		√		√		√		√		√	
CTTC Kolkata												
CITD	√		√		√		√		√		√	

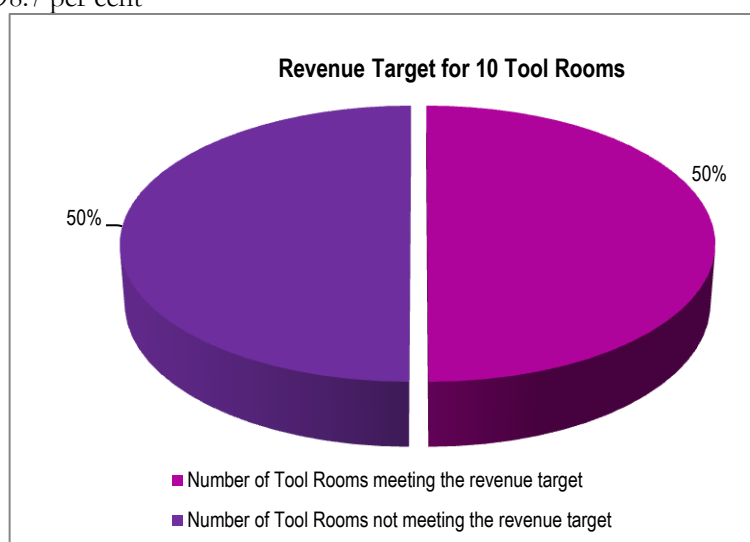
Financial Sustainability (With and Without Depreciation)												
	2006-07		2007-08		2008-09		2009-10		2010-11		All five years	
	With out	With	With out	With	With out	With	With out	With	With out	With	With out	With
Hyderabad												
CIHT Jalandhar												
TRTC Guwahati					√		√		√			

While there are 5 Tool-Rooms which have been consistently achieving cost recovery without depreciation, there are only two – Aurangabad and Bhubaneshwar Tool-Rooms which have achieved full cost recovery including depreciation.

f. Target achievement in FY 2010-11

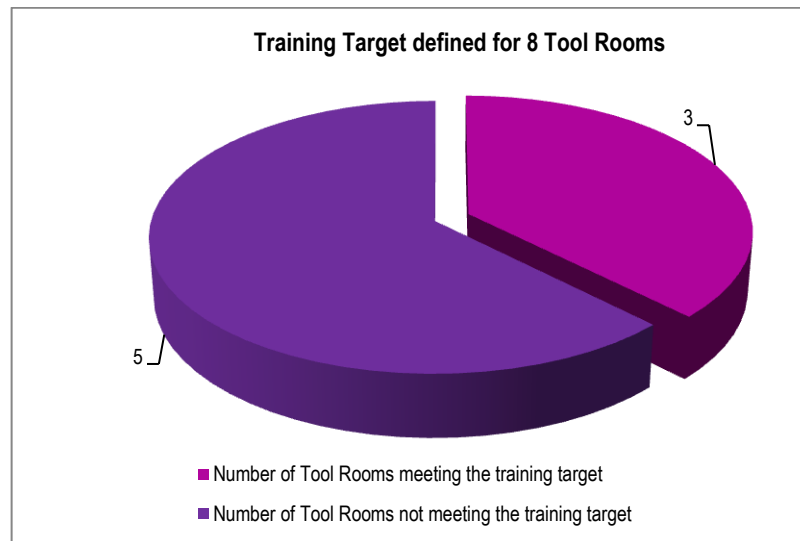
Achievement of Revenue Target

Combined target, both for training and production, has been defined for all the Tool-Rooms, out of which only five Tool-Rooms have achieved the target. Cumulative target achievement for all the Tool-Rooms is 98.7 per cent



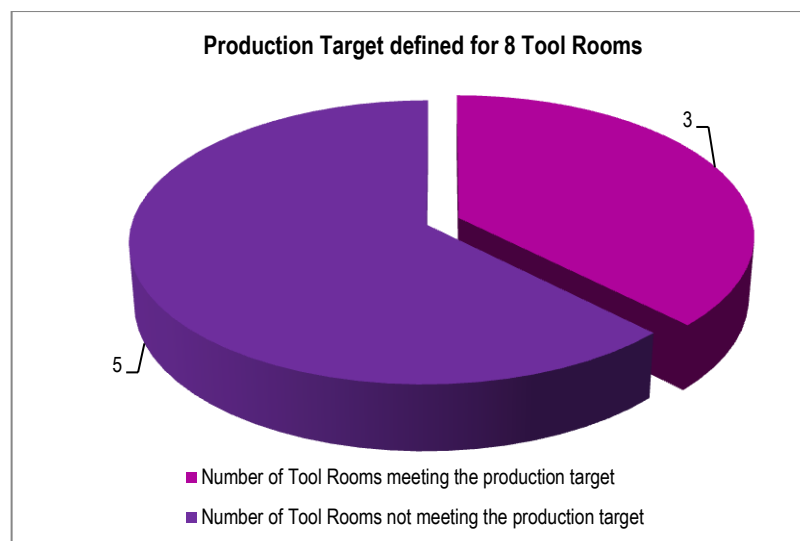
Achievement of Training Target

Separate training target has been defined for 8 Tool-Rooms (except for IGTR Ahmedabad and TRTC Guwahati), out of which only 3 Tool-Rooms have met the target. Cumulative achievement of training target for 8 Tool-Rooms is still 108 per cent.

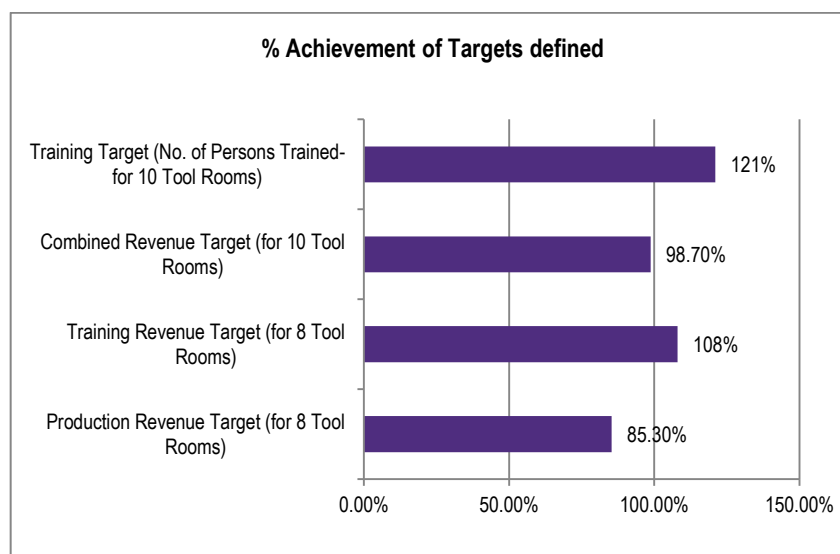


Achievement of Production Target

Separate production target has been defined for 8 Tool-Rooms (except for IGTR Ahmedabad and TRTC Guwahati), out of which only 3 Tool-Rooms have met the target. Cumulative achievement of production target for 8 Tool-Rooms is still 85.3 per cent.



Percentage Achievement of Targets defined

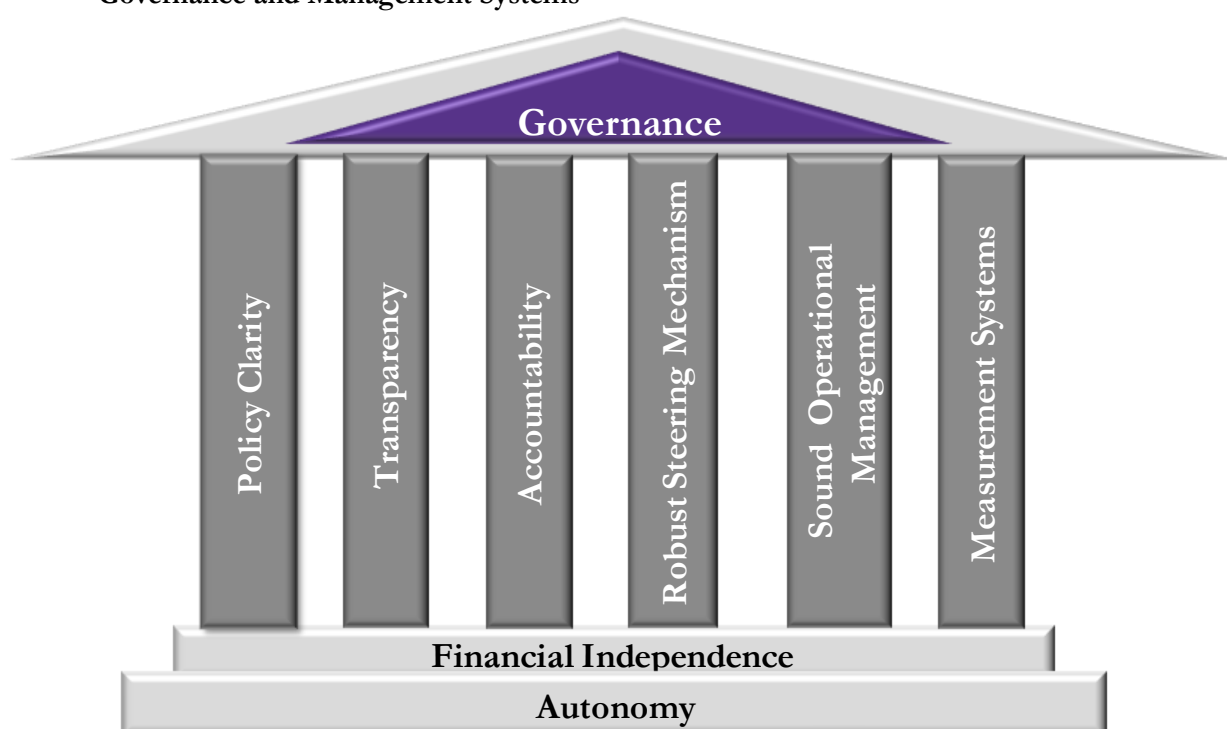


Achievement by Tool-Rooms with reference to targets fixed on various counts varies from 85 per cent to 121 per cent. In some Tool-Rooms targets are not fixed for lead times, rejection and persons trained but performance is reported in monthly reports. In Ahmedabad and Guwahati revenue targets are not fixed separately for production and training but only for total revenue.

2.2 Performance Drivers

Having analysed the combined performance of Tool-Rooms, it is only appropriate to consider the causes of their performance. The following paragraphs analyse the common factors that drive the performance:

- **Governance and Management Systems**



– Policy goals and shift in strategic directions

At the time of setting up of the Tool-Rooms the mandate was to assist MSMEs in improving their competency. The aim was to, primarily, assist in their technological upgradation and development through introduction of modern production technologies and application of precision tools and improvement of skills. The direction was to operate Tool-Rooms, as far as possible, on cost covering principles especially in production-related operations with an aim to be self-supporting in due course. Tool-Rooms were to produce precision tools essentially for MSMEs, but could do so for large scale industries to the extent such production was considered necessary to cover the costs. The mandate was therefore that the revenues from production shall support the training activity. Instead of charging fees, trainees of the main diploma course in tool and die making were paid scholarships as an incentive to join the training course. Government support was made available to the extent Tool-Rooms fell short of meeting their revenue expenses, more specifically known as recurring expenses. Tool-Rooms however did not become self-supporting. A number of reviews were carried. During one such review, under IGTRP, a Vision Paper was prepared in 1998 which emphasised financial self-sufficiency. On economic aspects it states the below:

“The Tool-Rooms will be output oriented. Thus, the input will be determined by the requirements of the output. This is the only way to improve the productivity of the Tool-Rooms.

The management of the Tool-Rooms will ensure that the available resources will be used in an optimal way. Compliance with this principle will automatically reduce unit costs. Physical and human resources of the Tool-Rooms are assets with a value related to time. If they are not used within a certain time their value will be lost forever, a fact which will add to cost.

The Tool-Room management will always keep in mind that the customers will only pay for the value added but never for the time when available capacities and capabilities are unused.

Sustainability of the Tool-Rooms will be ensured by full recovery of the cash expenses plus depreciation costs. Depreciation is nothing else but the cost incurred initially in purchasing assets and distributed over a period of time. This type of cost recovery is the minimum baseline, because it only aims at historical cost recovery and not at replacement cost recovery for investments in machinery and equipment.

For the Tool-Rooms to reach the level of self-financing, management will ensure to recover depreciation cost well in time of the actual life of the assets, to invest it, and to get a value which will be able to replace the asset.

The full cost recovery mandate from the above gospel became the guiding direction. Over the years the policy shifted. The present policy direction emphasizes on cost recovery without depreciation to start with, followed by cost recovery with depreciation. Payment of stipends to trainees of the main four years diploma course in tool and die making was stopped. While this course is still subsidized at all Tool-Rooms, presently fees are being charged from trainees to the tune of Rs.30000 per annum. The effect of the change in policy direction is that Tool-Rooms are going where the money is even at the cost of diluting emphasis on the development of MSMEs, impact and outreach. For the same reason, in some Tool-Rooms component production has overtaken tool production. Based on studies carried out at the instance of MoMSME the policy is being further reviewed on the following lines:

- Grant-in-aid (capital) from GOI will be utilised for investment in productive assets only.
- Cash surplus generated during the year will be utilised for procurement of capital items in subsequent year.

- The Tool-Rooms which have not been generating cash surplus should endeavour to achieve sustainability level in 2-3 years.
- The running of loss making units under PPP model may be considered as an alternative to closure.

i. Autonomy

Tool-Rooms are set up as autonomous bodies, Government of India societies, and have greater autonomy in comparison to Government offices or institutes like MSME Development Institutes. But still, to a large extent, these are guided by Government policies and in some cases even by Government rules and regulations. Management of the Tool-Rooms is vested with their governing bodies, called governing councils. Technically the councils are vested with all the decision making powers. Only limitations are in the form of the conditions the Government might put while sanctioning grants-in-aid which are not many.

Given that the Tool-Rooms are not financially independent and depend heavily on public money, the autonomy built in is less effective. It was found that the principle of autonomy is widely supported. However, it remains that Tool-Rooms are not independent when it comes to the important tasks like recruitment, procurement, incentivising staff, setting tuition fee, etc. Because they are publicly funded, their autonomy is inevitably circumscribed by numerous administrative rules issuing from public authorities.

For greater autonomy of a Tool-Room, the greater is the need for financial independence, transparency and accountability. An institution cannot demand greater autonomy without demonstrating financial independence and a high quality of governance. While the transparency standards are usually good across Tool-Rooms, the financial independence is the major hurdle in greater autonomy, except for one Tool-Room, rest all depend on Government funding.

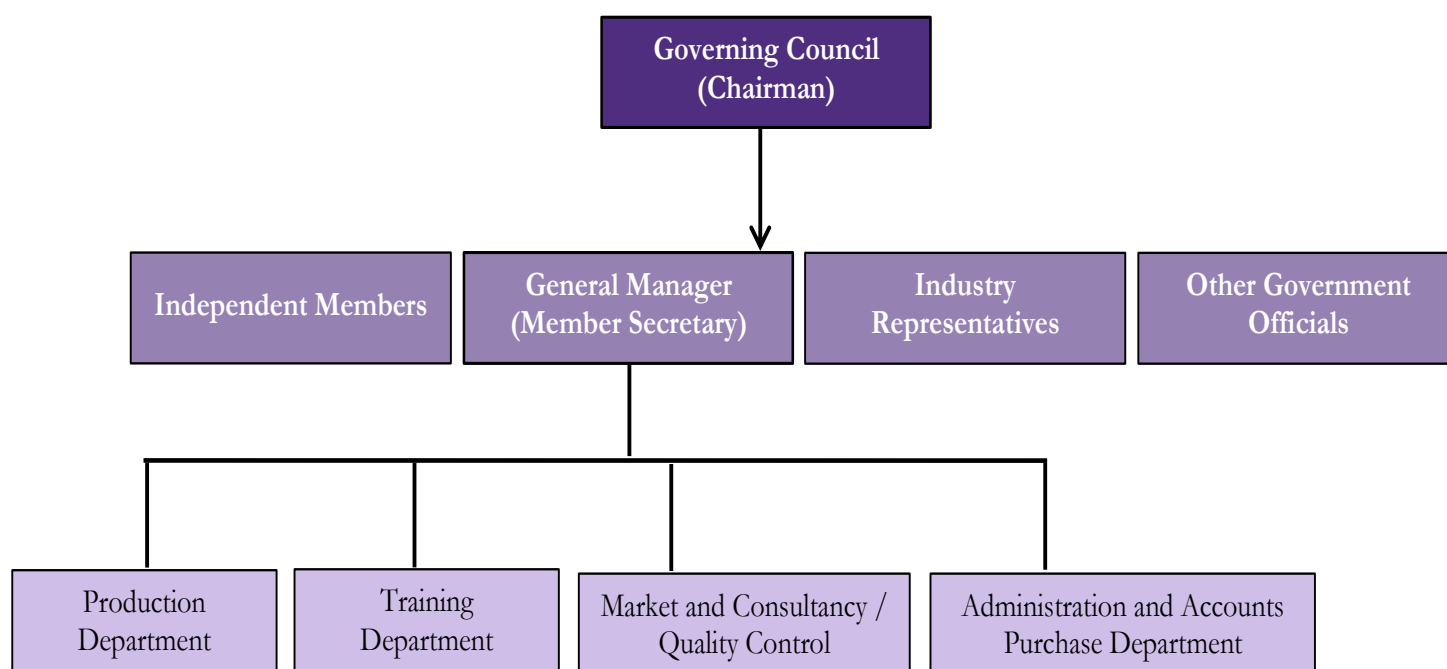
ii. Steering Mechanism

The 10 tool-rooms are centrally administered by Tool-Room Division of DC MSME, Ministry of Micro, Small and Medium Enterprises. The division is headed by a Director. It is this division which ensures commonality in approach of MoMSME so that the Tool-Rooms function to assist MSMEs in improving their competitiveness and that they comply with Government policies and directives for such autonomous bodies. The division also keeps checks so that the funds sanctioned by the Government to Tool-Rooms are spent for the purpose for which those were sanctioned. It also monitors the performance of each Tool-Room towards achievement of the targets yearly.

As each Tool-Room is an autonomous society, there is an independent Governing Council. A Governing Council typically has 15-16 members. The breakup is as below:

- Chairman – DC MSME
- 1/2 Independent Members
- 3-4 Industry Representatives
- GM (Member Secretary)
- About 10 other Govt. Officials (ex office)

A typical organisation structure of a Tool-Room is given below:



It has been noted that the Governing Councils are constituted in consultation with General Managers. These are currently made up of ex officio members and very few independent members. Meetings of the councils are less frequent than intended, in many cases convened once in a year. It generally coincides with the annual general meetings convened for approving the annual accounts and annual reports which takes precedence over other strategic matters. As a result, there is no clear distinction between Tool-Room management/ administration, and higher decision-making and supervisory responsibilities, which fall on the Governing Council. There is need to maintain a healthy distance between the Governing Council and the day-to-day management of the Tool-Rooms.

To be effective, Tool-Room governance requires a governing council made up of members with diverse experience, understanding of the local context, representative of all stakeholders and public service orientation. In its concept of governance, the governing council should include a strong majority of independent members who have no personal or professional ties to the institution.

Sound governance is sustainable with Governing Council Boards whose independent members are perceived as motivated, legitimate and credible. At more than one location, the interactions with the Tool-Room stakeholders indicated lack of trust among user industry mainly originating from the way members were nominated on the Board of the Governing Council. Their legitimacy, and the perception of their legitimacy, is directly related to the process that leads to their appointment or election. The credibility of individual board members is a result of their relevant experience, their expertise, their reputation for integrity and the confidence they inspire. The GC must define and publicise the profile of experience and expertise that it wants to assemble on the board. All independent members should be selected based on the experience and expertise required as per the profile established by the GC. As the GC members do not receive any monetary compensation for GC membership, their only motivation is public service. Such persons with high motivation for public good may be few and therefore monetary compensation to attract independent members on the Governing Council may be considered.

- For an effective governing, council is required to be made up of members with:
- diverse experience
 - understanding of local context
 - representative of all stakeholders
 - public serviced orientation

During the visits the following were generally observed with respect to the functions of the Governing Councils:

- Members do not attend meetings. Instead they depute, as substitute, some junior official in their organisations who may or may not be conversant with the working of the Tool-Room.
- Meetings are, generally, convened away from the Tool-Room premises and some members do not visit Tool-Room for years.
- Members' role in establishing the needs of training courses and design of the same to make them industry oriented is not significant.
- Representatives of industry are not taking interest in decision making and it is generally the officials from MoMSME and state government who deliberate in the meetings.

It is needed that the structure of the governing bodies is revised in favour of greater percentage of independent members with no personal or professional relation with the Tool-Room e.g. representatives from universities and technology leaders. They should be compensated for their services and given medium-term tenure with scope for renewal.

Greater autonomy may be extended to Tool-Rooms, particularly those which are now making full cost recovery and generating profits over few years like Bhubaneswar.

Next in the hierarchy is the CEO/ General Manager/ Principal Director or Project Manager by whatever name they are called. It is the General Manager who provides leadership to the management team and staff that leads to motivation of the team or lack of it. The General Manager is expected to have strong entrepreneurial skills that vary from person to person. Leadership and thus the level of motivation of the core management team were found varying in quality and effectiveness across the Tool-Rooms that in turn reflect in the Tool-Rooms' performance.

iii. Key performance indicators/ annual targets

Monitoring of performance is mainly on financial parameters and not as much on outreach and impact. Management efforts are directed accordingly. Production which was a major part of revenue earlier, is today down to one third. Even out of this small share of production-related services, a significant portion is from component production. A clear reason that emerged from interactions with the stakeholders is that because of the present policy direction emphasis is shifting towards component productions and training thus diluting outreach to MSMEs in the more important area of tooling. Likewise, in training much of the initiative is towards summer vacation training of students pursuing engineering studies, which is not towards bridging the industrial skill gap faced by MSMEs. Annual targets are likewise fixed and performance monitored by the office of DC MSME. Monthly performance is reported by Tool-Rooms on the following parameters.

Sl. No.	Head	Description
1	Revenue	Revenue from production
2		Revenue from Training
3		Revenue from bank interest
4		Revenue from other sources
5	Expenditure	Recurring Expenditure
6		Expenditure including depreciation
7	Cost recovery	Percentage cost recovery w/o depreciation
8		Percentage cost recovery including depreciation
9	Lead times	Delivery on time
10		Delivery delayed
11	Rejection	Lost
12		Value of salvaging

13	Machine utilisation	A, B and C classified machines, separately
14	Trainees trained	Trainees trained in long-term courses
15		Trainees trained in short-term courses
16	Units assisted	MSMEs technology related assistance
17		MSME Routine job work assistance
18		MSME through manpower placement
19		All the above for other large scale

As said “If you can’t measure it, you can’t manage it”. An organisation’s measurement and management system strongly affects the behaviour of its people. As evident, the focus of most of the Tool-Rooms is on cost recovery because they are mainly questioned on that single aspect. It is a classic example where the objectives and strategies reflect impact on MSMEs and development perspective but while measuring performance only financial measures are considered. There is a need for a more comprehensive performance measurement framework covering aspects in addition to financial, e.g. outreach, internal processes followed and innovation.

The focus on financial performance has definitely helped a great deal in increasing efficiency and bringing about financial discipline, however, this needs to be augmented with additional measures to bring effectiveness and alignment to the overall mission and strategy of the Tool-Room programme. The additional measures are required to capture both lead and lag aspects for outreach, capability enhancement and process efficiency.

iv. Management system

With the exception of two, all Tool-Rooms are certified organisations under ISO 9000 series and have well documented standard operating procedures. Perusal of past audits leads to the conclusion that procedures are followed. In a few cases only minor non-conformities were noticed which again were closed to the satisfaction of auditors. Tool-Rooms in Aurangabad and Bhubaneswar are also certified under ISO 1400 and OHSAS 18001 which are environment and safety standards. SOPs cover the following disciplines:

- Preventive Maintenance
- Estimation Sheet for quoting the prices for tooling
- Order processing
- Quality assurance
- In-process inspection report (including inspection of re work)
- Final inspection report
- Performance (trial) of the tool job completed
- Inspection report for the raw materials purchased
- Calibration Control Card for instruments
- Product Release Note and Deviation Note
- Rejection Report
- Customer satisfaction
- Design of Training Programmes
- Evaluation of training programmes

Systems for Operational Efficiency

Overall manufacturing efficiency is heavily correlated with percent of spindle cutting time on the machine tools. Unfortunately, most Tool-Rooms do not measure their machine utilization in terms of spindle cutting time. Some measure machine tool utilization by including setup, run time, etc. Estimated machine times ranged from 60% to 85%. However, private Tool-Rooms increasingly measure their machine utilization emphasizing spindle cutting time. High performing Tool-Rooms strive for spindle cutting time in excess of 90% of machine time (less preventive maintenance). Average Japanese Tool-Rooms have an average annual uptime of 87.9% on their 3-D milling machines and 79% on their 2-D milling machines. Factors contributing to a high spindle cutting time include standardized locators for quick load and unload of the work piece/jig, debugged CNC machine programs prior to changeover, preset tooling. In sophisticated private Tool-Rooms average die changeover time ranges from 18 minutes to 1 hour.

v. Understanding of Costs

While estimates are prepared for quoting and hours are allotted at various machining centres at the time of process planning, actual times taken at various cost centres generally exceed the estimated hours and, therefore, the cost estimates. A system to compare and analyse the cost estimates prepared at the time of quoting and actual cost on completion and analysis of reasons for deviations for future guidance is on low basis in all Tool-Rooms. In some Tool-Rooms it does not exist. Design of IT enabled Financial and Management Information System (FMIS) is a requirement. Continual improvement and accountability can be enhanced through the use of FMIS which can be linked to a suitable reward/ incentive system. Suitable training and capacity building of the staff is necessary alongside.

Need for ABC

Many Tool-Rooms do not recognize their cost structure, leading to sub-optimal business decisions and maybe in many cases non-competitive quotes. A typical approach taken by the Tool-Rooms is to develop an hourly rate and use the rate to quote a job or go by market rate. They estimate the schedule and the route and accordingly apportion costs. However, in many Tool-Rooms there is no comparison or closer scrutiny of estimated and actual costs.

The activity-based costing (ABC) approach is recommended. ABC is an accounting method for allocating overhead charges based on an equipment / space /overhead resource leasing per unit time concept. With ABC, the Tool-Rooms can better evaluate the economic viability of certain assets and make better decisions regarding:

- developing quotes,
- upgrading capital equipment and technology,
- expanding capabilities (e.g., into engineering, tooling repair, prototype development, tryout, etc.), and
- focusing on cost reduction opportunities.

vi. Procurement system

For procurement of raw materials for tool-making, the Tool-Room needs to follow the procurement guidelines laid down in the General Financial Rules (GFR) calling for quotations and decision making guided by L 1 principle due to which suppliers tend to quote lower rates, sometimes compromising on quality. The procurement procedures take 2 to 4 weeks which could lead to delay in deliveries unless running parallel with tool design which is not always the case. Being a public institute Tool-Rooms have to follow financial regulations. By fast action and careful drawing of specifications Tool-Rooms can overcome these hurdles. Procedures will have to be simplified when tooling activity increases.

For capital goods, action plans with details of equipment and related costs are prepared in consultation with local GC members and submitted to DC-MSME at the beginning of FY for approval in consultation with Integrated Finance Wing of the MoMSME. It is then ratified by the Governing Council. However, there are instances, when request for funds is submitted, the Integrated Finance Wing sometime raises objections at that stage although it was concurred in by them before. Procedure needs to be simplified and if Integrated Finance has agreed before they should not object at the advanced stage. Since the capital goods are also procured on least cost basis, two bid systems should be used.

Development of procurement manuals covering the operational details on the above suggestions would be beneficial to improve efficiency and effectiveness of procurement.

a. Services

Tool-Rooms' major services fall into two major categories, production and training. They also offer consultancy but most of this service is in terms of advice or manpower placement and is not charged. However, sometime they have provided management services like setting new Government projects and carrying out surveys for which fees are charged. Kolkata has assisted in such projects in the northeast and a surgical cluster in Baruipur, near it. Ludhiana has carried out survey for setting up a mini Tool-Room in Baddi in Himachal Pradesh and Bhubaneswar Tool Room has gone internationally in this respect. Services in production and training are summarised below:

Training services

- Long-term diploma course, four years duration, in tool and die making
- Post graduate, post diploma and certificates courses, varying in duration from one to two years in tool design, tool manufacture, CNC technology and other related subjects
- Post graduate courses in tool design, tool manufacture, and computer controlled manufacturing leading to M. Tech/ M.E. with university affiliation
- Short-term courses to cover various topics from the above mentioned subjects, quality control, testing and maintenance
- Practical training for students from engineering colleges and polytechnics, part time or full time during vacations
- Standardised or tailor-made courses for company employees, e.g. skilled workers, tool and die makers, machine operators, designers, supervisors
- Tailor-made courses sponsored by central and state Governments under their skill development programmes

The training services are considered to be among the best and there is steady rise in training output too. However, given the growth anticipated in the engineering sub sector, there is going to be significant gap between the industry demand and supply of skilled manpower. The Tool-Rooms have an opportunity to increase their output in training, especially the long term courses which will impact the skill shortage too. To achieve this there would be increasing need to augment the training infrastructure which may not be possible in the short to medium term. However, the same can be addressed through leveraging infrastructure available with the private sector. The model is very successful in Germany.

Production services

- Design and manufacture of tools and dies, moulds, jigs, fixtures, gauges, tool parts and components
- Application and demonstration of CAD
- Manufacture of small series and demonstration of pilot production
- Testing of tools and dies
- Repair and maintenance of tools, dies and other production aids

Germany – Multi Stakeholder Approach to Vocational Training System

Germany has emerged as the European industrial leader. Its automobile, mechanical engineering and chemical industries are the world leaders. Many factors have been credited for the success of German industry, but the underlying force in Germany's success is in the quality and reliability of its output produced. The essence of the quality that German products exhibit the skill level of its industrial workers. Their high skill levels are a direct result of the country's vocational training programs, more commonly referred to as the dual educational system. In Germany about 75 % of those between the ages of 15 and 25 undergo vocational training. This highly successful vocational training system relies on the support of many organizations - Employer associations, on both sectoral and local levels, play a major role in developing new courses, in modifying existing ones, and in advising the larger companies offering apprenticeships.

- Modification of tools, dies and other production aids
- Inspection of tool and tool parts
- Metrology services
- Heat treatment of all types of steel
- Standardization of tool-housing and components
- Consultancy on production technology (processes, materials, machines, products)
- Guidance of customers in tool design
- Some Tool-Rooms offer rapid prototyping
- Plasma nitriding
- Vacuum heat treatment

Performance of these two functions is measured in terms of revenue from production and training and also the number of persons trained.

Service quality

All Tool-Rooms have earned the reputation of good quality tool makers. Except Guwahati which does not have a production unit, they have contributed developing high-tech tools, some for the first time in the country. Indore has developed from filled and blow filled seal moulds for pharmaceutical industry. Kolkata moulds for polypropylene body and lid moulds for automobile batteries, the first major indigenisation of Maruti car, the start of the auto industry boom in the country. Industry finds prices high and delivery periods longer. General impression gathered during the study was that prices of tools from Government Tool-Rooms are, on an average, 25 to 30 per cent higher than private Tool-Rooms, even when compared to imports from China, Korea etc. Delivery times from Government Tool-Rooms are also high. For an average tool, Government Tool-Rooms take 10 weeks onwards whereas private Tool-Rooms and the industry expectation is about eight weeks.

International Consultancy

CTTC Bhubaneswar are consultants to Ministry of External affairs, Government of India, who are executing projects on vocational training, tool making and CNC technology in other developing countries. They are consultants to projects in Myanmar, Sri Lanka and Zimbabwe.

b. Marketing

Strategy

All Tool-Rooms have separate departments for marketing which also take care of consultancy services. There is however no uniformity in the level at which this department is headed, it varies from Assistant Manager to Senior Manager. The department is staffed with technical officers and assisted by secretarial services. Training programmes are marketed by managers of that department. Training calendars are kept at marketing departments for distribution to those who come for tooling requirements for use by their organisations.

Marketing strategy is to have one-on-one meetings with representatives of users at Tool-Rooms and also through visits to regular and prospective customers. Tooling requirements are discussed in detail and after all technical clarifications prices are quoted and commercial clarifications given, if needed. An advance of 40 per cent to 50 per cent is taken along with the order as security since tools are customer specific. Tool-Rooms also participate in exhibitions at national level, such as IMTEX and local exhibitions. Advertisements are inserted in newspapers and in TAGMA newsletter. Online marketing through Internet has made a start and will catch up. At present it has a limited success. All Tool-Rooms have their websites. For training networking with engineering colleges is additionally done. IGTR is reputed for quality products and covers a wide range. Many customers, therefore, visit IGTR on their own with requirement of the tooling and other services needed by them.

Client profile

With the exception of Bhubaneswar, Tool-Rooms have user industries in their regions to whom they market majority of their production-related services. Since industrial growth in Odisha has not come up to the level to use tooling facility at that Tool-Room, they had to go too far off places in Kerala and Karnataka to market their production facility which has been done considerably well, most of it for components and not for tooling. Table below reflects the customer profile of Tool-Rooms.

Client Profile of Tool-Rooms - Specialisation

Tool-Room	Automobiles	Plastic, Rubber, Glass	Forging, Foundry	Railways	Defence	Research and Development	General Engineering
IGTR Ahmedabad							√
IGTR Aurangabad	√						
IGTR Indore						√	
CTR Ludhiana	√						
CTTC Bhubaneswar					√		
IDTR Jamshedpur	√						
CTTC Kolkata				√			
CITD Hyderabad					√		
CIHT Jalandhar			√				
TRTC Guwahati		√*					

*Machining of parts of moulds etc.

Constraints:

Marketing in Tool-Rooms is not based on any organised and systematic need assessment of the market available to respective Tool-Rooms and its segmentation to assist MSMEs. Such study/survey has not been done in recent times. The last known such study was in 80s. Such a study needs to be done to give Government Tool-Rooms the leverage to encash the expertise developed in them and the reputation gained. Present is based on previous year's performance and estimates or guess work of how much can be added in the next financial years. Without such a study, it is difficult to analyse and explain shortfalls or excessive over achievements.

c. Infrastructure**Technical**

Next to captive Tool-Rooms of top industrial houses of the country, like Tata Motors or MarutiUdyog, Government Tool-Rooms have the best infrastructure for production-related services. For training too they have the best infrastructure which is supported by the infrastructure for production-related services. Buildings are well planned and spacious and include hostels for trainees. The equipment in Government tool-rooms is more or less alike, deviating from one another only as consequence of particular demand pattern of local industries or where a particular technology was tried out on experimental basis, like a rapid prototyping centre at Ludhiana.

Technical Equipment in production-related Services Sections

Government Tool-Rooms are well equipped. Equipment was supplied under Technical Co-operation Programmes. Subsequently, the plant and machinery are being augmented and upgraded from time to time. Weight carrying capacity goes upto 7000 kg. Typical equipment at these Tool-Rooms includes the following:

- CNC milling machines and machining centres, generally up to 3 axes. Some tool-rooms have 4 and 5- axes capabilities in this area
- CNC Wire cut EDM machines
- CNC sinking type EDM machines
- CNC lathes
- State of the art metrology equipment, includes CMMs
- Rapid prototyping equipment
- Mould spotting presses
- Heat treatment, some have vacuum heat treatment facility
- Plasma nitriding furnaces
- Surface, cylindrical and tool & cutter grinders
- Hardware and software for CAM

Equipment in the Training Department

Like production, training department at Tool-Room is well equipped, commensurate with current training needs of the Industry. Equipment includes conventional machines as well as CNC machines of a general engineering workshop. The departments also have typical Tool-Room equipment like:

- CNC Wire EDM Machines
- CNC EDM Machine
- CNC Milling Machine
- CNC Lathe
- CNC Co-ordinate Measuring Machine
- CAD/CAM work stations
- CAM SOFTWARE: UNGRAPHICS, MASTERCAM, DELCCAM, MTS, EMCO
- CAD SOFTWARE: SOLID WORKS, PROE, CATIA, UNIGRAPHICS, MASTERCAM, AUTOCAD, DELCAM
- CAE SOFTWARE: ANSYS, HYPERWORKS, NASTRAN, MOLDFLO

d. Design

The Design department plays an important role in the success of a Tool-Room. Its services include product design and tool design before the tools are taken up for production. Given the nature of MSMEs, this is a major area of strength of Government tool-rooms. The MSMEs typically come with the component expecting the Tool-Room to prepare the tool design to produce that component. Without design skills it is difficult to service such MSMEs. Design offices have high-end hardware. Software includes SOLID WORKS, PROE, CATIA, UNIGRAPHICS, MASTERCAM, AUTOCAD, DELCAM, ANSYS, HYPERWORKS, NASTRAN and MOLDFLO. After completion of design, simulation software helps in simulating the working parameters on computers and carrying out modifications if working problems are indicated. It has the following advantages:

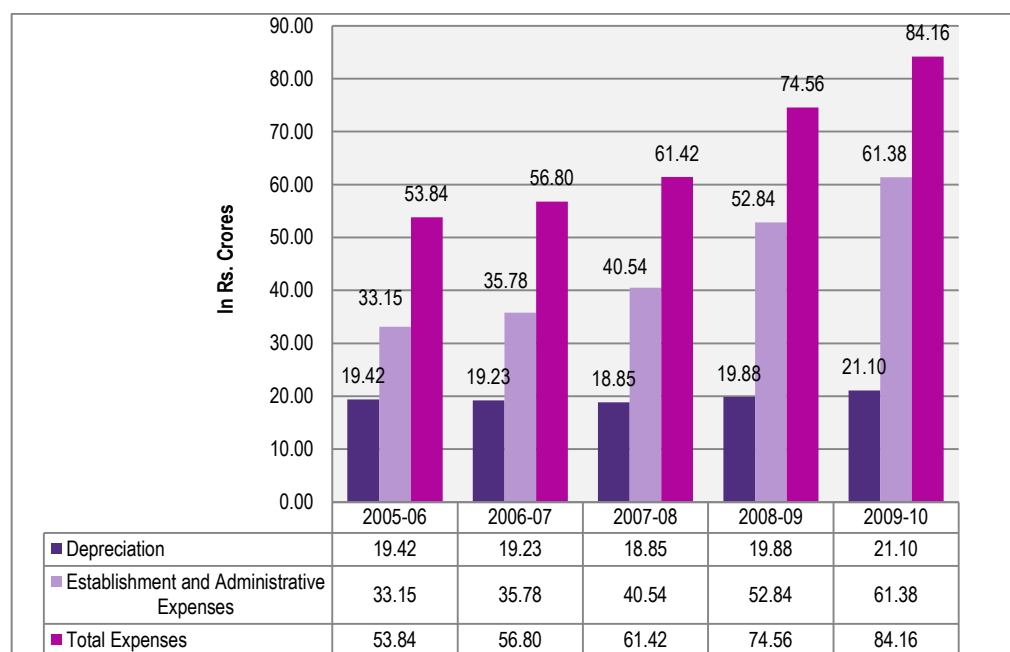
- Percentage of tools successful in first trials tends to improve significantly
- Time and labour spent on rework or remake of rejected or defective parts is reduced
- Delivery times are reduced

e. Human Resources

Manpower strength in Tool-Rooms varies, according to requirement, from nine in Guwahati to 118 in Ludhiana. Government pattern of scales of pay are followed including increases of dearness allowance twice a year. The wage level is better than market at lower levels of peons, clerks, unskilled and semiskilled workers but is inadequate at higher technical and managerial levels where market rates are better than Tool-Rooms. Still turnover rates are not high, basically due to job security reasons or another syndrome that persons who have less value in market do

not leave. High wage is a major expense, at some places it is a problem which management is trying to address by not filling higher posts at the expense of risk of de-motivation. Wage bill share is, 73 per cent, as reflected below:

Depreciation and Establishment & Administrative expenses as percentage of total expenses



Incentive Scheme: Tool-Rooms have been allowed to adopt incentive schemes based on the overall guidelines and limits decided centrally by DC-MSME. This is a group incentive scheme and does not take into account individual performance. The scheme lays stress on increasing generation of surplus of income over expenditure, 25 per cent of which is allowed to be distributed to the employees. There are restrictions on maximum amount payable, three month's salary if a Tool-Room has recovered cost without depreciation and four month's salary if it has recovered cost including depreciation. Distribution is further based on the following factors:

- Salary=Basic pay + grade pay +dearness allowance subject to maximum ceiling on basic pay of Rs.8560; those with basic pay of more than Rs.8560 are paid incentive based on Rs.8560 basic pay (revised after implementation of 6th Pay Commission Recommendations)
- Number of days of attendance in the financial year over the Tool-Room working days
- There is a maximum ceiling on payment of four months of Basic pay + grade pay + dearness allowance subject to maximum ceiling on basic pay of Rs.8560
- Contractual employees are also paid incentive based on the number of days they have worked and their wages
- Ad-hoc and contractual employees are also covered, but at a different (Lower) scale

Tool-Rooms do not have the independence to adopt their own incentives for better performance. The scheme is good for those Tool-Rooms which are already doing better but has not been able to motivate employees of Tool-Room which are not recovering costs. In some Tool-Rooms employees have declined to accept it. Employees do not know as to how much incentive they would get even after the close of the year until the accounts are audited. A scheme designed on principles of industrial engineering would be more motivating.

Career Progression: Tool-Rooms vary significantly in human resource development policies in terms of career progression of employees, to the extent of having de-motivating effects, when some important functionaries are stagnating at the same position for 15 to 20 years even when higher

vacancies are available. This is mostly to keep expenses low. But marginal additional costs at higher posts instead of lower posts would most likely be off-set by additional revenues because of better motivation and thus performance.

Skill and capacity building: Skill and knowledge development programmes are needed for existing employees. Apart from acquiring new skills and knowledge such programmes enhance employees' motivation. Like career progression, approach to this tool of motivation and better output because of improved skill and knowledge also varies from Tool-Room to Tool-Room. Monitoring of yearly programmes for this should be included in performance tasks of the CEOs.

Stakeholders' feedback

Stakeholders in Tool-Rooms are tool users, commercial Tool-Rooms, associations of industry, young men needing to acquire skills and lately, due to diversification of training courses, engineering colleges and polytechnics. Backward linkages are material and equipment suppliers. During the study the following issues emerged:

- Tool-Rooms have contributed significantly in the development of industries, particularly MSMEs and skill development
- Contribution to the development of MSMEs is good in the initial years of setting up
- Presently focus of MSMEs is diluted due to recent mandates of cost recovery, without depreciation to start with and then including depreciation
- Tool-Rooms should promote small commercial Tool-Rooms in their regions
- Tool-Rooms should constantly carry out technology upgradation, to keep pace with industry needs in all areas of production, design and training
- CNC machining capabilities should be steadily upgraded to 4- and 5-axes machining
- Some Tool-Rooms (2 are suggested) should be selected, Jamshedpur should be one of the two to enhance the physical size of tooling to meet the growing demand of auto component industry
- Vacuum heat treatment and plasma nitriding should be available, except Guwahati, Kolkata
- Following technologies should be introduced in Tool-Rooms:
 - Fine blanking
 - 5-axes tool and cutter grinding, include tungsten carbide tools
 - Water jet machining
 - Laser cutting
- Industry should be more involved in establishing the needs of training courses and the design of the same
- Weekend training courses for skill upgradation should be promoted; these could be conducted at Tool-Rooms or premises of industrial units or both. This suggestion came in the wake of the fact that micro and small units cannot afford to depute their employees for longer courses far away from their units.

2.3 Performance Snapshot of the 10 Tool-Rooms

In the above paragraphs common outputs and output drivers of the Tool-Room programme have been discussed. Tool-rooms have, during the course of working, developed specific leverages with regards to their services and sometimes have specific local context. These coupled with skills of management and staff have led to different scales of outputs and future opportunities. Such specific features of Tool-Rooms are briefly discussed below, details are discussed in the individual reports:

Indo-German Tool-Room, Ahmedabad

Perspective	Performance Indicator	Description
FINANCIAL	Revenue in 2010-11 (Rs. in lakhs)	689.22
	Revenue mix	• Production -22.21 per cent • Training- 74.08 per cent • Interest- 3.34 per cent • Other income- 0.38 per cent
	Cash expenditure, 2010-11(Rs. in lakhs)	675.34
	Recovery percentage without depreciation	102.05 per cent
	Recovery percentage with depreciation	78 per cent
	Profitability with depreciation (Profit/Revenues)	Not profitable
	Profitability without depreciation (Profit/Revenues)	2.01 per cent
	Percentage of depreciation in total expenses	22.62 per cent
	Percentage of operational revenues from training income	76.93 per cent
	Percentage of training income from long term courses	12.27 per cent
	Percentage of operational revenues from production (cash basis)	23.07 per cent
	Percentage of establishment and administrative and wages and salaries in total expenses (for 2009-10)	71.62 per cent
	Achievement of Financial Targets	Training (number of persons trained) target achievement is 107.4 per cent. Revenue target achievement was 86.15 per cent.
OUTREACH	Percentage of students in long term courses	22.69 per cent
	Percentage students in short term courses	77.31 per cent
	Percentage of MSMEs assisted (Revenue)	69.7 per cent
	No. of MSMEs assisted	1409
	Achievement of Outreach Target	93.81 per cent of total clientele is MSMEs and persons trained are 3543 which is 107.4 per cent of target set for the Tool-Room
	Specialisation in components	Components for general engineering in sector

	Specialisation in tooling	Injection moulds
INTERNAL PROCESS	Manpower Strength	85
	HR Incentive Policy-overall	HR Incentive policy is availed by IGTR Ahmedabad
	Percentage utilisation of asset – critical machines	52 per cent
	Percentage Rejection	7.60 per cent
	No of Critical Vacancies	4 (Senior Managers)
	Percentage Rework	7.62 per cent
	Effective Use of MIS	Tool-Room is ISO certified and hence effective use of MIS
	Percentage of long-term trainees placed	70-80 per cent
CAPABILITY ENHANCEMENT	New Technologies Acquired/ New Specialisation developed	Plasma Nitriding and Rapid Prototyping
	Relevance to regional/ local industry	70 per cent production services are supplied within the state
	Cost recovery status	Full costs, excluding depreciation, are being recovered for past 5 years
	Autonomy	Tool-Room has been achieving financial independence (without depreciation) for the last five years. Once it recovers cost including depreciation, it demonstrates readiness for greater autonomy.

Leverage points

- IGTR Ahmedabad has state-of-the-art equipment of a commercial Tool-Room and a vocational training institution in the region.
- Core management team is motivated which is reflected in the present performance level of cost recovery, from a difficult past and not so good performance level.
- It has developed expertise in environment-friendly plasma nitriding process of surface treatment.
- Expertise to design and manufacture moulds for irrigation and packaging industry (foldable crates).
- Expertise in the design and execution of training courses. Today it is running 11 long-term courses and a large number of short-term courses.

Pressure points

- Mandate of cost recovery has led to less concentration of management on production-related services in preference to training programmes.
- Does not keep track of utilisation of capacity in the form of machine hours available on high value and critical machines. Capacity utilisation recorded does not differentiate whether operators have taken time as per estimates while quoting or at the time of production planning, or have exceeded the same.

Areas to focus

- Abundant market for tools in which IGTR specialises, i.e., for irrigation industry. There is also a good market to be exploited in packaging, foldable crating systems.
- A chain of private commercial Tool-Rooms need hand-holding from IGTR to upgrade their operations. Here market for IGTR is in design of tools and precision machining facilities it can offer.

- Huge national requirement for skilled manpower and Government sponsored training programmes.

Indo-German Tool-Room, Aurangabad

Perspective	Performance Indicator	Description
FINANCIAL	Revenue in 2010-11 (Rs. in lakhs)	1513.08
	Revenue mix	• Production -55.39 per cent • Training- 40.36 per cent • Interest- 4.02 per cent • Other income- 0.23 per cent
	Cash expenditure, 2010-11(Rs. in lakhs)	1160.82
	Recovery percentage without depreciation	130.35 per cent
	Recovery percentage with depreciation	101.02 per cent
	Profitability with depreciation (Profit/Revenues)	1.01 per cent
	Profitability without depreciation (Profit/Revenues)	23.28 per cent
	Percentage of depreciation in total expenses	22.50 per cent
	Percentage of operational revenues from training income	42.15 per cent
	Percentage of training income from long term courses	56.73 per cent
	Percentage of operational revenues from production (cash basis)	57.85 per cent
	Percentage of establishment and administrative and wages and salaries in total expenses (for 2009-10)	67.83 per cent
	Achievement of Financial Targets	• Long-term training (number of persons trained) target achievement is 101.15 per cent • Short term training (number of persons trained) target achievement is 106.77 per cent • Production target achievement was 97.73 per cent • Training target achievement was 97.73 per cent
OUTREACH	Percentage of students in long term courses	27.83 per cent
	Percentage students in short term courses	72.17 per cent
	Percentage of MSMEs assisted (Revenue)	8.74 per cent

	No. of MSMEs assisted	405
	Achievement of Outreach Target	50.44 per cent of total clientele is MSMEs and persons trained are 4434 which is 110.85 per cent of target set for the Tool-Room
	Specialisation in components	Components for Automobile industry
	Specialisation in tooling	Design and manufacturing of moulds and press tools
INTERNAL PROCESS	Manpower Strength	91
	HR Incentive Policy-overall	HR: Incentive policy is availed by IGTR Aurangabad
	Percentage utilisation of asset – 15 critical machines	70% and 47% on 2 and 3 shift basis respectively
	Percentage Rejection	0.78 per cent
	No of Critical Vacancies	Sanctioned strength is 161. Only 91 personnel are in position. Remaining posts are kept vacant as the present strength is commensurate with the level of present activity. Additional workforce is taken on contract or casual basis as and when needed
	Percentage Rework	1.47 per cent
	Effective Use of MIS	Tool-Room is ISO certified and hence effective use of MIS
	Percentage of long term trainees placed	89.2 per cent
	No. of trainings conducted for staff/ trainers	14
CAPABILITY ENHANCEMENT	New Technologies Acquired/ New Specialisation developed	Reverse Engineering Simulation softwares
	Relevance to regional/ local industry	85.57 per cent production services are supplied within the state
	Cost recovery status	Full costs, excluding depreciation, are being recovered for past 5 years. In 2010-11, Tool-Room also recovered cost including depreciation
	Autonomy	Tool-Room has been achieving financial independence (without depreciation) for four years and also with depreciation in 2010-11. Once it recovers cost including depreciation, it demonstrates readiness for greater autonomy.

Leverage points

- IGTR Aurangabad has a highly motivated core management team lead by a General Manager.
- It has expertise in design and manufacture of moulds for plastics and metal (die casting dies) and press tools for plastic, auto component and electrical industries. It is one of the two Tool-Rooms which can upgrade their expertise to design and make fine blanking tools.
- It has also developed a high-level expertise in the design and execution of vocational training programmes, both long-term for young men in their career development and also short-term training courses for persons already working in industry to sharpen their skills. These training

programmes are highly accepted. Today it is organising a number of training programmes for central and state Governments and also for foreign Governments.

- Management has well laid policies directed toward objectives of the Tool-Room. It aims for a good mix of revenue; 50:50 between training and production related services. Again in production not less than 50 per cent revenue from tool production. Also it aims that at least half the fees realised in training programmes should come from the trainees. This is a good policy. If, due to change in policy, Government discontinues or reduces sponsoring training programmes at IGTR, the gap can be filled up from market. Majority of its production related services are for MSMEs.
- Good HRD policies. Career progression and skill and knowledge development programmes for employees are on sound footing.

Pressure points

- It does not have the independence to have its own incentive scheme to improve performance and has to follow the incentive scheme centrally approved for all Tool-Rooms which is complex beyond the comprehension of workmen and puts limitations on the amount of incentive payable even out of the earned amount.
- Lacks autonomy of a private commercial Tool-Room. Now when it has reached the performance level of full cost recovery, it qualifies for greater autonomy.

Areas of focus

- Abundant tool market from auto component sector of which the Tool-Room has the know-how.
- There is abundant market for progressive press tools and fine blanking tools in the auto component sector. In the years to come auto component industry will switch, more and more, to fine blanking instead of conventional press tools. IGTR has the ability to handle such tools.
- Concentration of private commercial Tool-Rooms which need to use Tool-Room facility to upgrade their operations. Some of Tool-Room's alumni has started small tool and engineering shops. They are using Tool-Room facilities to supplement their resources. Management encourages such ventures, a positive step in the right direction.
- Huge national demand of skilled workers

Indo-German Tool-Room, Indore

Perspective	Performance Indicator	Description
FINANCIAL	Revenue in 2010-11 (Rs. in lakhs)	683.61
	Revenue mix	• Production -32.56 per cent • Training- 65.70 per cent • Interest income- 1.28 per cent • Other income- 0.46 per cent
	Cash expenditure, 2010-11(Rs. in lakhs)	673.72
	Recovery percentage without depreciation	101 per cent
	Recovery percentage with depreciation	77 per cent
	Profitability with depreciation (Profit/Revenues)	Not Profitable
	Profitability without depreciation (Profit/Revenues)	1.42 per cent
	Percentage of depreciation in total expenses	24.49 per cent
	Percentage of operational revenues from training income	66.87 per cent
	Percentage of training income from long term courses	59.47 per cent
	Percentage of operational revenues from production (cash basis)	33.13 per cent
	Percentage of establishment and administrative and wages and salaries in total expenses (for 2009-10)	82.02 per cent
	Achievement of Financial Targets	• Production target achievement was 55.64 per cent • Training target achievement was 110.90 per cent
OUTREACH	Percentage of students in long term courses	32.96 per cent
	Percentage students in short term courses	67.04 per cent
	Percentage of MSMEs assisted (Revenue)	25 per cent
	No. of MSMEs assisted	461
	Achievement of Outreach Target	75.70 per cent of total clientele is MSMEs and persons trained are 4208.
	Specialisation in components	Precision components for R & D
	Specialisation in tooling	Form Filled Seal Moulds and Blow Filled Seal Moulds, Press Tools, Magnets and Radio Frequency Quardra Poles
INTERNAL	Manpower Strength	84

PROCESS	HR Incentive Policy-overall	HR Incentive policy is in place but is not availed by IGTR Indore
	Percentage utilisation of asset – critical machines	42 per cent
	Percentage Rejection	1.02 per cent
	No of Critical Vacancies	18 positions including 4 posts of Senior managers who should normally head Production, Marketing, Design and Training.
	Percentage Rework	1.20 per cent
	Effective Use of MIS	Tool-Room is ISO certified and hence effective use of MIS
	Percentage of long term trainees placed	89.2 per cent
CAPABILITY ENHANCEMENT	New Technologies Acquired/ New Specialisation developed	--
	Relevance to regional/ local industry	35 per cent production services are supplied within the state
	Cost recovery status	Full costs, excluding depreciation, are being recovered for past 5 years except for 2009-10.
	Autonomy	Tool-Room has been achieving financial independence (without depreciation) for the last five years except 2009-10. Once it recovers cost, including depreciation for few years, it should be considered for more autonomy.

Leverage points

- IGTR has the expertise to design and manufacture moulds for plastic industry, unique know-how developed is for form fill seal moulds and blow fill seal moulds for pharmaceutical applications. It also has the know-how to manufacture mould for mini components used in pace maker instrumentation.
- It has significant share of tooling in its production related services.
- It has the expertise to design and execute vocational training courses.

Pressure points

- Low level utilisation of high value and critical machines, 28 per cent as per industry norms of 24X7 working or 42 per cent based on the present two shift system of working. A good FMIS is needed to keep track of engagement of such machines.
- High breakdown time of high value and critical machines. For 17 per cent of available hours, such machines are under breakdown.
- No incentive scheme.

Areas of focus

- There are private commercial Tool-Rooms needing to upgrade their operations by hand-holding by IGTR in the shape of assistance to them in tool design and machining of tool parts.
- Local presence of user industry clusters of auto and auto component and pharmaceutical industries.
- Concentration of engineering colleges and polytechnics. Their students need training CNC technology and CAD/CAM.
- Huge national requirement for skilled manpower.
- Government sponsored vocational training programmes.

Central Tool-Room, Ludhiana

Perspective	Performance Indicator	Description
FINANCIAL	Revenue in 2010-11 (Rs. in lakhs)	664.94
	Revenue mix	• Production -54.80 per cent • Training- 42.33 per cent • Other income- 2.88 per cent
	Cash expenditure, 2010-11(Rs. in lakhs)	666.42
	Recovery percentage without depreciation	100 per cent
	Recovery percentage with depreciation	82 per cent
	Profitability with depreciation (Profit/Revenues)	Not Profitable
	Profitability without depreciation (Profit/Revenues)	Not Profitable
	Percentage of depreciation in total expenses	18.17 per cent
	Percentage of operational revenues from training income	43.58 per cent
	Percentage of training income from long term courses	29.15 per cent
	Percentage of operational revenues from production (cash basis)	56.42 per cent
	Percentage of establishment and administrative and wages and salaries in total expenses (for 2009-10)	85.84 per cent
	Achievement of Financial Targets	• Training (number of persons trained) target achievement is 122 per cent • Production target achievement was 104.70 per cent • Training target achievement was 96.39 per cent
OUTREACH	Percentage of students in long term courses	19.47 per cent
	Percentage students in short term courses	80.53 per cent
	Percentage of MSMEs assisted (Revenue)	51.78 per cent
	No. of MSMEs assisted	2508
	Achievement of Outreach Target	78.35 per cent of total clientele is MSMEs and persons trained are 1952 which is 122 per cent of training target (number of persons to be trained).

	Specialisation in components	Components for Auto Component Industry
	Specialisation in tooling	Press tools for auto component industry, Progressive Tools, Combination Tools, Injection moulds , fixture , gauges etc.
INTERNAL PROCESS	Manpower Strength	118
	HR Incentive Policy-overall	HR: Incentive policy is in place but is not availed by CTR Ludhiana
	Percentage utilisation of asset-critical machines	40 per cent
	Rejection (in value Rs. lakhs)	7.7
	Percentage vacancy or No of Critical Vacancies	Senior Manager / Dept. Head
	Percentage Rework	0.7 per cents
	Effective Use of MIS	Tool-Room is ISO certified and hence effective use of MIS
	Percentage of long term trainees placed	100 per cent
	No. of trainings conducted for staff/ trainers	10
CAPABILITY ENHANCEMENT	New Technologies Acquired/ New Specialisation developed	Rapid Prototyping
	Relevance to regional/ local industry	56 per cent production services are supplied within the state
	Cost recovery status	CTR Ludhiana is not recovering cost (both with and without depreciation) for past 3 years.
	Autonomy	Tool-Room has not been achieved financial independence (both with and without depreciation) Once it recovers cost including depreciation for few years, it should be allowed more autonomy.

Leverage points

- CTR has expertise in design and manufacture of high-end press tools, compound, combination and progressive tools, for auto components industry.
- It has the best rapid prototyping equipment in the region to assist the industry in development of new products.
- It has an efficient heat treatment plant. Technology of salt baths for heat treatment was introduced to bicycle, fasteners and hand tools industry of the region by CTR. It continues to be the leader in the field.
- It has the expertise to design and execute vocational training courses.

Pressure points

- Depleting skill base. No designers to use simulation softwares available as trained employees have left without substitutes. Likewise design expertise is not available for design of die casting dies due to which such tools are not being presently undertaken.
- It has the maximum number of employees amongst Tool-Rooms. The strength is 118. This increases the expense on salaries of the centre without proportionate increase in revenue. VRS might help.
- Motivation of the core management team is rather low due to various reasons. Important departments like marketing and production are being managed by junior officers as stop gap arrangement. There is no incentive scheme.

- Machine utilisation is low. Breakdown time is high, 13 per cent for high value and critical machines.

Areas to focus

- Presence of tool user industry clusters like auto component, pharmaceutical, plastic, hand tools, bicycle.
- A chain of private commercial Tool-Rooms need hand-holding from CTR to upgrade their operations. The assistance they need is in design of tools and precision machining facilities that CTR offers. Tooling market in the region is estimated to be Rs.1400 crores.
- Huge national requirement for skilled manpower.
- Government sponsored vocational training programmes.

Central Tool-Room and Training Centre, Bhubaneswar

Perspective	Performance Indicator	Description
FINANCIAL	Revenue in 2010-11 (Rs. in lakhs)	1506.97
	Revenue mix	• Production -30.1 per cent • Training- 64.92 per cent • Others- 5 per cent
	Cash expenditure, 2010-11(Rs. in lakhs)	997.83
	Recovery Percentage without depreciation	151.02 per cent
	Recovery Percentage with depreciation	113.47 per cent
	Profitability with depreciation (Profit/Revenues)	11.67 per cent
	Profitability without depreciation (Profit/Revenues)	33.78 per cent
	Percentage of depreciation in total expenses	25.03 per cent
	Percentage of operational revenues from training income	68.34 per cent
	Percentage of training income from long term courses	29.15 per cent
	Percentage of operational revenues from production (cash basis)	31.66 per cent
	Percentage of establishment and administrative and wages and salaries in total expenses (for 2009-10)	54 per cent
	Achievement of Financial Targets	• Training (number of persons trained) target achievement is 136.71 per cent • Production target achievement was 100.71 per cent • Training target achievement was 130.45 per cent
OUTREACH	Percentage of students in long term courses	25.28 per cent
	Percentage students in short term courses	74.72 per cent
	Percentage of MSMEs assisted (Revenue)	2.26 per cent
	No. of MSMEs assisted	375
	Achievement of Outreach Target	44.86 per cent of total clientele is MSMEs and persons trained are 9570 which is 136.71 per cent of training target (number of persons to be trained)
	Specialisation in components	Components for Aerospace Industry

	Specialisation in tooling	Fin farming Tools, Progressive Press Tools
INTERNAL PROCESS	Manpower Strength	68
	HR Incentive Policy-overall	HR Incentive policy is in place and is availed by CTTC Bhubaneswar
	Percentage utilisation of asset – critical machines	84% and 59% on 2 and 3 shift basis, respectively
	Percentage Rejection	0.80 per cent
	No of Critical Vacancies	There are 51 vacant posts, out of which 37 are since inception (1994)
	Percentage Rework	1.63 per cent
	Effective Use of MIS	Tool-Room is ISO certified and hence effective use of MIS
	Percentage of long term trainees placed	
	No. of trainings conducted for staff/ trainers	10
CAPABILITY ENHANCEMENT	New Technologies Acquired / New Specialisation developed	Vacuum Heat Treatment
	Relevance to regional/ local industry	15 per cent production services are supplied within the state
	Cost recovery status	CTTC Bhubaneswar is recovering cost (both with and without depreciation) for past 5 years.
	Autonomy	Tool-Room has achieved financial independence (both with and without depreciation) which demonstrates its readiness for autonomy.

Leverage points

- CTTC Bhubaneswar has a highly motivated team led by an able General Manager.
- It has developed expertise in manufacture of components for aerospace industry involving complex profiles and extremely high accuracies of the order of 2 microns. It is the only one amongst ten Government Tool-Rooms to have a '10000 class clean room' to handle such components. In such a clean room, there will not be more than 10000 dust particles in one cubic meter space in the room which is the requirement and necessity to manufacture and measure such components.
- It has developed the expertise to design and develop progressive press tools and has the competency, a dedicated team plus well maintained high-end equipment to go in for next generation tools needed for fine blanking needed by the fast growing auto component industry. However Tool-Room has to market such tools in other regions as local industry is not yet at that level for use of this process.
- It is leading the Tool-Room family in training programmes. It has nearly the whole mix of Tool-Room related training courses run in all other tool-rooms, with the exception of courses leading to degrees of Master of Engineering or Master of Technology, which needs affiliation to a university. It has reached such high levels of vocational training that for practical part of the curriculum, IITs are using their premises and expertise.
- Incentive scheme at the Tool-Room is the best permissible under the guidelines of DC-MSME. Career progression and skill and knowledge development programmes are systematically carried out. These factors lead to motivation and better performance.

Pressure points

- It does not have the independence to have its own incentive scheme to improve performance and has to follow the incentive scheme centrally approved for all Tool-Rooms which is complex beyond the comprehension of workmen and puts limitations on the amount of incentive payable even out of the earned amount.
- It has moved away from its objective of assisting the industry, primarily MSMEs, by providing quality tooling to improve their competitiveness and is presently carrying out production of components. Management's efforts to search for variety of work elsewhere instead of keeping expensive equipment idle are laudable. But it is time to reach out to MSMEs in tooling. Components are contributing to cost recovery. These are good for filling the gap but should not now be the main thrust area. Keeping the present level of concentration on components start should be made to fix yearly targets to outreach MSMEs in tooling. These could be progressively increased to contribute to the development of MSMEs at a reasonable level. CTTC team has the competence to do it. For this purpose, a market survey is necessary to identify MSME market relevant to CTTC.

Areas of focus

- They are one of the two Tool-Rooms which can upgrade their expertise to design and make fine blanking tools. There is abundant market for progressive press tools and fine blanking tools in the auto component sector.
- Auto component industry is more and more switching over to use of vacuum heat treatment. Tool-Rooms which do not have this technology can also make use of it at CTTC.

Indo-Danish Tool-Room, Jamshedpur

Perspective	Performance Indicator	Description
FINANCIAL	Revenue in 2010-11 (Rs. in lakhs)	1104.65
	Revenue mix	• Production -23.32 per cent • Training- 70.06 per cent • Others- 6.62 per cent
	Cash expenditure, 2010-11(Rs. in lakhs)	871.90
	Recovery percentage without depreciation	126.69 per cent
	Recovery percentage with depreciation	96.61 per cent
	Profitability with depreciation (Profit/Revenues)	Not Profitable
	Profitability without depreciation (Profit/Revenues)	21.07 per cent
	Percentage of depreciation in total expenses	23.75 per cent
	Percentage of operational revenues from training income	75.03 per cent
	Percentage of training income from long term courses	26.51 per cent
	Percentage of operational revenues from production (cash basis)	24.97 per cent
	Percentage of establishment and administrative and wages and salaries in total expenses (for 2009-10)	51.74 per cent
	Achievement of Financial Targets	• Long term training (number of persons trained) target achievement is 116.37 per cent • Short term training (number of persons trained) target achievement is 157.63 per cent • Production target achievement was 80.50 per cent • Training target achievement was 140.71 per cent
OUTREACH	Percentage of students in long term courses	14.34 per cent
	Percentage students in short term courses	85.66 per cent
	Percentage of MSMEs assisted (Revenue)	30 per cent
	No. of MSMEs assisted	1555
	Achievement of Outreach Target	69.70 per cent of total clientele is MSMEs and persons trained are 5550 which is 150 per cent of training target

		(number of persons to be trained)
	Specialisation in components	Components for Telecom Industry IDTR Jamshedpur is mainly catering to automobile and auto component industry.
	Specialisation in tooling	Sheet Metal Tools
INTERNAL PROCESS	Manpower Strength	72
	HR Incentive Policy-overall	HR Incentive policy is in place and is availed by IDTR Jamshedpur
	Percentage utilisation of asset – critical machines	62 per cent
	Percentage Rejection	0.95 per cent
	Percentage vacancy or No of Critical Vacancies	There are 46 vacant posts, out of which 20 are since inception (1992)
	Percentage Rework	0.09 per cent
	Effective Use of MIS	Tool-Room is ISO certified and hence effective use of MIS
	Percentage of long term trainees placed	100 per cent
CAPABILITY ENHANCEMENT	New Technologies Acquired/ New Specialization developed	Vacuum Heat Treatment
	Relevance to regional/ local industry	60 per cent production services are supplied within the state
	Cost recovery status	IDTR Jamshedpur is recovering cost (without depreciation) for past 5 years.
	Autonomy	Tool-Room has achieved financial independence (without depreciation). It should be given higher autonomy when it starts recovering costs with depreciation.

Leverage points

- A hard working and motivated team, led by a competent General Manager, at ITDR Jamshedpur has developed expertise in design and manufacture of press tools for automobile and auto component industry. This includes forging dies for forgings, about 80 per cent of which will again be used for the manufacture of components for auto component industry.
- Good HR policy is in vogue. Communication channels are maintained at all levels of employees. There is a systematic approach to depute employees for skill and management development programmes. An incentive scheme is in position to motivate employees towards better performance. About four month's salary is likely to be paid as incentive for performance during 2010-11 (subject to ceiling for employees with higher basic pay).
- It has linkage with central tool-shop of Tata Motors and exchange information with them about developments taking place in the field of tooling. It also assists in marketing with data bank maintained at that tool-shop.
- It has the know-how to design and execution of vocational training programmes, both long-term, post graduate, diploma and certificate courses and short-term training courses for persons already working in industry to sharpen their skills.

Pressure points

- Automobile and auto component industries need some large size tools but the Tool-Room is refusing tools having parts of size higher than 1.5 metre and 1000 kg in weight. They have drawn an action plan to augment their capacity in this regards.

- Tool-Room has limitation of space to expand its activities and is looking for a plot of land adjacent to its premises.
- It does not have the independence to have its own incentive scheme to improve performance and has to follow the incentive scheme centrally approved for all Tool-Rooms which is complex beyond the comprehension of workmen and puts limitations on the amount of incentive payable even out of the earned amount.
- Lacks autonomy of a private commercial Tool-Room. Now when it has reached the performance level of full cost recovery, it should be allowed more autonomy.

Areas to focus

- Abundant tool market from auto component sector of which the Tool-Room has the know-how to design and produce. 80 per cent of the output of engineering industry in Jamshedpur goes to auto components.
- Private commercial Tool-Rooms need to use Tool-Room facility to upgrade their operations.
- Huge national demand of skilled workers.

Central Tool-Room and Training Centre, Kolkata

Perspective	Performance Indicator	Description
FINANCIAL	Revenue in 2010-11 (Rs. in lakhs)	543.49
	Revenue mix	• Production -24.98 per cent • Training- 73.86 per cent • Others- 1.17 per cent
	Cash expenditure, 2010-11(Rs. in lakhs)	598.75
	Recovery percentage without depreciation	90.77 per cent
	Recovery percentage with depreciation	74.06 per cent
	Profitability with depreciation (Profit/Revenues)	Not Profitable
	Profitability without depreciation (Profit/Revenues)	Not Profitable
	Percentage of depreciation in total expenses	18.40 per cent
	Percentage of operational revenues from training income	74.73 per cent
	Percentage of training income from long term courses	69.43 per cent
	Percentage of operational revenues from production (cash basis)	25.27 per cent
	Percentage of establishment and administrative and wages and salaries in total expenses (for 2009-10)	87.58 per cent
	Achievement of Financial Targets	• Production target achievement was 73.38 per cent • Training target achievement was 89.20 per cent
OUTREACH	Percentage of students in long term courses	23.96 per cent
	Percentage students in short term courses	76.04 per cent
	Percentage of MSMEs assisted (Revenue)	2.13 per cent
	No. of MSMEs assisted	64
	Achievement of Outreach Target	19.22 per cent of total clientele is MSMEs and persons trained are 2817
	Specialisation in components	CTTC Kolkata is mainly serving to railways industry
	Specialisation in tooling	press tools and jigs & fixtures
INTERNAL	Manpower Strength	72

PROCESS	HR Incentive Policy-overall	HR Incentive policy is in place and is not availed by CTTC Kolkata
	Percentage utilisation of asset – critical machines (considering 2 shifts)	30 per cent
	Percentage Rejection	-
	No of Critical Vacancies	9
	Percentage Rework	4 per cent
	Effective Use of MIS	Tool-Room is ISO certified and hence effective use of MIS
	Percentage of long term trainees placed	95 per cent
CAPABILITY ENHANCEMENT	New Technologies Acquired/ New Specialisation developed	Rapid Prototyping
	Relevance to regional/ local industry	94.79 per cent production services are supplied within the state
	Cost recovery status	CTTC Kolkata has started recovering costs (without depreciation) for past 3 years.
	Autonomy	Tool-Room has achieved financial independence (without depreciation) only for past three years. It should be given higher autonomy when it recovers costs with depreciation.

Leverage points

- CTTC is the most well-equipped Tool-Room in West Bengal for tool making and training programmes, including unique technologies of vacuum heat treatment and rapid prototyping. It has adequate number of employees to make use of it.
- It is competent to design and execute training programmes in tool engineering, CNC technology, CAD and CAM.
- It has expertise in design and manufacture of dies and moulds for plastic and surgical instruments industries.

Pressure points

- It lacks know-how to maintain expensive equipment. Seven out of fifteen high value machines considered critical for Tool-Room operations are under breakdown for long periods, some for more than four years. Management cannot, by routine efforts, get these machines to working order. At the present stage it needs an organised study, a time bound programme and funds to put the machines back to operational level. Some may be beyond economic repairs and would need replacements.
- Expertise in design has diluted and trained employees have left without replacements. More people need to be inducted and trained in the use of hardware and software available at Tool-Room.
- Core management team and staff lack motivation. Weak policy on career progression is the reason. Officials in key areas are stagnating for fifteen years when higher posts are kept vacant. Other reasons are lack of systematic skill and knowledge development programmes for employees and leadership.

Areas to focus

- West Bengal has significant presence of tool users industries in the area of expertise at CTTC, like moulds and dies for plastic and surgical instruments industries. There are engineering industries which need to outsource complex machining operations in CNC machining. CTTC can get more market from these.

- There is strong presence of small tool makers which can upgrade their operations if CTTC can do the hand-holding and supplement their sources by offering help in design and precision machining operations.

Central Institute of Tool Design, Hyderabad

Perspective	Performance Indicator	Description
FINANCIAL	Revenue in 2010-11 (Rs. in lakhs)	776.29
	Revenue mix	• Production -4.69 per cent • Training- 82.39 per cent • Others- 12.91 per cent
	Cash expenditure, 2010-11(Rs. in lakhs)	631.52
	Recovery percentage without depreciation	122.92 per cent
	Recovery percentage with depreciation	Not available
	Profitability with depreciation (Profit/Revenues)	Not available
	Profitability without depreciation (Profit/Revenues)	18.64 per cent
	Percentage of depreciation in total expenses	32.67 per cent
	Percentage of operational revenues from training income	94.61 per cent
	Percentage of training income from long term courses	34.49 per cent
	Percentage of operational revenues from production (cash basis)	5.39 per cent
	Percentage of establishment and administrative and wages and salaries in total expenses (for 2009-10)	65.19 per cent
	Achievement of Financial Targets	• Long term training (number of persons trained) target achievement is 148.31 per cent • Short term training (number of persons trained) target achievement is 101.29 per cent • Production target achievement was 24.28 per cent • Training target achievement was 88.84 per cent
OUTREACH	Percentage of students in long term courses	16.55 per cent
	Percentage students in short term courses	83.45 per cent
	Percentage of MSMEs assisted (Revenue)	21.5 per cent

	No. of MSMEs assisted	641
	Achievement of Outreach Target	96.83 per cent of total clientele is MSMEs and persons trained are 5826 which is 106.89 per cent of the training target (number of persons to be trained)
	Specialisation in components	CITD Hyderabad is serving to defence industry
	Specialisation in tooling	Intricate Tools, Dies, Moulds, Jigs, Fixtures, Servo valve bodies, Hydraulic manipulator assembly, etc.
INTERNAL PROCESS	Manpower Strength	56
	HR Incentive Policy-overall	HR Incentive policy is in place but is not availed by CITD Hyderabad
	% utilization of asset (As reported by CITD to Governing Council, analysis like other Tool-Rooms not done, due to lack of data)	CNC Machines: 83%, others:71% to92%
	Percentage Rejection	-
	No of Critical Vacancies	-
	Percentage Rework	-
	Effective Use of MIS	Tool-Room is ISO certified and hence effective use of MIS
	Percentage of long term trainees placed	100 per cent
	No. of trainings conducted for staff / trainers	65
CAPABILITY ENHANCEMENT	New Technologies Acquired / New Specialization developed	Low Cost automation
	Relevance to regional / local industry	52 per cent production services are supplied within the state
	Cost recovery status	CITD Hyderabad has recovered costs (without depreciation) for past 5 years.
	Autonomy	Tool-Room has achieved financial independence (without depreciation) for past 5 years. It should be given higher autonomy when it recovers costs with depreciation.

Leverage points

- CITD has the expertise to design and execute vocational training courses.
- It is the only one amongst 10 Tool-Rooms offering M.Tech./ M.E. courses in affiliation with universities.
- It has the expertise to manufacture tools and components for research and development organisation like ISRO and Bhabha Atomic Research Centre, has contributed to the development of tooling for antenna for Chandrayana project.
- It has the equipment to handle 5-axes CNC machining.
- It is the only Tool-Room with a full-fledged low cost automation engaged in training courses and design of systems.
- Presence of tool user clusters of auto component and electrical industry.

Pressure points

- Lack of concentration on production. In 2010-11, production value was less than 5 per cent of total revenue.
- Lack of a good FMIS to keep track of machine capacity utilisation.
- No incentive scheme.

Areas to focus

- There are about 100 private commercial Tool-Rooms needing to upgrade their operations by hand-holding by CITD in the shape of assistance to them in tool design and machining of tool parts.
- Major concentration of engineering colleges and polytechnics. Their students need training in CNC technology and CAD/CAM.
- Huge national requirement for skilled manpower.
- Government sponsored vocational training programmes.

Tool-Room and Training Centre, Guwahati

Perspective	Performance Indicator	Description
FINANCIAL	Revenue in 2010-11 (Rs. in lakhs)	124.82
	Revenue mix	• Production -5.46 per cent • Training- 74.08 per cent • Others- 20.46 per cent
	Cash expenditure, 2010-11(Rs. in lakhs)	88.90
	Recovery percentage without depreciation	140.40 per cent
	Recovery percentage with depreciation	76.09 per cent
	Profitability with depreciation (Profit/Revenues)	Not Profitable
	Profitability without depreciation (Profit/Revenues)	28.77 per cent
	Percentage of depreciation in total expenses	45.81 per cent
	Percentage of operational revenues from training income	93.14 per cent
	Percentage of training income from long term courses	18.79 per cent
	Percentage of operational revenues from production (cash basis)	6.86 per cent
	Percentage of establishment and administrative and wages and salaries in total expenses (for 2009-10)	59.32 per cent
	Achievement of Financial Targets	• Training (number of persons trained) target achievement is 100.27 per cent • Revenue target achievement was 134.22 per cent
OUTREACH	Percentage of students in long term courses	11.70 per cent
	Percentage students in short term courses	88.30 per cent
	Percentage of MSMEs assisted (Revenue)	100 per cent
	No. of MSMEs assisted	267
	Achievement of Outreach Target	83.96 per cent of total clientele is MSMEs and persons trained are 1103 which is 100.27 per cent of the training target (number of persons to be trained)
	Specialisation in components	Tool-Room mainly catering to plastics, rubber and glass industry
	Specialisation in tooling	Moulds for plastics
INTERNAL	Manpower Strength	9

PROCESS	HR Incentive Policy-overall	HR Incentive policy is in place but is not availed by TRTC Guwahati
	Percentage utilisation of asset – critical machines (considering 2 shifts)	Being a training institute no organized data is collected
	Rejection (in Rs. Lakhs)	-
	No of Critical Vacancies	7
	Percentage Rework	-
	Effective Use of MIS	Tool-Room is not ISO certified
	Percentage of long term trainees placed	100 per cent
	No. of trainings conducted for staff/ trainers	-
CAPABILITY ENHANCEMENT	New Technologies Acquired/ New Specialisation developed	-
	Relevance to regional/ local industry	100 per cent production services are supplied within the state
	Cost recovery status	TRTC Guwahati has started recovering costs (without depreciation) for past 3 years.
	Autonomy	Tool-Room has achieved financial independence (without depreciation) only for past three years. It should be given higher autonomy when it recovers costs with depreciation.
	Capacity limitations	

Leverage points

- TRTC is the most well equipped training centre in the NE region for training in tool-making and associated trades. It has also developed training programmes based on the needs of the industry of the region.

Pressure points

- It does not have equipment and manpower for production. While some job work, tool parts included, is done as a part of training by the trainees, TRTC can make contribution in the development of MSMEs of the region with a separate production section. TRTC's employee strength is only 9. There are no promotional avenues for them. A study should be carried out for TRTC market for training and production services and its requirements of equipment for production section and manpower needed.
- Systematic approach to SOPs is lacking. It does not have ISO certification. It should go in for this certification after operating procedures are standardised. This should also include post placement tracking of trainees.

Areas of focus

- Industry in the NE region is developing. Medium units have their captive Tool-Room, although very simple in nature needing assistance in design and precision machining from Government Tool-Room. Likewise there are small workshops which also fabricate crude tools and, given the assistance, could upgrade their operations. This could be a good market.

Central Institute of Hand Tools, Jalandhar

Perspective	Performance Indicator	Description
FINANCIAL	Revenue in 2010-11 (Rs. in lakhs)	298.78
	Revenue mix	• Production -38.02 per cent • Training- 56.19 per cent • Others- 5.79 per cent
	Cash expenditure, 2010-11(Rs. in lakhs)	318.22
	Recovery percentage without depreciation	76.18 per cent
	Recovery percentage with depreciation	63.21 per cent
	Profitability with depreciation (Profit/Revenues)	Not Profitable
	Profitability without depreciation (Profit/Revenues)	Not Profitable
	Percentage of depreciation in total expenses	17.03 per cent
	Percentage of operational revenues from training income	59.64 per cent
	Percentage of training income from long term courses	9.36 per cent
	Percentage of operational revenues from production (cash basis)	40.36 per cent
	Percentage of establishment and administrative and wages and salaries in total expenses (for 2009-10)	85.62 per cent
	Achievement of Financial Targets	• Long-term training (number of persons trained) target achievement is 86.21 per cent • Short-term training (number of persons trained) target achievement is 110.51 per cent • Production target achievement was 56.80 per cent • Training target achievement was 90.26 per cent
OUTREACH	Percentage of students in long term courses	5.75 per cent
	Percentage students in short term courses	94.25 per cent
	Percentage of MSMEs assisted (Revenue)	--
	No. of MSMEs assisted	2982
	Achievement of Outreach Target	99.27 per cent of total clientele is MSMEs and persons trained are 2175

		which is 108.75 per cent of the training target (number of persons to be trained)
	Specialisation in components	Forgings and Forging dies for hand tool industry
	Specialisation in tooling	Forging dies, forging of hand tools, pipe fitting and general engineering items
INTERNAL PROCESS	Manpower Strength	60
	HR Incentive Policy-overall	HR Incentive policy is in place but is not availed by CIHT Jalandhar
	Percentage utilisation of asset – critical machines (considering 2 shifts)	28 per cent 42 per cent capacity is calculated in 2 shifts
	Rejection (in Rs. Lakhs)	0.28
	No of Critical Vacancies	-
	Percentage Rework	0.98 per cent
	Effective Use of MIS	Tool-Room is not ISO certified
	Percentage of long term trainees placed	100 per cent
	No. of trainings conducted for staff/ trainers	16
CAPABILITY ENHANCEMENT	New Technologies Acquired/ New Specialisation developed	Forging for hand tools by Press
	Relevance to regional/ local industry	99 per cent production services are supplied within the state
	Cost recovery status	CIHT Jalandhar has not recovered costs (both with and without depreciation) for past 5 years except for FY 2008-09 wherein it recovered cost without depreciation
	Autonomy	Tool-Room has not achieved financial and should be given higher autonomy when it recovers costs with depreciation
	Capacity limitations	

Leverage points

- Expertise in design and development of hand tools.
- Expertise in design and manufacture of forging dies, trimming dies, blanking dies, gauges and jigs and fixtures needed for manufacture of hand tools.
- Expertise in training workers and supervisors in the development of hand tools and manufacturing process to produce the same. This includes training courses in the design and manufacture of production aids needed by hand tool industry.

Pressure points

- Lacks expertise in the design and manufacture of moulds for plastics, die casting dies and press tools for auto component industry. Machines to make such tools were provided some time back but employees have not been trained in design of such tools and use of CNC machines to manufacture them.
- Lack of expertise in making moulds for sports industry concentrated in the city.
- Lack of good operating procedures. ISO certification has been withdrawn.

Areas to focus

- Abundant market for moulds from sports industry concentrated in the city and auto component industry.
- Private commercial Tool-Rooms need to use Tool-Room facility to upgrade their operations.



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Strategic Assessment of MSME Tool Rooms

Action Plan Report and Recommendations

Prepared for

Micro, Small and Medium Enterprises

Umbrella Programme



Knowledge Partner:



Grant Thornton

Contents

	Page
Section A: Background	5
Key Recommendations	6
Part I - Strategic	7
Recommendation 1: Adopting Market Development Approach	7
Recommendation 2: Rapid Scaling up of Training Output	10
Recommendation 3: Incentivizing Technology Upgradation of Private Sector MSE Tool Rooms	12
Recommendation 4: Introducing Innovative Technologies	13
Recommendation 5: Creating an Institutional Mechanism for Strategic Direction and Scaling Up	14
Part II: Enabling	18
Recommendation 1: Development of Procurement Manual and Standard Bidding Documents	18
Recommendation 2: Develop an Integrated FMIS	18
Recommendation 3: Holistic Performance Measurement/ Targets	19
Recommendation 5: Allow another Golden Hand Shake / Voluntary Retirement Scheme	20
Recommendation 6: Market Gap Assessment for Tooling and Tooling Related Skill Development Services	21
MI Stool	22
Holistic Approach: Financial and Non-Financial Measures	22
Alignment of Strategy of Each Tool-Room to the Overall Vision	23
Aspects of the MIS tool	24
PART III: Recommendations for individual Tool-Rooms	31
Central Tool Room, Ludhiana	31
Central Tool Room and Training Centre, Bhubaneshwar	31
Tool Room and Training Centre, Guwahati	32
Central Institute of Tool Design, Hyderabad	32
Indo-German Tool Room, Indore	32
Central Institute of Hand Tools, Jalandhar	33
Indo-Danish Tool Room, Jamshedpur	33

Central Tool Room and Training Centre, Kolkata	33
Indo-German Tool Room, Ahmedabad	34
Indo-German Tool Room, Aurangabad	34
Annexure 1	36
Annexure 2	38
Annexure 3: List of Suggested Long-Term Training Courses	40
Annexure 4: Weights and measures of the MIS tool	41

Section A: Background

GIZ, under its MSME - Umbrella Programme, is supporting the DC-MSME in review of their existing Tool Room Programme with an objective to evaluate the long-run performance; recommend improvements for increasing impact, services, outreach and revenues; and define a time-bound action plan to implement the improvements. Grant Thornton was engaged by GIZ to undertake the strategic assessment and suggest recommendations towards this objective.

Grant Thornton undertook in depth assessment of ten MSME tool rooms under the programme on aspects like financial performance, output, internal processes, impact, outreach, capability, etc. The performance was analysed against the backdrop of market opportunity and emerging needs of the tooling industry as well as MSMEs to develop way forward and recommendations. Assessment reports for each tool room as well as consolidated for the tool room programme as a whole are separately available. This report should be read in conjunction with individual reports and overall strategic assessment report.

The following chapters present strategic recommendations for the tool room programme as well as way forward for each tool room based on the strategic assessment.

Key Recommendations

The competitiveness of the manufacturing sector is critical for sustaining economic growth and major growth oriented manufacturing sub-sectors depend heavily on tool room capabilities for generating value. During the early phase of industrialization in the country, development of infrastructure for TDM design and manufacture as well as training of tool makers was needed. Advanced equipment and expertise was required hence, Government of India through technical co-operation both under bilateral and multilateral programmes established tool rooms. These tool rooms were mandated to produce TDM for MSMEs and train manpower for the tool room industry.

Over the years, significant capacity has been created in the private sector with mushrooming of commercial and captive tool room facilities. While these facilities have benefited from the tool rooms established under bilateral and multilateral cooperation by way of trained manpower, demonstration of technologies, etc, there is need for enhancing their capacities and capabilities to match the industrial growth. Out of the 1500 estimated commercial tool rooms operational in the country majority are micro and small scale enterprises with obvious limitations. Further, the skill gap for the tool room industry is large and increasing with the increase in TDM demand. It is estimated that the tool room industry would need additional 85,000 to 90,000 skilled tool makers over the next 3-4 years and this does not include the skill required in the downstream tool using manufacturing sub sectors like Auto components, plastics, electrical goods, capital goods, etc which would be in millions too¹. Last but not the least, the micro and small scale enterprises in the manufacturing sector do not have awareness about the need for precision tooling requiring major capacity building effort. The regions where industrialisation is beginning to get a foot hold like Assam, Orissa, etc would need support of Government tool rooms in the region to produce TDM for the industries.

Over the last few decades, the tool room programme of the MoMSME has made significant impact in developing TDM capacity in the country. The contribution in terms of developing human resource, introducing precision technologies and serving the MSMEs has paid tremendous dividends to the economic development process. Considering the developmental gaps discussed in foregoing paragraphs, the programme merits continuation over the 12th plan period albeit with a new paradigm shift to focus on advancing private sector TDM capacities. This strategy would improve outreach and sustainability of the good work carried out so far. Accordingly, given below are the key recommendations, for going forward, for the MoMSME tool room programme. The recommendations are at following three levels:

1. **Strategic** – directed at policy changes required to reorient the tool room programme for greater impact and outreach
2. **Enabling** – directed at bringing greater efficiency and effectiveness in programme implementation

¹ As a broad estimate, tool room industry employs 8-9 skilled workers (2 EDM operators, 2 CNC operators, 2 persons for Assembly, 1 CAD/CAM Engineer, 1 other) for a turnover of Rs 1 crore. The present growth trend aims at additional industry turnover of about INR 10,000 crores creating a demand for additional 80-90,000 skilled tool makers.

3. **Individual Tool Room** – specific recommendations for a tool room to improve its contribution towards overall programme goals and objectives.

Validation Workshop: Draft report including recommendations was discussed over a validation workshop organised by GIZ on 28 and 29 November 2011. All the General Managers from ten tool-rooms and officers from Tool Room Division of office of DC MSME participated in the workshop. Their specific concerns with respect to each recommendation are also incorporated below.

Part I - Strategic

Recommendation 1: Adopting Market Development Approach

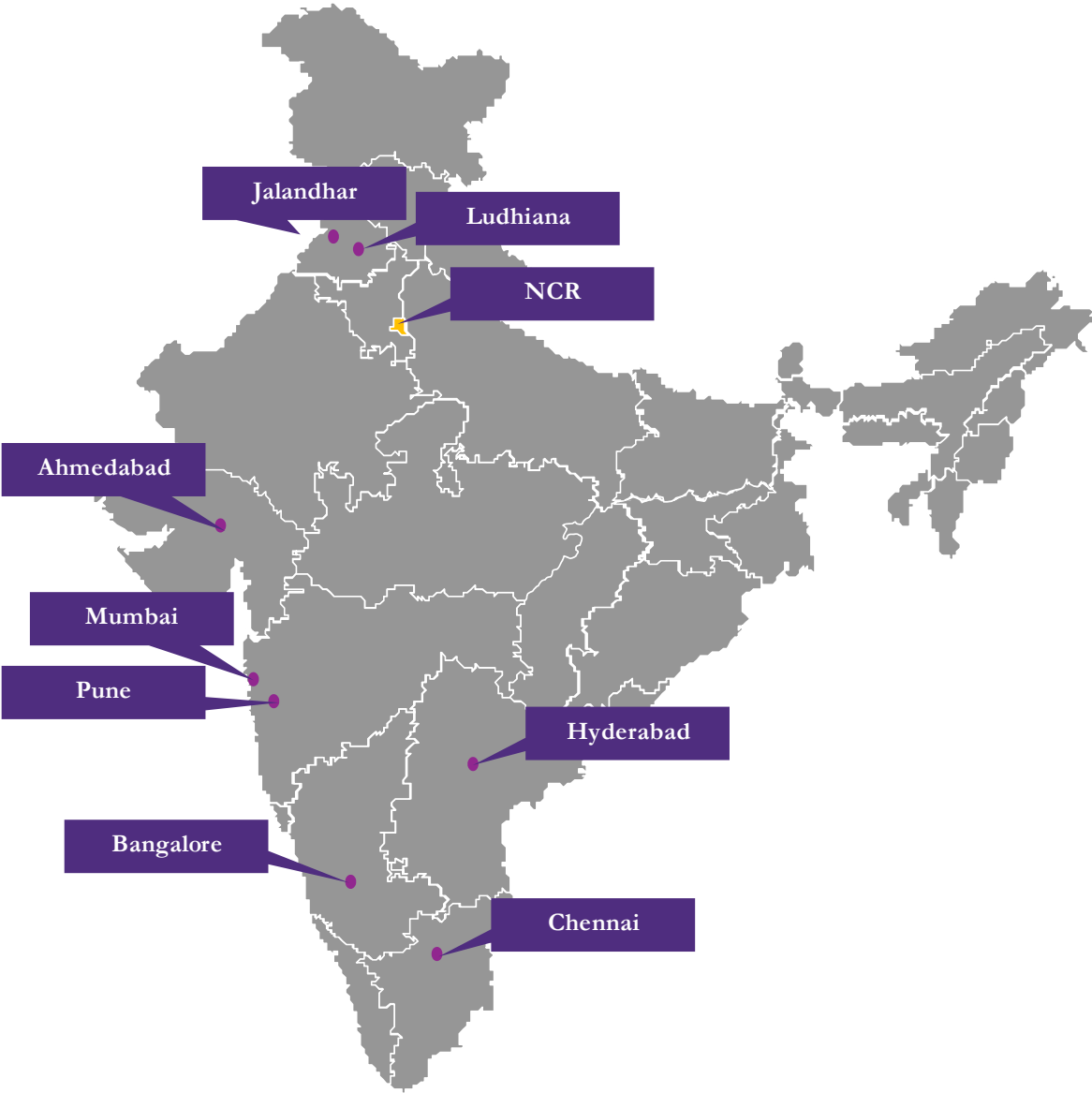
Context: Given the capacity constraints in the private sector, the tool room programme may consider adopting market development approaches which suggests that it is not always necessary to intervene directly with the beneficiaries to bring them benefits. Since the TDM market has reached a critical mass, along with direct interventions, support to private sector would be required. Along with direct selling of TDM by the Government assisted tool rooms, the private entrepreneurs who are trying to fulfill these functions in a commercially viable manner may also be assisted. Many of these entrepreneurs are in the MSE segment and do not have the knowledge or infrastructure available with the Government tool rooms and can be supported towards that. Also, greater impact can be achieved indirectly by working with existing market players or intermediaries. The reasons for this include the high cost of interacting directly with large numbers of MSMEs and the lack of sustainability of this kind of intervention. The approach is quite effective as it is based on the principle that the market players (private tool rooms) would be sustainable if they make profits and thus the impact is sustainable. Moreover, the outreach would be many times more than what can be achieved directly. There would be large-scale and sustainable benefits for the MSMEs without intervening directly with them.

It would be important for the tool room programme to identify win-win relationships with private MSE tool rooms where all parties benefit. In this way, the relationships and corresponding benefits to both parties will continue beyond the project activities. It is important, however, to carefully select the private sector players that the project will work with – to insure that they are capable of creating win-win partnerships with the MSMEs.

In order for tool room staff to identify opportunities to build and strengthen such relationships they would need reorientation. They need to look at larger impact that the revenues generated by their respective tool rooms and understand the critical role which the market players can play in impacting competitiveness of the MSMEs. They need to focus on:

- how to increase and improve the participation of MSE tool rooms; and
- how to monitor the impact which is achieved of this indirect intervention

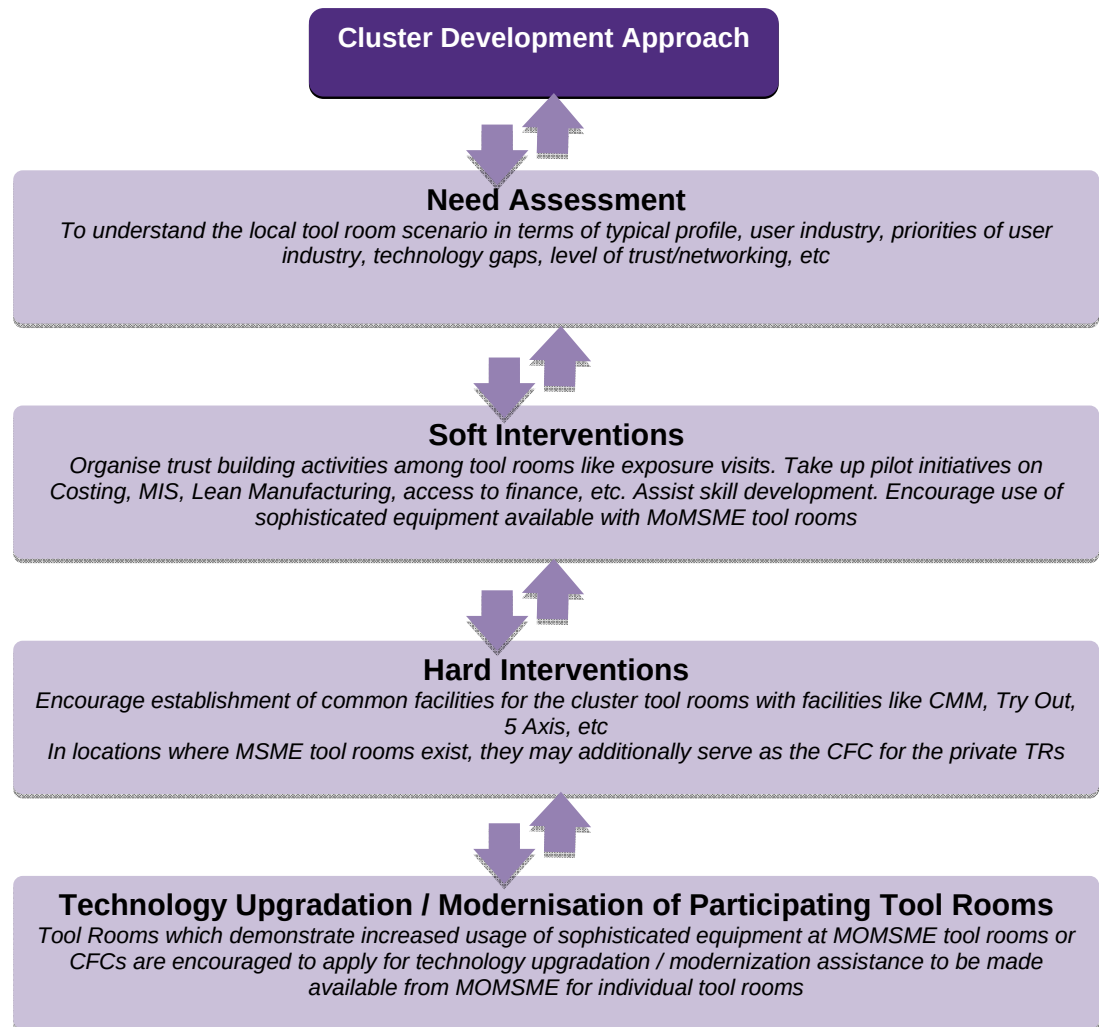
Operational Plan: While there are commercial tool rooms in every industrial city of the country, there are some major clusters of commercial tool rooms in Ludhiana, Jalandhar, Bangalore, Mumbai, NCR, Chennai, Ahmedabad, Mumbai, etc. The map with major commercial tool room concentrations is given below. These clusters may be adopted under the MSE-CDP of MoMSME for soft and hard interventions. Small pilot activities may also be initiated in other cities to sensitise and network the tool rooms in close geographical proximity.



Pilot Project: A pilot activity on the above recommendation could be started at one Tool-Room and, after assessment of its success, extended at other clusters. DC MSME may decide on the cluster where pilot project should be started. One of the following is recommended:

Tool Cluster in and around	Nodal Tool-Room
Hyderabad	Central Institute of Tool Design, Hyderabad
Pune	Indo-German Tool Room, Aurangabad
Ludhiana	Central Tool Room, Ludhiana
Ahmedabad	Indo-German Tool Room, Ahmedabad

The operational plan for the intervention on cluster development of tooling industry is illustrated below:



Key Activities: Following would be the key activities to be undertaken in this context:

1. **Training / Orientation of Tool Room Staff on Cluster Development Approaches:**
Most of the tool room officials are not acquainted with the approach and tools for cluster

development. A dedicated training programme for the nodal persons for this activity from each tool room should be designed and implemented.

2. **Develop a model tool room cluster:** Alongside training on cluster development, it would be important to demonstrate the approach and tools to the participants through actual implementation. A professional agency with experience in cluster development may be engaged to demonstrate development of a model tool room industry cluster. It would involve creation of networks of commercial tool rooms and undertaking pilot initiatives towards capacity building and competitiveness enhancement.
3. **Modifying MSE-CDP for tool room cluster:** There are certain clauses in the MSE-CDP guidelines which may need to be modified or relaxed for the tool room clusters e.g. as regards minimum number of cluster enterprises - a tool room cluster with 20-25 tool rooms may be considered eligible and SPV requirement may be minimum 5 tool room members. Regarding soft interventions, international trainings may be encouraged as also incentives to the user industry (MSMEs) to use services of commercial tool rooms. However, these would be need based.
4. **Discount / Voucher Assistance to MSEs that use Services of Assisted Commercial Tool Rooms:** Given that the MSEs are usually price sensitive and lack knowledge about the importance of precision in tooling, it may also be necessary to incentivise them to procure their TDM from assisted commercial tool rooms. These MSEs may be given discounts / voucher assistance for TDM which involve precision and complexity on the same lines as MoMSME tool rooms do, such discounts should be reimbursed to the tool rooms upon delivery of TDMs. The assistance should be graded and tapered over a pre-defined period. The assistance is expected to develop market (both demand and supply) for precision tools, the real impact would be in terms of educating the MSEs on the advantages of precision tooling and commercial tool rooms about the behaviour of MSEs.

Recommendation 2: Rapid Scaling up of Training Output

Context: Manufacturing sub sectors from auto to apparel need tool makers. There is requirement of skilled workforce which is many times the output currently produced by the tool room programme and private players like NITTF. Scaling up in quick time is the need of the hour as delay would only pile up the demand. Given that tool making is mainly hand on training on capital intensive infrastructure, rapid scaling up is possible only through increased participation of the private sector and existing polytechnics, ITIs, etc which can provide infrastructure.

During the visits to various tool room locations, the industry expressed their willingness to participate in skill development through provision of their machines for practical training. They were also willing to provide trainers for the purpose. In addition, there are various funding sources available like NSDC which can be leveraged to scale up. The course content is readily available with all tool rooms, they need to convert that into multimedia modules for large scale training. The existing staff would need to develop quality assurance skills to ensure that decentralised training is effective.

The German vocational training has emerged as an interesting model for skill development involving multiple stakeholders. The essence of the quality is that German products exhibit the skill

level of its industrial workers. Their high skill levels are a direct result of the country's vocational training programs, more commonly referred to as the dual educational system. In Germany about 75 % of those between the ages of 15 and 25 undergo vocational training. This highly successful vocational training system relies on the support of many organizations - Employer associations, on both sectoral and local levels, play a major role in developing new courses, in modifying existing ones, and in advising the larger companies offering apprenticeship.

The characteristic feature of this system is that the provision of knowledge and skill is linked to acquiring the necessary practical skills on the job. It ensures that the training will proceed under the same conditions that the trainees will encounter when practising his chosen occupation. The training is provided on the job and in the vocational training schools. It is referred to as the dual system, practical training is given as apprentice at a factory and backed by theoretical training in the vocational school.

The most interesting aspect is the win-win relation between the vocational school, employer and apprentice. The vocational schools leverage on industry knowledge and infrastructure, industry participates as they want to get skilled manpower and apprentices take low wages during apprenticeship as their commitment towards the programme.

Operational Plan

Instead of further significant investments in MoMSME Tool-Rooms, *Hub and Spoke* decentralized model of training may be adopted to leverage infrastructure and knowledge available with the private sector / employers. NTTF is a case in point. NTTF has 7 centres where infrastructure is provided by the industry and there is a revenue sharing model between the industry and NTTF. Greater participation of employer industries in content, assessment, trainers and tracking should also be encouraged. These policies will call for limited investments in infrastructure, leveraging infrastructure, synergies and plant & machinery available with the Tool-Rooms and the industry.

For scaling up, it is proposed that Tool-Rooms should aim to double up the trainee output over the next 2-3 years, 50% of which should be in-house and balance by leveraging the industry infrastructure. The increase should have special focus on long-term courses - duration of 1 year and more. The focus on long-term courses is essential as it directly contributes to the skill gap in the TDM segment and generates employable skills. Short-term courses are mainly important for imparting additional skills to existing workers or practical training to students. Infrastructure for this scaling up will also be available for scaling up the short-term courses.

Key Activities

1. **Train the Trainers:** The ten tool rooms employ about 200 people in the training activity. Considering the scaling up proposed, large number of trainers would be required for decentralized training. Sharpening of skills of existing trainers is also required to disseminate

NTTF Case Study

- Trains about 12,000 persons in long duration programmes (3 years or more)
- Do not get any grant or subsidy, earn from training fee
- Revenue of RS 60 crores/annum from training (reinvest 40%)
- Have 12 locations for tool making related training
 - 5 self - owned
 - 7 established by industry with all infrastructure
 - 50% output from industry sponsored centers
- Faculty, selection, training, quality assurance by NTTF
- Revenue sharing model with industry partners (40:60)

new methodologies and use of training aids (multi media). This should be an ongoing activity. It should be set up at one of the tool-rooms. In addition to its own specialized faculty from other tool-rooms, NTTF or other institutions of excellence should be extensively used.

2. **Develop Revenue Sharing Model to Leverage Industry Resources:** Many medium and large industry groups are willing to provide the physical facilities for training while the Tool-Rooms deploy their faculty on conduct training. An appropriate revenue sharing model may be designed. This can feed the needs of that particular industrial unit and other nearby units. This keeps Tool-Rooms investment extremely low and they still contribute in meeting the manpower needs of the Industry.
3. **Develop SOPs and Multi Media Modules:** Decentralised training has its own challenges especially with regard to quality management. To address these concerns it would be important that the tool rooms develop multimedia modules where reliance on trainer is reduced to a great extent. In addition, the tool rooms should develop SOPs for training quality assurance.
4. **Incentivise Industry Partners to Provide Training Infrastructure:** Tool-Rooms now have started deputing their trainees to industrial units as a part of curriculum. The practice may not be left to the last year but should be an ongoing one throughout the training. The vocational schools leverage on industry knowledge and infrastructure, industry participates as they want to get skilled manpower and apprentices take low wages during apprenticeship as their commitment towards the programme. To encourage such industry partnerships appropriate incentives may be necessary. Support for curriculum, selection, assessment, etc would also be required.

Key Concerns: Enhancement of training output in long-term courses calls for significant capital investments and private industry may not participate. The hub and spoke model would require additional skills of monitoring, decentralised training delivery, train the trainers, etc. Similarly, revenue sharing with industry may be required to leverage infrastructure available with them which has its challenges given there is limited experience in this context and documentation to engage private players would be required to place appropriate safeguards.

Recommendation 3: Incentivizing Technology Upgradation of Private Sector MSE Tool Rooms

Context

More than 95% of the private tool rooms are in the MSE sector with obvious constraints in terms of technology sophistication, skilled manpower, financial resources, process upgradation, etc. The sector is strategic for increasing the share of manufacturing GDP to 25% but at the same time the low return on investments, high technology obsolescence, knowledge driven characteristics are a hurdle in the growth of this industry. Considering that these tool rooms can directly impact competitiveness of the manufacturing sector financial assistance for upgradation and development of tool rooms is justified.

Operational Plan

The scheme of CLCS is available for the purpose. However it needs modification in terms of (i) Industry coverage to include Tool-Room industry, (ii) list of eligible machines and (iii) level of assistance should be higher as Tool-Room machines are more capital intensive. In its present form it does not include Tool-Room industry as such. Some machines needed for tool making are included in the list of machine covered by the scheme for Plastic and Machine Tool industries to improve their captive Tool-Rooms. The level and procedure of assistance under TUFs of Ministry of Textiles, Modernisation scheme of MoFPI and ILDP of DIPP, Ministry of Commerce may be

considered for revision. The tool rooms that participate in the market / cluster development programme and demonstrate heavy use of sophisticated equipment over a period of 12 to 18 months may be considered eligible upon technical assistance on latest manufacturing processes / techniques, management systems and upgradation of existing workers. Soft loan / Interest subsidy or grant assistance for procurement of sophisticated TDM machinery and testing equipment like CMM may be assisted under the scheme.

Key Activities

1. **Review of CLCSS:** The scheme guidelines may be revised in consultation with stakeholders like TAGMA, Commercial Tool Rooms, banks, etc. The total outlay of the scheme for the 12th plan can also be estimated in consultation with the stakeholders. Existing schemes that are in operation for modernization / technology upgradation in respective sectors like ILDP, TUFs, etc may be studied to see type and effective level of assistance and implementation plan.
2. **Preparation of list of eligible plant and machinery under the scheme:** It would be critical to identify plant and machinery which would be eligible for the scheme assistance. The list may indicatively cover following machines like CNC Wire Cut, CNC EDM, CMM, Jig Boring, Jig Grinding, etc

Key Concerns: There is no detailed survey available about the status of technology / processes adopted by the MSE tool rooms in the private sector which should be a prerequisite for any decision in this regard. Assistance to private tool-rooms may not help MSMEs as they may supply tools to large scale units. Also they will start competing with Government Tool-Rooms in quoting prices.

Recommendation 4: Introducing Innovative Technologies

Context

MSMEs need access to advanced technologies, on an ongoing basis, to move up the value chain, to secure higher value contracts and remain competitive. These technologies are becoming more and more relevant for the growth of MSMEs in view of shorter product life cycles and faster deliveries demanded by the OEM. However, given that the technologies are new, the level of risk is higher and MSMEs are not sure of commercial viability of these technologies. The MoMSME tool rooms may procure these technologies, demonstrate their commercial viability and train manpower for disseminating the technologies to the MSMEs. This has been successfully undertaken by several MoMSME tool rooms in the past like Jalandhar (forging hammers) and Ludhiana (heat treatment). They are also a source of revenue for the tool rooms in addition to the strategic value of enabling faster growth of manufacturing MSME.

Operational issues

Tool-Rooms at Aurangabad, Bhubaneswar and Jamshedpur have made their expansion plans for next five years which have been approved. In addition to horizontal expansion, these also include up-gradation CNC technology to 4 and 5 axis. However Tool-Room family should adopt new technologies as they advance in the manufacturing world to keep pace with present developments. This may be addressed by a Special Purpose Vehicle(SPV), the nature and structure of which is elaborated in Recommendation 5. These technologies were identified during the study. Innovative technologies must be introduced selectively at Tool-Rooms depending upon their local relevance, capacity of Tool-Rooms to absorb the technology and management competencies to train manpower on these technologies, put it to maximum use and demonstrate commercial viability. These are accordingly elaborated under specific recommendations for individual Tool-Rooms.

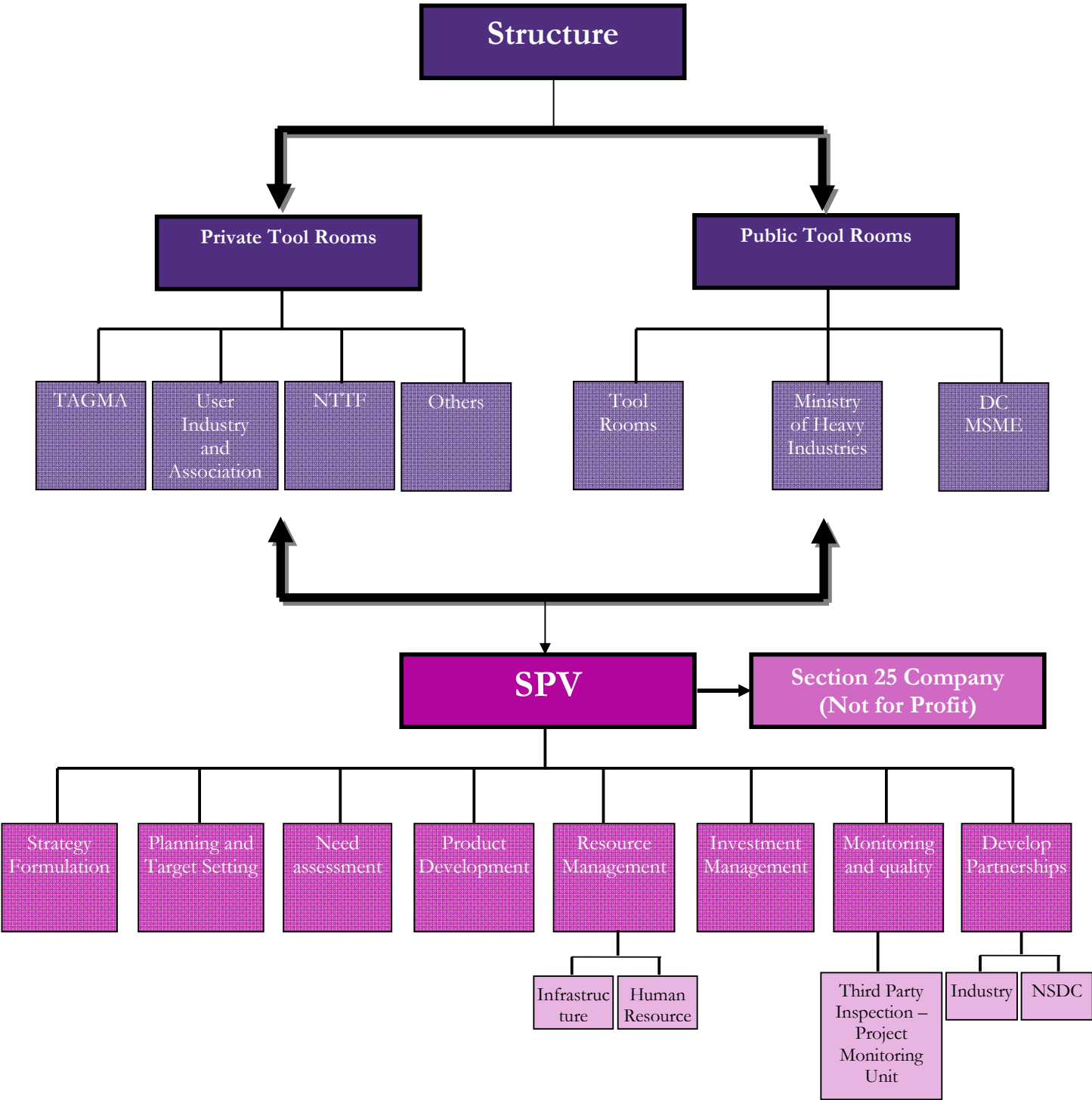
Recommendation 5: Creating an Institutional Mechanism for Strategic Direction and Scaling Up

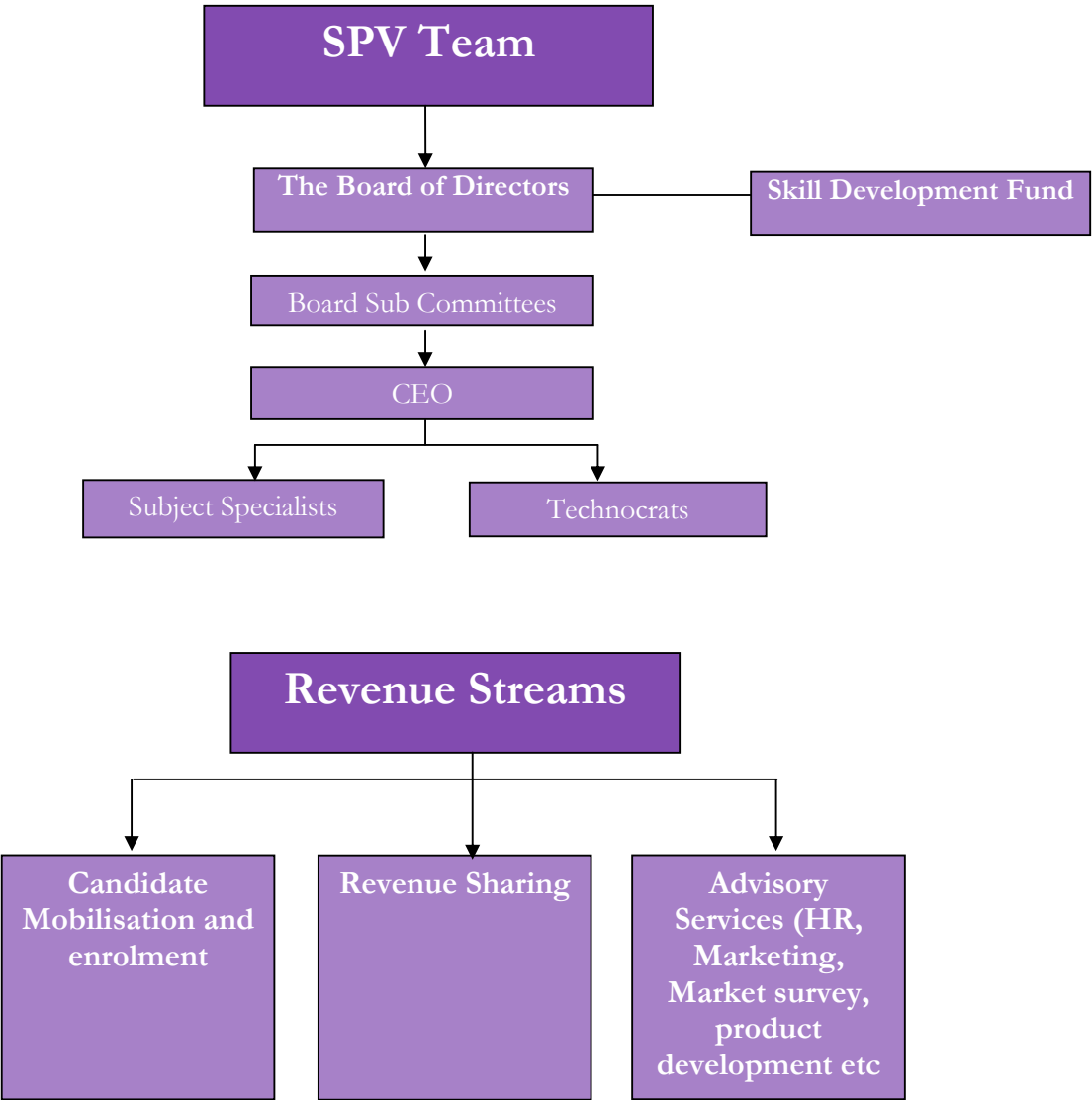
Context

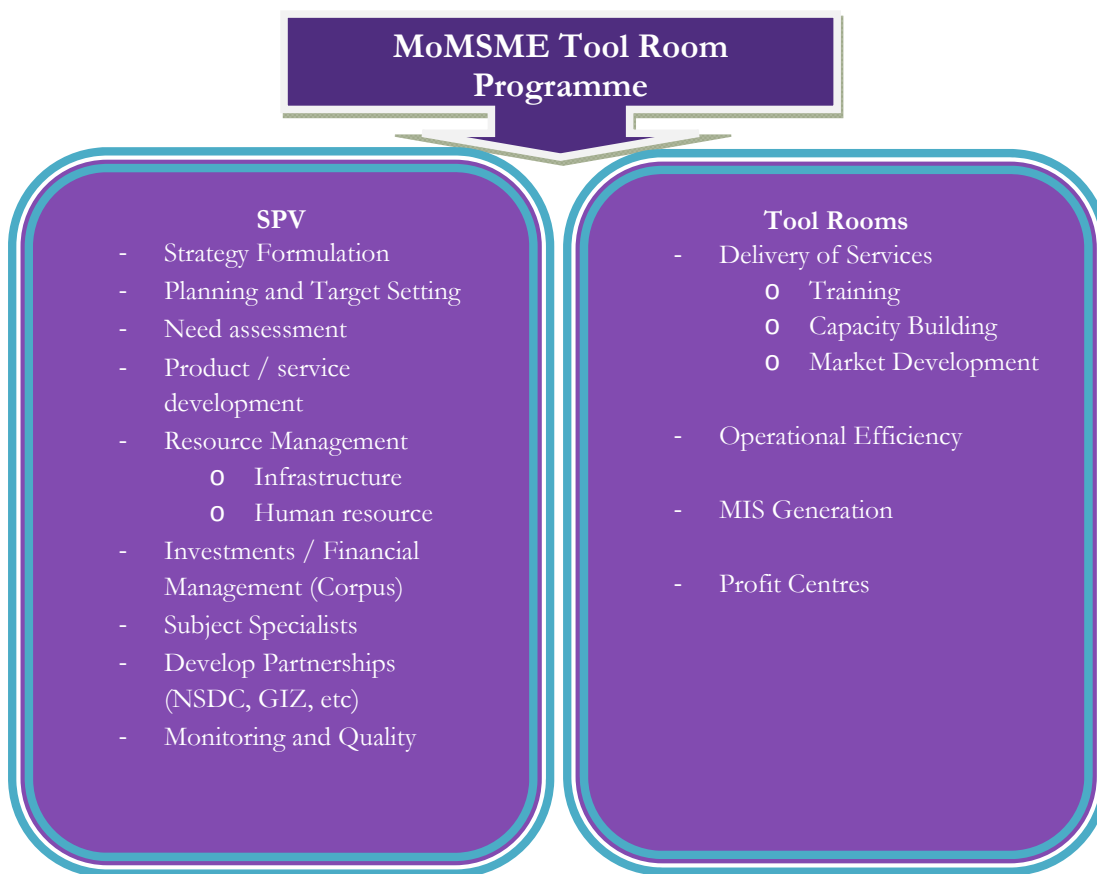
Tool Rooms are autonomous societies under the DC MSME with each having its independent governing council for overall strategy and direction. The office of DC MSME is useful in bringing synergy and coordination among the tool rooms but the structure has several critical limitations. One of the major limitations is with respect to continuity of strategic input and alignment of objectives with the overall strategy. Another major limitation of the structure is that it does not allow engagement of subject specialists which can serve as a common resource for all tool rooms and not required separately at each tool room. Moreover, the tool rooms compete with the private sector to retain talent which is difficult with the present structure. Several other advantages of networking among tool rooms are also not optimally exploited in terms of infrastructure, expertise, knowledge, linkages, best practices, forging partnerships, etc. It is with above context it is recommended that an institutional mechanism is established which addresses the above constraints while retaining the entrepreneurial strengths of the programme.

Operational Plan

It is proposed that the delivery is separated from strategy formulation, planning, product development, resource management and quality assurance. The tool rooms retain autonomy in delivering the services while for strategy formulation, synergy, investments, etc a Special Purpose Vehicle is promoted. The SPV may be a Private Public Partnership with industry participation. The SPV may be a corporate body; given the development mandate, a section 25 (not for profit) company may be more appropriate. The corporate structure would improve governance as also bring greater transparency and accountability. The SPV would have a business plan of its own, with initial corpus or seed capital from the MoMSME it would be self sustaining earning revenue from its services to tool rooms and/or having revenue sharing arrangement with the tool rooms.







Key Activities:

1. **Detailing of SPV structure with roles and responsibilities:** upon broad agreement of the above structure, detailing would be required with respect to shareholding, corpus, business plan, roles and responsibilities, skill development fund and corpus, etc.
2. **Detailing the revenue plan for the SPV:** The SPV needs to generate its own revenue sources for sustaining its day to day operations. There are various such sources of revenue which need to be evaluated including sharing of fee from training, interest income from skill development fund, revenue from services like mobilization, industry linkages, placements, etc.

Key Concerns: Government Rules hinder the autonomy needed for performance at the expected level. There is no incentive for high performance. Recruitment and promotion rules and procedures allow less scope to promote talented and efficient employees. Leave rules provide much more holidays than what are provided in the private sector and General Managers cannot refuse leave even in exigencies of work. Purchase of machines need Government approval even when better performing Tool-Rooms have surplus funds from their own earnings. Performance can improve if HR policies are as per the market trends and more autonomy is given in functional areas.

Part II: Enabling

Recommendation 1: Development of Procurement Manual and Standard Bidding Documents

The objectives of developing the manual are:

- (a) simplify rules, practices and procedures for undertaking public procurement in the Tool Rooms
- (b) standardize procurement practices through the creation of a procurement manual that provides guidance to officials on how to undertake procurement and the creation of standardized bidding documents for use in procurement transactions;
- (c) improve the efficiency of business practices by developing clear rules and procedures for utilizing rate contracts, delineating and facilitating the use of alternate procurement methods and methods for enhancing technical oversight of large value contracts

It would involve following tasks:

Task 1: Engage a consultant for developing a comprehensive procurement manual that will inform the officials involved in procurement, on the improved procedures to be adopted for any given procurement, the documents to be used, and how the documents are to be tailored for a specific procurement. Key areas to be covered by the manual include –

- Principles of Procurement including Value for Money and whole-life costing principles.
- Delegation of authority in alignment with functional and operational needs and defined responsibilities
- Methods of sourcing suppliers
- Types of procurement for goods, civil works, services – professional and others
- Detailed Procurement Planning and documentation of processes for different types of procurement
- Detailed processes and procedures for alternate procurement via Rate Contracts, Long term agreements, Framework agreements, Emergency procurement procedures.
- Evaluation procedures under various methods of procurement

Task 2: Preparation of Standard Bidding and Procurement Management Documents (including Letters for Correspondence) for Goods, Works, and Services and various procurement types as well as for evaluation documentation. Preparation of detailed contract administration procedures including standard contractual templates (and SLAs) for different types of procurement of goods and services.

Task 3: Development of a detailed training plan for officials (short term and continual training) and training modules for use in instructing officials in conducting procurement. Carry out Training-of-Trainers for officials.

Key Concerns: Purchase procedures as per GFR inviting bids through the tender process and following the L1 principle for financial quotations, encourages bidders to quote low by compromising on quality. This also causes delay. Flexibility like that of a private commercial tool room is needed.

Recommendation 2: Develop an Integrated FMIS

While estimates are prepared for quoting and hours are allotted at various machining centres at the time of process planning, actual times taken at various cost centres generally exceed the estimated hours and, therefore, the cost estimates. A system to compare and analyse the cost estimates prepared at the time of quoting and actual cost on completion and analysis of reasons for deviations for futures guidance, should be implemented in all tool-rooms. Similarly data for machine cost

during the year should be captured on perpetual basis so that rates per hour of all cost centres are known. Also training and production costs should be captured on actual basis rather than on percentage basis, this will assist in understanding training costs. Design of IT enabled and integrated Financial and Management Information System (FMIS) is a requirement. Continual improvement and accountability can be enhanced through the use of FMIS which can be linked to a suitable reward / incentive system. Suitable training and capacity development of the staff is necessary alongside. Training plan and training modules for training of officials should be developed and training workshops at regular time periods can be organised to train the staff in preparing cost estimates.

Recommendation 3: Holistic Performance Measurement/ Targets

Monitoring of performance currently, is mainly on financial parameters and not as much on outreach and impact. Management efforts are hence directed accordingly. Production which was a major part of revenue earlier, is today down to a very small proportion. Even out of this small share of production related services, a significant portion is from component production for PSUs or large scale units. A clear reason that emerged from interactions with the stakeholders is that because of the present emphasis towards revenue generation the outreach to MSMEs and impact in the area of tooling stands diluted. Likewise, in training much of the initiative is towards summer vacation training of students pursuing engineering studies, which is not towards bridging the industrial skill gap faced by MSMEs. Annual targets are likewise fixed and performance monitored by the office of DC MSME. Monthly performance is reported by tool-rooms on the following parameters without any specific measures attached to each indicator. Further, target setting is critical which is not available for many indicators.

Sl. No.		Head	Description
1	Financial Measures	Revenue	Revenue from production
2			Revenue from Training
3			Revenue from bank interest
4			Revenue from other sources
5		Expenditure	Recurring Expenditure
6			Expenditure including depreciation
7		Cost recovery	Percentage cost recovery w/o depreciation
8			Percentage cost recovery i/c depreciation
9	Operational Measures	Lead times	Delivery on time
10			Delivery delayed
11		Rejection	Lost
12			Value of salvaging
13		Machine utilisation	A, B and C classified machines, separately
14	Outreach Measures	Trainees trained	Trainees trained in long-term courses
15			Trainees trained in short-term courses
16		Units assisted	MSMEs technology related assistance
17			MSME Routine job work assistance
18			MSME through manpower placement
19			All the above for other large scale

Recommendation 4: Incentivise Individual Performance / Revise Incentive Scheme: Tool-Rooms were allowed to adopt incentive scheme to improve performance from the year 2001-02. Scheme has been revised periodically, last in 2010. It is a group incentive scheme. The scheme lays stress on increasing generation of surplus of income over expenditure. Twenty to twenty five percent, depending on recovery status, of “Eligible Amount” is allowed to be distributed to the employees. There are restrictions on maximum amount payable, 3 month salary if a Tool-Room has recovered cost without depreciation and 4 month salary if it has recovered cost including depreciation. Distribution is further based on the following factors:

- Salary=Basic pay + grade pay +Dearness allowance subject to maximum sealing on basic pay of Rs.8560/- ; those with basic pay of more than Rs.8560/- are paid incentive based on Rs.8560/- basic pay (revised after implementation of 6th Pay Commission Recommendations)
- Number of days of attendance in the financial year over the Tool Room working days.
- Salary for this payment is taken as Basic pay + grade pay +Dearness allowance subject to maximum sealing on basic pay of Rs.8560/-
- Contractual and ad-hoc employees are covered also paid incentive based on the number of days they have worked and their wages.
- Ad-hoc and contractual employees are also covered, but at a different (Lower) scale.

“Eligible Amount” is operating income minus expenses if a Tool-Room has achieved sustainability. For Tool-Rooms which have not achieved it, eligible amount is reduction in excess of expenditure over income by more than by more than 10 % of best of previous three years. Employees of Tool-Rooms which have introduced this scheme are not paid bonus on the lines paid to central Government employees. The scheme has been accepted by employees of all Tool-Rooms who find it complex beyond the comprehension of common workmen and the uncertainty of any payment or payment less than the bonus if performance falls. There is a case of revisiting the scheme as below.

- ✓ Restriction of 3 or 4 month salary should be removed once incentive has been earned based on percentage factors
- ✓ Whole allocable amount should be paid. Attendance factor should only mean, reduction for some employees with less attendance and increase for others with better attendance
- ✓ Bonus payable on lines of central Government employees should be assured. The present position is that employees having accepted incentive scheme and falling short, even marginally, in a year will not be paid anything but employees where incentive scheme has not been accepted will be paid the bonus even with much less recovery ratio.

To retain talent, it is recommended that the incentive programme starts recognising and rewarding individual performances along with group performance. The incentive should be based on performance at 3 levels - overall performance of the tool room, of the respective profit centre (training, production, consulting, etc) and finally of the individual. Availability of an integrated FMIS, recommended separately, is required to be in place to implement such a system with transparency.

Recommendation 5: Allow another Golden Hand Shake / Voluntary Retirement Scheme

Establishment and administrative expenses constitute 72 % of total recurring expenses, salary and allowances form a major part of it. Contractual technicians and other casual employees cost less than half of regular employees. Government had allowed VRS to Tool-Rooms which reduced some avoidable expenses on account of establishment. It is recommended that DC MSME might allow another round of VRS in Tool-Rooms especially in old Tool-Rooms like Hyderabad, Kolkata and Ludhiana where employees are now very senior in number of years and are at very high basic pays due to promotions and ACP allowed by the Government and are not proportionately contributing to revenues.

Recommendation 6: Market Gap Assessment for Tooling and Tooling Related Skill Development Services

Given that there are private players in the market offering similar services to tool rooms, it may be necessary to undertake a detailed market gap assessment of tooling and tooling related skill development services. This will be strategic to decide the role that tool room programme should assume in coming years in terms of building capacities in the private sector. Following could be the broad objectives of the study:

Objective would be to assess and analyse:

- The demand of skilled manpower for tooling and related services along with supply side capacities and constraints.
- the demand for specific tooling services from MSME and their source of supply along with their capacities and constraints

Scope:

- Identify key sectors that use tool room services in India based on secondary data (also relevant from the point of view of MSME tool room locations, usage of services, significance of MSMEs in the sector and prospects for continued growth in the future).
- For each location where there is presence of MSME tool room, at least 250 MSME/sector are surveyed for demand assessment.
- To assess the supply side all (public/private) service providers will be mapped and at least 50% (not exceeding 50/sector) of such local service providers will be surveyed.
- Identify capabilities and constraints of the supply side for both skill development and tooling services.
- Skill sets required should be assessed both qualitatively and quantitatively for different sub segment and processes.
- Co relate the above findings with MSME tool room findings (SWOT , current and future potential) to draw recommendation and actionable implementation plan such as
 - Role of MSME tool room in terms of its focus on service provisioning
 - Action plan for MoMSME w.r.t fulfilling skill gap related with tooling and development of private commercial tool rooms
 - Specific recommendation for existing tool rooms to further strengthen and enhance its skill development and capacity building programmes

MI Stool

The proposed MIS tool is an attempt to translate DC-MSME's vision and strategy for the Tool-Room programme into a comprehensive set of performance measures that provides the framework for a strategic measurement and governance system. It will facilitate an understanding of goals and methods for attaining those goals. The tool will track past performance of Tool-Rooms while simultaneously monitoring progress in building the capabilities and intangible assets needed for sustainable impact. It retains emphasis on financial objectives but also includes the performance drivers of these financial objectives.

The Tool-Room Programme can potentially impact the manufacturing GDP of the country in a significant way through increased outreach and capacity building of the private sector. This would essentially be knowledge driven and not merely deploying new technologies through sophisticated physical assets. The programme's ability to mobilise and transfer intangible assets will be far more decisive in achieving desired impact on stakeholders than physical assets. These intangibles would be useful towards:

- Improved outreach
- Improve the capacity and capability of private tool makers and trainers in serving MSMEs more efficiently and effectively
- Introduce innovative technologies and services to enhance competitiveness of MSMEs
- Mobilise employee skills and sustain their motivation to assist MSMEs
- Develop and train private sector players in market led skill development programmes

Holistic Approach: Financial and Non-Financial Measures

At present, the measurement system for Tool-Rooms is largely financial. Financial measures are inadequate for guiding and evaluating Tool-Rooms' impact. Periodic financial statements and financial measures must continue to play an essential role in reminding the Tool-Room employees that improved revenues, efficiency, profitability, etc. are means to an end, not the end itself. Such improvements value only when they can be translated into improved impact on MSMEs, skilling of manpower and overall growth in the manufacturing GDP.

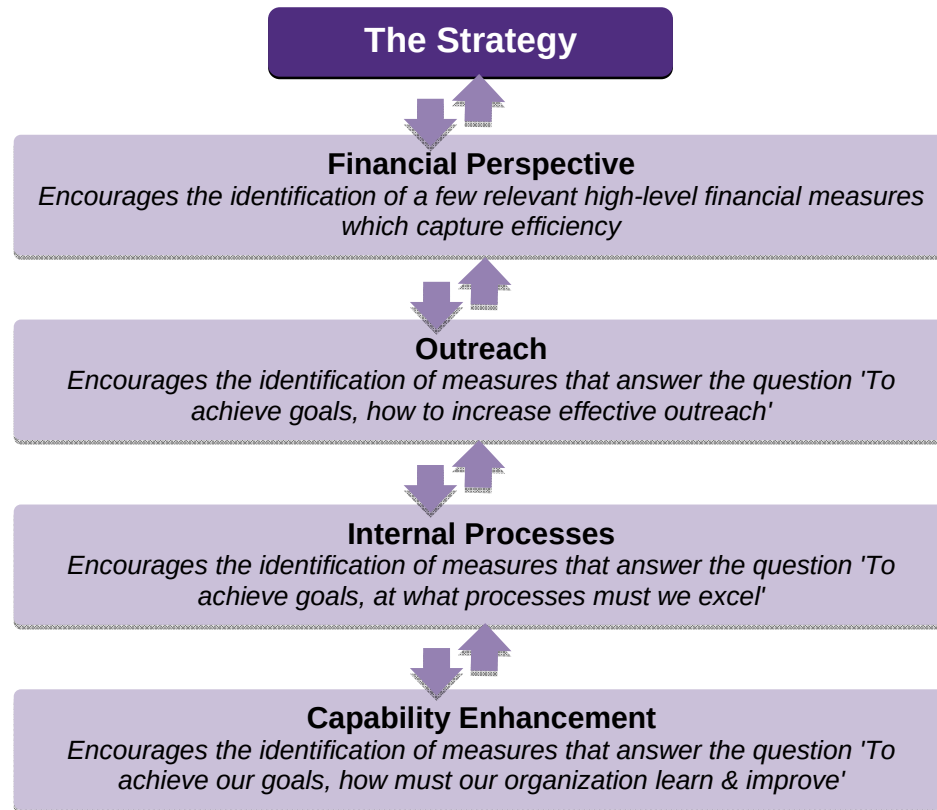
The financial measure tells some, but not all, of the story about past actions and they fail to provide adequate guidance for the actions to be taken today and the day after to create future financial value. An overemphasis on achieving and maintaining short-term financial results can cause Tool-Rooms to over invest in short-term fixes and to under invest in long-term value creation, particularly in the intangible and intellectual assets that generate future growth.

Tool-Rooms' measurement system strongly affects the behaviour of people both inside and outside the Tool-Rooms. If Tool-Rooms are to survive and contribute significantly towards growth of the manufacturing sector, especially MSMEs, they must use measurement and management systems derived from their strategies and capabilities.

We propose a holistic approach for capturing both financial and non-financial measures. The financial measures for growth, efficiency, profitability, etc are essential and more established monitoring indicators used historically. However, the non financial measures like investments in new opportunities, development of human resource, employer participation, etc are equally important. While the financial indicators reflect short-term performance, long-term sustainability is captured by non-financial measures. We propose that the **MIS tool should incorporate the following aspects for long term sustainability:**

- Financial Perspective – Growth, Profitability, Efficiency, Cash Generation, etc
- Outreach – Participation, Retention, Market Share, Value Creation

- Internal Processes Efficiency – Quality Assurance, Effective training, Outreach, Partnerships, Standardisation, etc
- Capability Enhancement – Innovation, Human Resource, Investments in new opportunities



Alignment of Strategy of Each Tool-Room to the Overall Vision

It is essential that the strategy of each Tool-Room is aligned to the vision of the Tool-Room programme of DC-MSME which would reflect common goals. For this purpose the MIS framework for each Tool-Room will be driven from the overall vision. It will be an integral part of the governance system at all levels of the organisation. The Tool-Room Management must understand the financial consequences of their decisions and actions; DC-MSME office and Governing Council must understand the drivers of impact and long-term financial efficiency. The objectives and measures of the MIS tool are more than just a somewhat ad hoc collection of financial and non-financial performance measures; they are derived from a top down process driven by the mission and strategy of the Tool-Rooms. The MIS tool should translate a Tool-Room's mission and strategy into tangible objectives and measures. The measures represent a balance between external measures for outreach and internal measures of critical business processes, innovation and learning and growth. The measures are balanced between the outcome measures – the result from past efforts – and the measures that drive future performance. And the MIS tool is balanced between objective, easily quantified outcome measures and subjective, somewhat judgemental, performance drivers of the outcome measures.



While the strategies, systems and processes change as per business needs, the vision remains constant

Assuming that the vision of the Tool-Room programme is to impact 25 per cent of the tooling market by the year 2020, the strategy to achieve the vision will be:

- Build private sector capacities in tooling and skill development to increase outreach
- Assist upgradation of private Tool-Rooms
- Develop market led skill development courses and network with private/ public players to increase outreach
- Design and disseminate processes to increase efficiency of private sector players
- Introduce innovative technologies and programmes

Aspects of the MIS tool

Design of the MIS tool is about identification of a small number of financial and non-financial measures and attaching targets to them so that when they are reviewed it is possible to determine whether current performance 'meets expectations'.

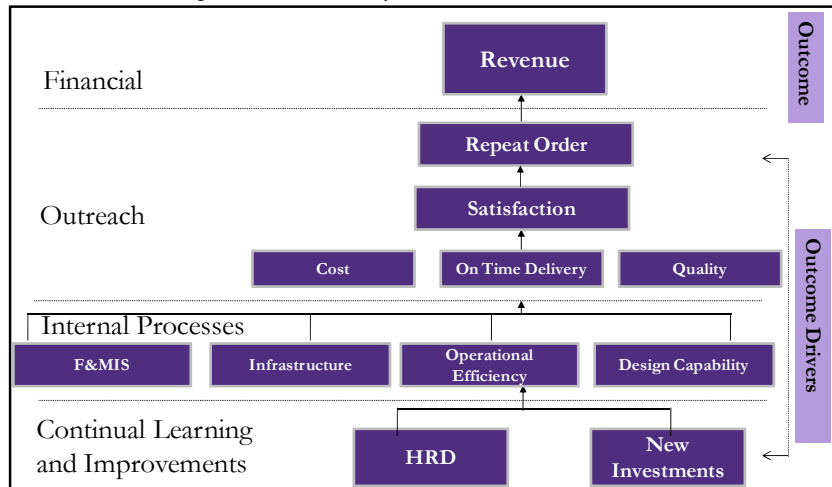
There are four steps to the MIS Tool design process:

- Translating the vision into operational goals
- Communicating the vision and linking it to individual performance
- Business planning; index setting
- Feedback and learning, and adjusting the strategy accordingly

Cause and Effect Relationships

A strategy is a set of hypotheses about cause and effect. The measurement system should make the relationships (hypotheses) among the objectives (and measures) in the various perspectives explicit so that they can be managed and validated. The chain of cause and effect should pervade all four perspectives of a MIS tool. For example: Revenue may be a MIS tool measure in the financial

perspective. The driver of this measure could be repeated and expanded orders from existing customers, the result of a high degree of satisfaction among those customers, the satisfaction is included in the MIS tool (in the outreach perspective)



because it is expected to have a strong influence on revenue. Analysis of customer preference may reveal that cost, on-time delivery of orders and quality are highly valued by customers. Thus, improved cost, on-time delivery of orders and quality are expected to lead to higher customer satisfaction, which, in turn is expected to lead to higher financial performance, and are incorporated into the outreach perspective of the tool.

The process combines by asking what internal processes the Tool-Room must excel at to achieve outreach, exceptional cost, on-time delivery and quality. To achieve improved cost, on-time delivery, and quality, the Tool-Room may need to achieve short cycle times in operating processes, excellent infrastructure and high-quality internal processes, factors that could be MIS measures in the internal perspective. Training and improving the skills of their operating employees, would be an objective for the learning and growth perspective. Thus, a properly constructed MIS tool will identify and make explicit the sequence of hypotheses about the cause and effect relationships between outcome measures and the performance drivers of those outcomes.

Vision elements				
Perspectives	Skill Development	Market Development	Innovation and new technology introduction	TDM Production
Financial 	• Increase revenues • Increase profitability • Become financially sustainable • Increase profitability of trainings			• Financial sustainability
Outreach 	• Increase number of students in long term • Increase focus on skill development for weaker sections of society • Enhance placements from long term courses and medium term courses • Ensure long term employability of students	• Increase in outreach		• Increase the reach of assistance to MSMEs
Internal Process Efficiency 	• Increase course relevance through proper demand estimation and industry involvement • Ensure practical skills development	• Asset utilisation of intermediaries	• Increase awareness of new technologies	• Decrease rejection • Enhance on time delivery • Increase quality of production • Asset utilisation for production
Capability Enhancement 	• Internal capability development • Ensure adequate staffing • Strengthen Performance Management • Commensurately reward employees			

Perspectives

Financial Perspective:

The MIS tool retains the financial perspective since financial measures are valuable in summarising the readily measurable economic consequences of actions already taken. Financial performance measures indicate whether the Tool-Room's strategy, implementation and execution are efficient.

Weight age: 40%

Perspective	#	Strategic Objective	Definition	Measure
FINANCIAL	F1	Increase revenues from production	To measure the total income generated by the Tool-Room from production	Revenues from Production/Increase over last year
	F2	Increase profitability	The efficiency of the Tool-Room at generating earnings	Profit Margin
	F3	Increase revenues from training	The amount of money generated from training	Revenues from Training/Increase over last year
	F4	Become financially sustainable	Tool-Room being able to manage likely developments and unexpected financial shocks in future periods without having at some stage to introduce substantial and economically destabilising expenditure or revenue adjustments	% Increase in Net worth excluding govt. grants
	F5	Enhance focus on production services for MSMEs	To measure the production revenue from MSMEs	% Production revenues from MSMEs

Outreach

On the outreach perspective, the focus would be on the trainees, employers and TDM customers. It would measure the outreach and effectiveness of servicing these three targeted beneficiaries. The core outcome measures include outreach – number of beneficiaries targeted directly or through intermediaries, customer/ employer (LSUs/MSMEs hiring trainees) satisfaction, customer profitability, trainee retention, and market and account share in targeted segments. The outreach perspective also includes specific measures of the value propositions that the Tool-Room will deliver to customers in targeted segments.

Weightage: 35%

Perspective	#	Strategic Objective	Definition	Measure
OUTREACH	C1	Enhance focus on trainings	Focus on skill development and value addition for the existing skilled labour	Total number of people trained
	C2	Increase number of students in long term and medium term course	Focus on skilled development and adequate infusion of skilled labour.	No. of people trained in long term courses and medium term courses
	C3	Increase focus on skill development for weaker sections of society	Encouragement to the weaker sections of the society	Percentage of students in long terms courses from weaker sections
	C4	Increase the reach of assistance to MSMEs	For supporting as many MSMEs as possible.	- No. of Consulting/ Advisory services provided to MSMEs - No. of MSMEs served
	C5	Linkages with private sector tool room/ training institutions	Hub and spoke	No. of private sector tool rooms/training institutions

Internal Process

On the internal process perspective, the measures relate to the critical internal processes in which the Tool-Room must excel. The measures focus on the internal processes that will have the greatest impact on outreach, customer/ employer/ trainee satisfaction and achieving the Tool-Rooms' financial objectives.

Weightage: 15%

Perspective	#	Strategic Objective	Definition	Measure
PROCESS	P1	Increase course relevance through proper demand estimation and industry involvement	Placement of students in long term and medium term courses	• % of students placed for long term courses • % of students placed for medium term courses
	P2	Decrease rejection	To avoid wastage of resources	• Percentage rejection and rework
	P3	Enhance on time delivery	To improve customer satisfaction and increase number of customers	• Percentage on time delivery
	P4	Asset utilisation for production	For judicious use of the assets	• Asset utilisation of category A machines • Asset utilisation of category B machines
	P5	Enhance fund utilisation	For better utilisation of the funds provided by MoMSME	• % of sanctioned budget utilised

Capability Enhancement

The fourth perspective of the MIS tool, Capability Enhancement identifies the knowledge and infrastructure that the organisation must build to create long term growth and impact. The outreach and internal business process perspectives identify the factors most critical for current and future successes. Tool-Rooms are unlikely to be able to have their long term impact using today's technologies and capabilities. Organisational learning and growth come from three principal sources: people, systems and organisational procedures. The financial, outreach and internal business process objectives on the MIS tool reveal large gaps between the existing capabilities of people, systems and procedures and what will be required to achieve breakthrough performance. To close these gaps, Tool-Rooms will have to invest in reskilling employees, enhancing information technology and systems, aligning Tool-Rooms' procedures and routines, and innovate and acquire new technologies.

Weightage 10%

Perspective	#	Strategic Objective	Definition	Measure
CAPABILITY ENHANCEMENT	I1	Internal capability development	For capacity building of trainers/employees and for improved performance of employees	- No. of trainings conducted for trainers - Availability of MIS - Design of performance linked rewards
	I2	Ensure adequate staffing		Development of annual training /exposure /knowledge enhancement Plan for employee

A detailed write up on the subject with software for performance measurement has been provided separately to GIZ. A consolidated matrix of measures and weights is given as Annexure 4

PART III: Recommendations for individual Tool-Rooms

To meet the country's needs for skilled manpower and innovation of technologies needed by the industry in future, highlighted above, the recommendations are made below, for individual Tool-Rooms on the following basis and summarized at the end.

- Training values should not only be upheld, but elevated further. For practice therefore not more than 2 trainees should be deputed on one machine.
- For Tool and Die making course the present guiding ratio of practice to theory period of 70:30 should be maintained.
- In addition to long term courses, Tool-Rooms shall also conduct short-term courses, as is being presently done.
- New technologies should be developed at one Tool-Room and then, on successful installation there, should be adopted by others.

Recommendations

Central Tool Room, Ludhiana

- **Increase training capacity for Long-Term Courses:** Augmentation of capacity for the diploma course and other long term courses by 1400, of which 400 should be in Tool & Die Making and 1000 in other long term courses. Out of this, 50% capacity is to be expanded in-house at Ludhiana or its own sub-centers and balance 50% by leveraging industry infrastructure. In house expansion would require capital investment of 24.65 crores including preoperative expenses and additional working capital. Proposed infrastructure is given in Annexure I. This activity will be self supporting on recurring account. A suitable revenue sharing mechanism with industry for their participation to be designed.
- **Set up new technologies:** Interaction with stake holders projected demand for creation of facilities to grind tungsten carbide tools, involving complex profiles which need 5-axis Tool & Cutter Grinder suitable for carbide tools. CTR introduced the technology of salt bath furnaces for heat treatment in the region which the industry has now adopted in their own facilities. This technology however is health hazardous. Cleaner and more effective technology of vacuum heat treatment is now available and called for at CTR. It is used well in Bhubaneswar; demand in Ludhiana is only more.

The two proposals need an investment of R.3.5 crores, other physical infrastructure is available. Tool-Rooms at Aurangabad, Indore and Jamshedpur can consider it at a later stage as they have similar concentration of industries.

- **Fill up important functional vacancies:** Important functions like production and marketing are not manned at appropriate levels. Also some employees are at the same levels for long periods. A review should be carried out and career needs suitably addressed.

Central Tool Room and Training Centre, Bhubaneswar

- **Increase training capacity for Long-Term Courses:** Augmentation of capacity for the diploma course other long term courses by 2060 per annum over a period of 5 years. Out of this 560 should be in Tool and Die Making and 1500 in other long-term courses. Total capital investment including pre-operative expenses estimated for scaling up is Rs.69.02 crores in CITTC Bhubaneswar or its sub-centers, including preoperative expenses and additional working capital. This activity will be self supporting on recurring account. Proposed infrastructure is given in Annexure I.

Industry in and around CTTC is not yet developed to a level to that it will invest in training infrastructure in collaboration with CTTC Bhubaneswar. But country needs it and CTTC Bhubaneswar's management is competent to handle the task well.

- **Facilities for Plasma Nitriding:** CTTC is rendering state of the art vacuum heat treatment service to the industry. Apart from producing quality parts it in environment friendly. No toxins are generated. There is need to add plasma nitriding to its range of services in this area. Department of Science and Technology encourages its use in comparison to toxic cyaniding process. They might even give funds. An investment of Rs.1 crore is involved. Tool-Room at Ahmedabad is already operating this technology. In future it could be considered by all others, except Guwahati where there may not be a justifiable demand in next 5 years.

Tool Room and Training Centre, Guwahati

- **Start Diploma Course:** TRTC is not presently offering diploma course in tool and die making. There is no production activity, except what trainees do as part of their practice limited to machining but no tool parts. It should add Diploma in Tool & Die Making and other long-term courses. Level recommended is 120 tool and die makers and 300 other long-term courses in related trades to be achieved in next 5 years. It should also make a start to design and manufacture tools and tool parts. A capital investment of 15 crores is needed for creation of infrastructure, including preoperative expenses and additional working capital. This activity will be self supporting on recurring account. Proposed infrastructure is given in Annexure II. This will also enable TRTC to expand need based short-term training courses.

Central Institute of Tool Design, Hyderabad

- **Increase training capacity for Long-Term Courses:** There is a great demand for trained tool makers in the country; CITD has an excellent reputation in this field. Local demand is also significant. Likewise other long term courses run are also in Demand. Augmentation of capacity for the diploma course and other long term courses is needed to meet the demand. Additional intake of 480 tool makers and 1200 other trades is proposed. It will also augment the output of short-term trainees. Of this capacity, 50% should be created in CITD Hyderabad or by opening sub-centers over a period of 5 years, which calls for an investment of Rs.29.58 crores including preoperative expenses and additional working capital. Proposed infrastructure is given in Annexure I. This activity will be self supporting on recurring account. For remaining 50% infrastructure available with the industry or to be created by it, on revenue sharing basis, should be used. Revenue sharing model could be worked out.
- **Set up Micromachining Facility:** CITD is in the midst of precision industry and scientific and research organizations and has interaction with universities. This is the emerging technology, catching up fast. Tool-Rooms family should establish this to assist MSMEs requiring it. CITD can develop it as it is already using the most precise equipment available in Tool-Rooms and possesses the needed synergy. It will involve a capital investment of around 2 Crores. It could also be needed at Indore, Ahmedabad and Kolkata in future.

Indo-German Tool Room, Indore

- **Increased training capacity for Long-Term Courses:** An auto-component cluster is nearby at Pithampur. The cluster needs and has huge demand for Tool-Makers and other trained technicians. Country's requirement projected by TAGMA is 85000 to 90000 additional skilled persons, every year, for next 3 to 4 years. Augmentation of capacity by IGTR Indore for the

diploma course by 480 and other long term courses by 1200 is recommended to meet the demand for such skilled manpower in the country. Of this, 50% increase should be by IGTR, at Indore or by opening sub-centers in the region; this will need capital investment of around Rs.29.58 crores, including preoperative expenses and additional working capital. Proposed infrastructure is given in Annexure I. This activity will be self supporting on recurring account. For the balance 50% infrastructure of the industry should be put to use on revenue sharing basis.

- **Setup New Technologies:** Use of new technologies of water jet machining and laser machining is growing especially in the auto - component industry of which there is a cluster at nearby Pithampur. Need was also expressed by stake holder at IGTR Indore. It is recommended that this Tool-Room should introduce and promote these technologies. An investment of 2.5 crores is envisaged. There is concentration of auto-component industry near Tool-Rooms at Aurangabad and Ahmedabad who would be potential users of these technologies in future.

Central Institute of Hand Tools, Jalandhar

- **Increase training capacity for Long-Term Courses:** CIHT has started its training course leading to Diploma in Tool and Die Making. Jalandhar and nearby areas have huge concentration of industry needing skilled manpower. Over the next 5 years, it should augment capacity for the diploma course by 160 and other related long term courses by 400. Of this 50% should be in house at Jalandhar or by opening sub-centers which envisages an investment of Rs.9.86 crores, including preoperative expenses and additional working capital. Proposed infrastructure is given in Annexure I. This activity will be self supporting on recurring account. Balance 50% capacity should be created by CIHT by providing its faculty and other software and leveraging infrastructure of the industry on profit sharing basis.
- **Develop Expertise in design and manufacture of dies and moulds:** CIHT was set up for hand tools. Based on demand for tool makers more equipment was given to CIHT but employees were not trained in design and manufacture of moulds and press tools. They cannot therefore hand these tools although there is equipment. There is huge demand from the local sports industry. Expert assistance is needed for 24 m/m in design and manufacture and production planning and control. Also, they should be supported in training their employees in other Tool-Rooms, before the experts arrive so that technology transfer takes place.

Indo-Danish Tool Room, Jamshedpur

- **Increase training capacity for Long-Term Courses:** Jamshedpur is large auto-component industry cluster needing Tool Makers and other similarly skilled personnel. The cluster has huge demand for these. Augmentation of region's capacity for the diploma course by 480 and other related long term courses by 1300 will go in a long way to meet the demand for such skilled manpower in Jamshedpur, areas around and the rest of the country. For half of this IDTR should leverage the infrastructure in the industry or to be created by them so that IDTR provides faculty and other software on revenue sharing basis. Remaining 50% should be developed in-house at Jamshedpur or sub-centers. Estimated investment for this in-house scaling up is Rs.29.58 crores, including preoperative expenses and additional working capital. Proposed infrastructure is given in Annexure I. This activity will be self supporting on recurring account.

Central Tool Room and Training Centre, Kolkata

- **Increase training capacity for Long-Term Courses:** West Bengal has a large concentration of industry that has huge demand for these trained skill people, like tool makers and other similarly trained personnel. Augmentation of capacity for the diploma course by 400 and other long term courses by 900 is needed. CTTC should meet 50% of this which will call for an investment of Rs.24.68 crores, including preoperative expenses and additional working capital. Proposed infrastructure is given in Annexure I. This activity will be self supporting on recurring account. Balance 50% should be done by CTTC by leveraging industry on revenue sharing basis.
- **Rejuvenate Infrastructure:** Seven of their critical machines are under breakdown, some for five years. Other machines are also not in good condition. Buildings need repairs; periodical services have not been carried out for 10 years. CTTC should rejuvenate the infrastructure. CTTC, on its own, has not been able to arrest the declining trend of working condition of infrastructure. It is recommended that a professional firm or individual consultant be retained for this purpose. Machines within economic repairs should be repaired and those beyond it be replaced. From the condition observed, first estimates of this activity are Rs.6 crores which can be refined only after a detailed examination.

Indo-German Tool Room, Ahmedabad

- **Increase training capacity for Long-Term Courses:** Gujarat is now becoming the hub of automobile and auto-component industry. The cluster needs and has huge demand for Tool-Makers. Likewise other long term courses run are also in Demand. To meet regional demand and national needs, training capacity at IGTR Ahmedabad should be augmented by 480 for the main diploma and 1200 for other long term courses. It is proposed that 50% of this should be done in-house at Ahmedabad or by opening sub-centers in nearby industrial towns for which an investment of 29.58 crores would be needed, including preoperative expenses and additional working capital. Proposed infrastructure is given in Annexure I. This activity will be self supporting on recurring account. Balance 50% capacity should be created by leveraging avenues available with the Industry or by creating the same under various schemes.
- **Develop expertise for high end moulds:** Although some attempts have been made here and there, the Tool-Room family is still to develop expertise in design and manufacture moulds like transfer moulds and hot runner moulds which will be more in demand in the coming times to improve quality and productivity of industrial components. Tool-Rooms under DC MSME should develop this expertise. IGTR is recommended to do the same and then share with others. They need machines for trials, software and some mould components like heat tubes etc for carrying out the development. Budget: Rs. 2.5 crores. Other Tool-Rooms can share the expertise later.

Indo-German Tool Room, Aurangabad

- **Increase training capacity for Long-Term Courses:** As recommended for other Tool-Rooms IGTR Aurangabad should also contribute in meeting the national demand for skilled workforce trained in tool making and other mechanical engineering. It should be instrumental in augmenting the capacity by 1120 trained persons of which 320 should be tool makers. Fifty percent of the capacity of 1120 should be created in-house at Aurangabad or other places by opening sub-centers which calls for an investment of Rs.19.72 crores, including preoperative expenses and additional working capital. Proposed infrastructure is given in Annexure I. This activity will be self supporting on recurring account. For balance 50% IGTR should leverage industry infrastructure on revenue sharing basis.

- **Develop Fine Blanking Technology:** With auto-component industry projected to grow @ 21 % per annum the coming years, need for precision, faster deliveries and reduced costs will go up. Fine blanking meets these requirements, especially for sheet metal auto-components. IGTR Aurangabad is recommended to develop this technology and then share it with other tool rooms. Inputs needed are fine blanking press, software and working materials. Budget: Rs.2.5 crores. Tool-Rooms at Ahmedabad and Jamshedpur could be next potential users.

Summary of above proposals for individual Tool-Rooms

S. No.	Tool-Room at	Increase in training output on a/c of proposals		Proposed Investments in INR in Crores	
		TDM Course	Other LT Courses	Scaling up training	Technology Innovation
1	Ludhiana	400	1000	24.65	3.50
2	Bhubaneswar	560	1500	69.02	1.00
3	Guwahati	120	300	15	
4	Hyderabad	480	1200	29.58	2.00
5	Indore	480	1200	29.58	2.50
6	Jalandhar	160	400	9.86	*
7	Jamshedpur	480	1300	29.58	
8	Kolkata	400	900	24.68	6.00
9	Ahmedabad	480	1200	29.58	2.50
10	Aurangabad	320	800	19.72	2.50
Total		3880	9800	281.25	20.00
		13680		301.25	

Ratio of long-term and short-term courses at Tool-Rooms average to 1:4. As a result of these proposals, Tool-Rooms shall also conduct short-term courses for up to 50000 trainees depending upon the needs and duration of courses. * 24 man months of experts services proposed. Jamshedpur has drawn plans for next 5 years which are endorsed. Equipment proposed for Guwahati for training in tool and die making and start production of tools shall take care of technology innovation there.

Annexure 1

Module suggested for Infrastructure for 80 Tool & Die Makers. Number of modules can be selected by Tool Rooms based on the scaling up of Tool and Die Making course. Infrastructure will accommodate other Long Term courses. This will also scale up short term courses in the present proportions at the Tool-Rooms			
MACHINES / EQUIPMENT			
Sl. No.	Description	Quantity	Estimated Cost
			Rs. In lacs
1	Lathes	12	60
2	Milling Machines	12	96
3	Surface Grinders	4	35
4	Cylindrical Grinders	4	35
5	Tool & Cutter Grinders	4	45
6	Radial Drill	1	10
7	Pillar Drills	3	3
8	Pedestal Drills	5	2
9	Power Saws	2	7
10	CNC Lathes	2	30
11	CNC Milling Machines	2	50
12	Vertical Machining Centre	1	40
13	CNC Table Top Trainer Lathes	2	30
14	CNC Table Top Trainer Milling Machines	2	37
15	CNC Wire Cut Machine	1	35
16	EDM Machine	1	15
17	Computers, related hardware and soft ware, VLIS, networking (50 workstations)	set	85
18	Injection Moulding Machine	1	25
19	Hand injection moulding machines	2	1
20	Hydraulic Press	1	20
21	Metrology, inspection equipment	set	45
22	Voltage Stablisers, UITs, UPS	set	15
23	Furniture and Fixtures	25	20
	Sub-Total		741
B	Building, 1800 square meters		200
C	Pre-operative expenses and working Capital		45

	Total capital investment		986
D	Salaries		15 lacs per annum
E	Running Expenses		60 lacs per annum
F	Estimated realisable fees		250 per annum

Annexure 2

Infrastructure proposed for Tool-Room and Training Centre, Guwahati			
MACHINES /EQUIPMENT			
Sl. No.	Description	Quantity	Estimated Cost, INR in lacs
1	Lathes	18	90
2	Milling Machines	18	144
3	Surface Grinders	7	65
4	Cylindrical Grinders	7	65
5	Tool & Cutter Grinders	7	80
6	Radial Drill	1	10
7	Pillar Drills	3	3
8	Pedestal Drills	5	2
9	Power Saws	2	7
10	CNC Lathes	4	60
11	CNC Milling Machines	4	100
12	Vertical Machining Centre	2	80
13	CNC Table Top Trainer Lathes	3	45
14	CNC Table Top Trainer Milling Machines	3	55
15	CNC Wire Cut Machine	2	75
16	EDM Machine	1	15
17	CNC EDM	1	25
18	Computers, hardware and soft ware, VLIS, networking (55 workstations)	set	110
19	Injection Moulding Machine	1	25
20	Hand injection moulding machines	4	2
21	Hydraulic Press	1	20
22	Metrology, inspection equipment	set	55
23	Voltage Stabilizers, UITs, UPS	set	20
24	Furniture and Fixtures	25	30
	Sub-Total		1183
B	Building, 2000 square meters		250
C	Pre-operative expenses and working Capital		60

	Total capital investment		1493
	(say Rs.15 crores)		
D	Increase in salaries		45 lacs per annum
E	Additional other running expenses		125 lacs per annum
F	Estimated realizable fees		375 lacs per annum
G	Estimated production		125 lacs per annum

Annexure 3: List of Suggested Long-Term Training Courses

S. No.	Name of the Course	Duration
1	Diploma in Tool & Die Making	4 years
2	Post Graduate in Tool Engineering and CAD/CAM	1 year
3	M.E(Mech-CAD/CAM), needs collaboration with a University	2 years
4	M.E(Tool Design) , needs collaboration with a University	2 years
5	M.E(Mechatronics) , needs collaboration with a University	2 years
6	Post Graduate Course in CAD/CAM in Tool Engineering	1.5 years
7	Post Graduate Diploma in Mechatronics	1.5 year
8	Post Graduate Diploma in Mould and Die Design	1.5 years
9	Post Diploma in Tool Design & Manufacturing	1 year
10	Post Diploma in Computer Aided Design and Manufacturing	1 year
11	Advanced CNC Machining Course	1 year
12	Certificate ITI Machinist Course	2 years
13	Certificate ITI Fitter Course	2 years
14	Certificate Course in CNC Technology	2 years
15	Condensed Certificate Course in Tool & Die Making	1 year
16	Certificate Course in Basic Machining	1 year
17	Certificate Course in CNC Machinist	1 year
18	Certificate Course in Machine Operation	1 year
19	Post Diploma in CAD/CAM	1 year
20	Certificate Course in CNC Turning & CNC Milling	1 year
21	Certificate Course in Advance Machining	1 year
22	Certificate Course in Advance Machine Maintenance	1 year
23	Certificate Course in CNC Machining	1 year
24	Certificate Course in CNC Programming & Practice	1 year
25	Certificate Course in Computer Aided Engineering	1 year
26	Post Diploma Certificate in CNC Machine Maintenance	1 year
27	Post Graduate Diploma Design	1 year

Annexure 4: Weights and measures of the MIS tool

Area	Key Result Area	Key Performance Indicator	Weight (%) Proposed	Remarks for the targets	Means of Measurement
Financial	Increase revenues from training	Revenues from Training	7.50%	Measured against target set by MoMSME	Absolute numbers
	Increase revenues from production	Revenues from Production	7.50%	Measured against target set by MoMSME	Absolute numbers
	Profitability	Net Profit Ratio	15.00%	Measured against target set by MoMSME	In percentage
	Enhance Wealth creation	% Increase in Net worth excluding govt. grants	5.00%	Target set at 20% increment from last year	In percentage
	Enhance focus on services for MSMEs	% production revenues from MSMEs	5.00%	Minimum production revenues - 50%	In percentage
Outreach	Increase focus on training	Total number of people trained	7.50%	Measured against targets fixed in the action plan report	Absolute numbers

Area	Key Result Area	Key Performance Indicator	Weight (%) Proposed	Remarks for the targets	Means of Measurement
	Increase training focus - on long term/medium term courses	No. of people trained in long term courses and medium term courses	8.00%	Measured against targets fixed in the action plan report. Medium term courses duration is more than 6 years and less than one year	Absolute numbers
	Linkages with private sector tool room/ training institutions	No. of private sector tool rooms/training institutions	4.00%	Not used in the pilot tool. To be used in the future	Absolute numbers
	Increase the reach of assistance to MSMEs	No. of Consulting/ Advisory services provided to MSMEs	3.00%	Not used in the pilot tool. To be used in the future	Absolute numbers
		No. of MSMEs served (for tooling , design , job works, testing)	7.50%	Measured against targets fixed in the action plan report submitted to MoMSME.	Absolute numbers
	Increase focus on skill development for weaker sections of society	% students from weaker sections	5.00%	To be measured against the target set by DC MSME	In percentage
Process	Reduce rejection	% rejection	2.00%	Less than 5% rejection is 100% rating.	In percentage
	Enhance on-time delivery	% on time delivery	2.00%	Not used in the pilot tool. To be used in the future	In percentage
	Increase course relevance through proper demand estimation and industry involvement	% of students placed for long term courses	3.00%	90% target for courses with a duration of one year and more	In percentage
		% of students placed for medium term	2.00%	60% target for courses with a duration of 6 months to 1 year	In percentage
	Enhance Fund utilization	% of sanctioned budget utilized	2.00%	Measured against targets for last year. Not used in	In percentage

Area	Key Result Area	Key Performance Indicator	Weight (%) Proposed	Remarks for the targets	Means of Measurement
				the pilot tool. To be used in the future	
	Drive Asset Utilization	Asset Utilization for Category A machines	2.00%	85% target for machines with a capital cost of Rs.50 lakhs and above	In percentage
		Asset Utilization for Category B machines	2.00%	75% target for machines with a capital cost of Rs. 50 lakhs and less	In percentage
Capability Enhancement	Internal Capability Development	No. of trainings for skill enhancement conducted for staff(ideal metric would be average training hours per employee)	2.50%	Measured against targets given by DC MSME	Absolute numbers
		Availability of MIS	2.50%	If MIS is available then 100% rating else 0%	Yes/No
		Implementation of performance linked rewards	2.50%	If incentive system is in place then 100% rating else 0%	Yes/No
	Ensure adequate staffing	Development of annual training /exposure /knowledge enhancement Plan for employee	2.50%	If yes then 100%, else 0% rating	Yes/No

DRAFT



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Strategic Assessment of MSME Tool Rooms

As Is Assessment Report – IGTR Ahmedabad

Prepared for

**Micro, Small and Medium Enterprises
Umbrella Programme**



Knowledge Partner:



Grant Thornton

Contents

	Page
Contents	2
Abbreviations Used	5
Executive Summary	7
Introduction	9
Chapter I Organisational Profile	11
Chapter II Governance and Management Systems	13
Chapter III Organisational Assessment	17
Chapter IV Overview of Local Business Environment from Tool-Room Perspective	31
Chapter V Inclusive Growth underlined by Social Impact	33
SWOT	35
Conclusion	36
Annexure I Details of Visits	37
Annexure II Training Courses	38
Annexure III Equipment	42

Table 1: IGTR Profile.....	11
Table 2: Annual Targets and Performance.....	14
Table 3: Service Mix.....	17
Table 4: Clusters Served	18
Table 5: Revenue Contribution	18
Table 6: Spread of products, values.....	22
Table 7: Industry Break up of IGTR Ahmedabad.....	23
Table 8: Building Areas in square metres	24
Table 9: Personnel.....	26
Table 10: Retention Pattern	27
Table 11: Machine Utilisation.....	28
Table 12: Net Worth with Government Grants.....	28
Table 13: Government Grants	28
Table 14: Net Worth without Government Grants.....	29
Table 15: Trend Analysis.....	30
Table 16: Backward Linkages	31
Figure 1: Percentage share of revenue.....	18
Figure 2: Number of persons admitted in long-and short-term courses.....	19
Figure 3: Sources of Trainees Fees	20
Figure 4: Share of fees from long-term and short-term courses in 2010-11.....	20
Figure 5: Training income trends between long- and short-term courses	20
Figure 6: Spread of Production Services.....	23
Figure 7: Repeat Customers.....	23
Figure 8: Geographic Spread of Production Services.....	24
Figure 9: Profitability and Composition	29
Figure 10: Trend Analysis.....	30
Figure 11: Social spread of trainees	33
Figure 12: Gender Spread	34

Abbreviations Used

AICTE	All India Council of Technical Education
CAGR	Compound Annual Growth Rate
CTTC	Central Tool Room and Training Centre
CAD	Computer Aided Design
CNC	Computer Numerical Control
CAM	Computer Aided Manufacturing
D	Dimensional
DC	Development Commissioner
DG	Diesel Generating
EDM	Electric Discharge Machining
ESPD	Entrepreneurship & Skill Development Programme
FMIS	Financial & Management Information System
FY	Financial Year
GFR	General Financial Regulations
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GOI	Government of India
HOD	Head of Department
HRD	Human Resource Development
HT	Heat Treatment
ISO	International Standards Organisation
IT	Information Technology
ITI	Industrial Training Institute
IMTEX	India Metal-cutting Machine Tool Exhibition
IITF	India International Trade Fair
L 1	First Lowest
LAN	Local Area Network
M/c	Machine
MIS	Management Information System
MoMSME	Ministry of Micro, Small and Medium Enterprises
MSME	Micro, Small and Medium Enterprises
NTTF	Nettur Technical Training Foundation
OEM	Original Equipment Manufacturers
PG	Post Graduate
RP	Rapid Prototyping
SOP	Standard Operating Procedure

Executive Summary

MSME Indo-German Tool-Room at Ahmedabad is one of the four set up under Indo-German Technical Co-operation Tool-Room Programme for the design and manufacture of tools and training of manpower in employable skills in tool making and allied trades. The Tool-Room has been operational as Government of India Society under the Chairmanship of DC MSME since 1990. The total investment in the project during the collaboration period was Rs.53.32 crore, which included contributions from the Government of India, Government of Germany and the State of Gujarat, accounting for Rs.12.21 crore, Rs.28 crore and Rs.13.11 crore, respectively.

IGTR is equipped with state-of-the-art tool-room equipment, which includes high-end tool machines like jig boring and jig grinding CNC machining centres, CMMs, rapid prototyping system and heat treatment equipment, including plasma nitriding equipment.

IGTR's performance has seen significant improvement with the joining of the present General Manager who has driven the motivation among officers and the staff of the Tool-Room. The Tool-Room is able to recover its costs after deducting depreciation. Its revenue and expenditure stood at Rs.689.22 lakhs and Rs.675.34 lakhs, thus generating a surplus of Rs. 13.88 lakhs in 2010-11. This surplus amounts to Rs.133.62 lakhs on accrual basis as many dues could not materialise during the year. Furthermore, training at IGTR has also substantially improved and contributes 74% to its revenue with 12% employees. The share of MSMEs in production-related services accounted for more than 90% in 2010-11, however, it tends to be less in absolute terms as the total contribution from production services stood only at 22.21% of its revenue. In 2010-11, IGTR trained 3543 persons in its training programmes.

IGTR has manpower of 85. An incentive scheme is in position to motivate employees towards better performance. About 3 months' salary is likely to be paid as incentive for performance during 2010-11 (subject to ceiling for employees with higher basic salary). Additionally, good HR policy is in place. Effective communication is maintained among employees at all levels. A systematic approach to depute employees for skill and management development programmes is also followed.

IGTR's objectives are to assist MSMEs of the western region to enhance their competitiveness by providing high-quality tools, common facilities in machining and heat treatment, consultancy to increase the quality and productivity of their products, training young men for the industry and to sharpen skills of existing employees from the industry. Unlike fixed targets for achieving cost recovery, no targets are set to provide assistance to MSMEs in terms of value, outreach or impact. It must be noted that the focus has therefore shifted towards training.

IGTR being a Government of India Society has to work under its guidelines. However, there are areas in which the autonomy built into the system has not been appropriately utilised. Some members of the Governing Council have been unaware of being part of decision making. Also, their involvement in the design of industry-oriented training programmes and efficient procedures and processes at IGTR has not been significant.

Some of the key challenges, constraints and solutions are enumerated below:

<u>Function</u>	<u>Challenge/ constraints</u>	<u>Key solutions /ideas</u>
Policy goals and direction	Outlined Policy goal for the setting up of IGTR is to enhance the competitiveness of MSMEs through supply of tooling services and skilled manpower. However, monitoring of performance is mainly on financial parameters and not so much on outreach and impact.	A balanced approach needs to be synthesised aimed at achieving efficacy of production functions and providing assistance to MSMEs while aiming for self-sufficiency.
Autonomy of the Institution	IGTR is set up as an autonomous society, however, is guided by Government policies to a large extent. The Governing Council, the decision making body, meets once in a year on an average.	Setting up one apex body under DC MSME to administer all Tool-Rooms would be examined while consolidating management issues for all 10 Tool-Rooms.
Management Systems	Utilisation of machines is not currently analysed. How the total number of hours available on high value machines is spent needs to be analysed. Data on cost estimates and actual costs is not analysed. Post placement tracking of trainees is not undertaken	Design of IT enabled Financial and Management Information System (FMIS) is required.
Procurement System	IGTR follows General Financial Rules (GFR) calling for quotations and decision making guided by L 1 principle due to which suppliers tend to quote lower rates, sometimes compromising on quality.	Rate contract system should be considered for raw materials. Development of a procurement manual would be beneficial.
Networking with other institutions and alumni	There is no networking with other Tool-Rooms/institutions except annual General Meetings. The Tool-Room does not leverage the network of its alumni to enhance its marketing.	Networking with Tool-Rooms, including Head of Department level, would be useful. IT enabled platform networking with alumni is essential.

Introduction

Background Information

Manufacturing excellence begins with Tool-Room. According to industrialists, Tool-Room is the backbone of the industrial infrastructure of a nation. Unless tooling develops, industry will not develop. Being capital intensive, MSME units cannot afford in-house tooling facilities. To assist them with common tooling facilities, the Government of India took the initiative and set up ten Tool-Rooms for design and manufacture of tools and for training of manpower in tool-making and allied trades. Of these, four have been set up with the assistance of the Government of Germany, three by the Government of Denmark, and two under UNDP and one without any external assistance. These Tool-Rooms are set up as the Government of India Societies with DC MSME as the Chairman. MSME Indo-German Tool-Room at Ahmedabad is one of the four Tool-Rooms set up with assistance from the Government of Germany. The Tool-Rooms are now operating for about 10 years after the closing of the agreements of external assistance. GIZ is supporting an evaluation study of 10 Tool-Rooms. M/s Grant Thornton Advisory Private Limited has been retained as Consultants to carry out the Study. Tool-Rooms under the State Governments are outside the scope of this study.

Terms of Reference

Tasks entrusted to the Consultants are 'As Is' reports of ten Tool-Rooms; recommendations for improving performance and action plan for the same.

The consultants have been tasked to analyse the existing strengths and weaknesses of ten Tool-Rooms in terms of their management, finances, human resources, technology and infrastructure, as part of the 'As Is' assessment that includes the following:

- a. institutional / organisational development study of the scheme consisting of political economy aspects involving actors, financial flows, management systems and inter-agency issues
- b. stakeholder feedback on existing Tool-Room services from MSMEs and relevant business associations
- c. stakeholder feedback on further requirements from Tool-Rooms by MSMEs and relevant business associations [a & b to be executed in form of a user feedback survey]
- d. training needs of Tool-Room personnel
- e. comparison of services with similar private sector and German facilities
- f. best practices from comparable national institutions such as the Nettur Technical Training Foundation (NTTF), Bengaluru, a private educational trust established with Swiss assistance

Methodology

Data has been collected from secondary information on MSME Tool-Rooms and through a structured questionnaire. Facilities of the Tool-Room were visited and series of meetings and

discussions took place with senior and middle management, local associations, suppliers, user MSMEs, large clients and state government agencies for assessment.¹

Functioning of the Tool-Rooms has been analysed and assessed. Recommendations are made for improving alignment of services to the strategic goals through optimum mix of different services, delivery approach, cost recovery and impact. Scope for improvement in procedures, governance, technology, human resource and networking are also indicated.

This report is, however, limited to 'AS IS' assessment and analysis of MSME Indo-German Tool-Room, Ahmadabad. Recommendations are part of a separate consolidated report for 10 Tool-Rooms.

Structure of the report

Given below is a summary of how the report has been structured:

Chapter I – Organisation Profile: A brief description of IGTR Ahmadabad.

Chapter II – Governance and Management Systems: This chapter assesses the autonomy of the Tool-Room, guidelines of the Ministry of MSME and the level of its interaction with DC MSME.

Chapter III – Organisational Assessment: This chapter assesses the current services, physical and technological infrastructure, marketing, finance, management systems, human resource and its impacts against the stated policy goals.

Chapter IV – Overview of local Business Environment: This chapter assesses the location of the Tool-Room and the market potential for it to expand its services. It also analyses the backward linkages with raw material and machinery suppliers.

Chapter V – Inclusive Growth underlined by Social Impact: This chapter analyses the impact made by IGTR in training, tooling and other services.

¹ Complete list of meetings and interviews is placed at Annexure I.

Chapter I

Organisational Profile

The Government of India established the MSME Indo-German Tool-Room (IGTR) in Ahmedabad with assistance from the Government of Germany who provided a part of equipment as well as services of experts in design and manufacture of tools during the project period. The State Government of Maharashtra provided land and financed building cost. Constitutionally, it is a registered Society administered by MoMSME, Government of India. Governing Council constituted by the Government has representatives from the Government of India, the State Government and the Industry. DC MSME is the Chairman of the Governing Council. Project profile is given in Table 1.

Table 1: IGTR Profile

1.	Project Background	Established under Indo-German Technical Co-operation Tool-Room Programme to assist MSMEs in tooling and training of manpower in tool design and manufacture and allied trades in Maharashtra and adjoining states. It started its operations in 1990. Co-operation programmes were upto 31 st March 2003.											
2.	External Agency	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH											
3.	Funding Pattern (INR in crore)	<table><tr><td>GoI</td><td>GoG</td><td>GoM</td><td>Total</td></tr><tr><td>12.21</td><td>28.00</td><td>13.11</td><td>53.32</td></tr></table>				GoI	GoG	GoM	Total	12.21	28.00	13.11	53.32
GoI	GoG	GoM	Total										
12.21	28.00	13.11	53.32										
4.	Organisational Structure	Government of India Society – An autonomous body under MoMSME, DC MSME											
5.	Objectives	To primarily assist small scale enterprises by: • providing consultancy for effective use of tools, jigs, fixtures & gauges and guidance regarding their procurement and/ or manufacturing • design and manufacture of tools, jigs, fixtures, moulds, dies and gauges based on in-house design or customers’ design • carrying machining jobs for tool parts for commercial Tool-Rooms and providing related services • assist in product development with rapid prototyping facility • common facility in heat treatment and plasma nitriding • conducting long-term training courses in tool and die making and allied trades • conducting short-term training courses for entrepreneurs and employees of MSMEs											

6.	Technology	Following technologies are available at IGTR: • Production facilities: CNC milling machines, CNC lathe, CNC wire cut machines, CNC EDM machines, jig boring machines, surface and cylindrical grinding machines. Range: Maximum weight 7000 kg and accuracy 5 microns • Plasma nitriding furnace • Rapid prototyping machine • Quality control equipment: CMM, accuracy ± 0.005 mm • CAD/CAM hardware & software, including simulation software • Heat treatment equipment, includes vacuum type • (CNC machines and CAM workstations on LAN/ WI_FI)
7.	Production Range	• Tools: Moulds for plastics, die casting dies, press tools, • Jigs, fixtures and gauges • Job work, heat treatment, nitriding
8.	Training Programmes	Long-term Courses (One year or more duration) – Diploma Course in Tool & Die Technology. Duration: 4 years. This course is approved by AICTE. – Certificate course in Machinist Tool Room. Duration: 3 years – Certificate course in Tool Technology. Duration: 2 years – PG Diploma in Tool Design & CAD/CAM.. Duration: 18 months – Ten certificate courses in various disciplines of tool engineering, CNC technology and IT. Duration: 1 year Short-term Courses (Less than one year) The short-term courses address various topics in the field of Tool Engineering, Quality Control, Foundry, CNC Technology as well as CAD/CAM. Duration: 3 weeks to 6 months Skills development courses under central and state governments skill development programmes

Chapter II

Governance and Management Systems

This chapter assesses the autonomy given to the General Manager of the Tool-Room, guidelines of the Ministry of MSME and the level of interaction between DC MSME and the Tool-Room. The assessment includes the role of the Governing Council in the functioning of the Tool-Room. This is also to analyse how all these factors are contributing to the performance of IGTR.

Policy Goals and Direction

The aim of setting up the project is to assist the industry, primarily small scale and strive for self-sustainability. In recent times, the stress has been more on self-sustainability through cost recovery. The policy to primarily work to assist MSMEs in tooling stands diluted. As a result of policy orientation, IGTR has performed well in recovering costs and has reached a stage of cost recovery without depreciation. It is now striving to go beyond it to recover full costs including depreciation. Since the yield from training is more, activity concentrates there. During 2010-11, revenue (cash basis) from training and production was 22% and 74 % respectively of the total revenue; the balance was interest income, etc. Of the small share of production, only 50% came from tooling. While it is commendable that more than 70% of production related services were for MSMEs in 2010-11, the value in absolute terms was insignificant.

Monitoring by DC MSME is also meant to gauge financial performance with reference to yearly targets. While the number of MSMEs assisted is reported, targets have not been fixed. It is recommended to additionally track the value of assistance provided in order to add credence to the monitoring process. Parameters to be tracked could be value of tools and other assistance rendered, increase in productivity, decrease in rejection percentage, saving in costs etc., on account of the consultancy provided to the industrial units.

Autonomy of Institution

IGTR is set up as an autonomous society but is still, to a large extent, guided by Government policies and in some cases even Government rules and regulations. The decision making body Governing Council, meets once in a year on an average. Its meeting generally coincides with the Annual General Meeting convened for approving the annual accounts and annual reports. Decisions within its power therefore have to wait.

Suggestion has emerged during a meeting with DC MSME and with stakeholders at IGTR that one central apex body under DC MSME to administer all Tool-Rooms would improve governance and networking. This would be examined while consolidating management issues for all 10 Tool-Rooms.

Characteristics of Core Management Team

Core management team at IGTR is well knit and motivated under an able leader, the General Manager. Important Departments of Production, Training and Design are headed by Managers who

were promoted from within 2 to 3 years ago and have good command of their departments. Posts of senior managers are vacant. IGTR has a good policy in this sense to wait for a few years, watch the performance of Managers and then fill the vacancies of Senior Managers when Managers' elevation could be considered along with talent from outside.

Annual Targets

Yearly targets are fixed for the total revenue earned. A target is also fixed for the number of trainees to be trained. Monitoring of performance is done by the office of DC MSME. However, there has been no assessment of the market opportunity for services of IGTR. Targets are not linked to the market opportunity or to the desired level of impact on MSMEs. There should be targets for value of assistance to MSMEs and share of women in training programmes. Also, separate targets should be given for revenue from training and production activity. Table 2 shows the targets and achievements in 2010-11.

Table 2: Annual Targets and Performance

Service	Target	Achievement	Achievement
Persons trained	3300	3543	107%
Revenue - Training, INR in lakhs	--	510.56	--
Revenue - Production INR in lakhs	--	153.07	--
Interest and other income	--	25.59	--
Total Income	800.00	689.22	86%

Source: Action Plan report of IGTR

There is need to monitor the following targets to track the impact towards stated objectives:

- Number of MSMEs assisted in terms of tooling and other production services
- Number of consultancies to MSMEs to improve productivity, product design
- Value and impact of consultancy to MSMEs

Management System

IGTR is an ISO 9001–2008 certified organisation. There are Standard Operating Procedures (SoPs) covering the following areas:

- Quality Procedures
- Design of training courses
- Consultancy and Marketing
- Cost Estimation
- Order Processing from receipt o despatch
- Production Planning and Control
- Quality Control
- Corrective actions
- Rework
- Feedback from users
- Customer Satisfaction
- Evaluation of training programmes
- Preventive maintenance of machines
- Stores

The SOPs are being followed and audit is carried out periodically. During surveillance audit in 2010, four non-conformities were raised. These were duly closed and submitted to the auditors with documents to their satisfaction.

Procurement system

Limited range of tool steels is available locally. Suppliers in Mumbai, Pune and Nasik who can supply tool steel from reputed manufacturers worldwide are accessible. IGTR needs to follow the procurement guidelines laid down in the General Financial Rules (GFR) calling for quotations and decision making guided by L1 principle due to which suppliers tend to quote lower rates, sometimes compromising on quality. Procurement procedures tend to be lengthy. However, IGTR is able to overcome these by detailed description (specifications) of their requirement and expeditious actions so that materials are in position by the time tool design is completed which takes two to three weeks. Feasibility of rate contracts should be examined.

For capital goods, an action plan with details of equipment and related costs is prepared in consultation with local GC members and submitted to DC-MSME at the beginning of FY in consultation with Integrated Finance Wing of the MoMSME. It is then ratified by the Governing Council. However, there are instances, when request for funds is submitted, Integrated Finance Wing has raised objections at this stage although it was concurred by them before. Procedure needs to be simplified. Integrated Finance Wing must not object at advance stages once agreed to at initial stage. Since the capital goods are also procured on least cost basis, two bid systems should be used. It may be advisable to seek performance bank guarantee from the supplier for a limited period to ensure desired performance of plant and machinery.

Developing a procurement manual covering the operational details on above suggestions would be beneficial to improve efficiency and effectiveness of procurement.

Networking with other Tool-Rooms, Institutions and Alumni

IGTR can significantly improve networking with alumni which can lead to more business and placements as many ex-trainees eventually occupy decision making positions for tool planning and training in the industry. At present networking with other Tool-Rooms is through meetings of General Managers of Tool-Rooms which takes place once a year. To share the experiences such meetings should be held at Heads of the Departments level.

Interaction with DC MSME

DC MSME monitors the performance of Tool-Room. System is in place under which Tool Room submits the following reports:

- a) Performance report, submitted monthly. Against annual targets, following information is submitted for the month and cumulative during the year up to the month of report.

Revenue, expenditure, order position, delivery status, machine utilization, number of trainees and number of MSMEs assisted. Tool Room is required to explain the short falls, if any.

System brings out cost recoveries but not the impact and outreach to MSMEs. Instead of monitoring numbers it should bring out the value of assistance provided to MSMEs and highlights of the best 5 technology related assistance cases. System should also be evolved to monitor customer and trainee feedback of courses conducted.

- b) Annual action plan containing targets and funds needed during the year for recurring and non-recurring expenditure. It is prepared in consultation with local members and submitted to DC MSME who approves the same in consultation with Integrated Finance Wing of the Ministry. It is then put to Governing Council for ratification. Role of Governing Council is limited to local members who are consulted. Ratification is a formality.

- c) Monthly status of courts cases in which DC MSME is respondent.

- d) Annual Report which includes audited annual accounts for placement before the Parliament.
- e) Information on innovative work done. This is used for preparation of Cabinet Note on performance of MoMSME.
- f) Annual manpower status.

Decision Making

Management of the Tool Room is with the Governing Council. However it meets once in a year, on an average, when convened to pass Annual Accounts and Annual Report. These meetings are generally held away from the Tool Room premises. Also representatives of industry are not found to be taking interest in decision making and it is generally the officials from MoMSME and state Govt. who deliberate in the meetings. Members other than officials are volunteers. It is needed that the structure is revised in favour of greater percentage of independent members with no personal or professional relation with Tool Room for greater ownership and effectiveness of Governing Council e.g. representatives from universities and technology leaders. They should be paid honorarium for their services.

While expectations from IGTR are similar to those from a private commercial Tool Room, it is not allowed a similar level of independence. The Tool Room is performing better, recovering full costs excluding depreciation, and striving to move beyond. When it recovers full costs including depreciation, it should have greater autonomy of a private tool room.

Chapter III

Organisational Assessment

This chapter assesses the service portfolio, technological infrastructure, marketing, finance, management systems, human resource and their impact against the stated policy goals. This chapter also analyses factors contributing or hindering the performance of IGTR Ahmedabad in achieving its stated objectives and the policy goal of enhancing competitiveness of manufacturing MSMEs through tooling services and availability of skilled manpower.

Overview of Services

The services currently being offered are given in the table below.

Table 3: Service Mix

Production		Training ²
Tools	Job work	
• Design and development • Manufacturing of Tools: -Moulds -Press tools -Die Casting Dies - Jigs, Fixtures -Gauges. • Trials of Tools • Repair of Tools • Inspection of Tools • Modification of Tools • Rapid Prototyping	• Common facilities in precision CNC machining operations • Common facilities in conventional machining operations • Inspection • Reverse engineering • Components • Standard Parts • Heat treatment • Plasma nitriding	• Long-term courses – Diploma Course in Tool & Die Making. Duration: 4 years. This course is approved by AICTE. – Certificate course in Machinist Tool Room. Duration:3 years – Certificate course in Tool Technology. Duration: 2 years – PG Diploma in Tool Design & CAD/CAM. Duration: 18 months – Seven certificate courses in various disciplines of tool engineering, CNC technology and Information Technology. Duration: 1 year • Short-term Courses (Less than one year) The short-term courses address various topics in the field of Tool Engineering, Quality Control,

² List of long-term and short-term courses conducted by IGTR is in Annexure II.

Production		Training ²
Tools	Job work	
		Foundry, CNC Technology as well as CAD/CAM. Duration: 3 weeks to 6 months. • Skill Development Programmes for Central and State Governments
In addition to the above IGTR also provides consultancy and mentoring support to MSMEs to improve productivity by use of better tools and/ or better production processes.		

The Table 4 below indicates the cluster served by IGTR in production-related services.

Table 4: Clusters Served

Type of tools/ services	Industry Cluster				
	Plastic/ Rubber	Auto Components	Hand Tools	Fasteners	Textile
Moulds	√		√	√	
Press Tools					
Jigs, fixtures, gauges	√				√
Job work		√		√	
Rapid Prototyping	√	√			
Heat Treatment	√	√	√		√

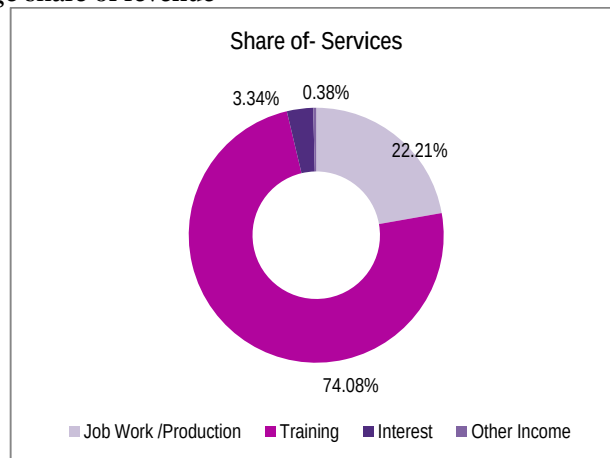
Contribution

The breakup of revenue contribution from various services in 2010-11 is given in the table below:

Table 5: Revenue Contribution

Services	Contribution, INR in lakhs
Job Work/Production	153.07
Training	510.56
Interest	23.00
Other Income	2.59
Total	689.22

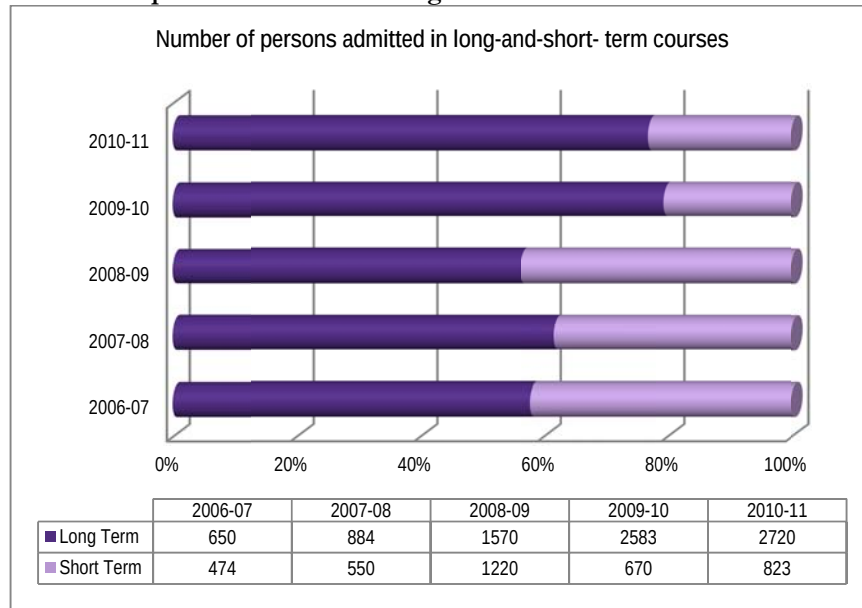
Figure 1: Percentage share of revenue



Training

IGTR Ahmedabad enjoys strong reputation in training with a good demand for training courses. During 2010-11, 3543 persons were trained. Trainees in long-term courses have increased in higher proportion than in short-term courses. Pattern is shown in Figure 2.

Figure 2: Number of persons admitted in long-and short-term courses



Revenue generation per employee is better in training in comparison to production. With 12% employees, training is generating 74% of the total revenue. There has come about a change in the awareness on skill development. Industrial units depute employees to improve their skills. A number of fee concessions and scholarships are available and so are the Government sponsored skill development programmes where fees are paid by the Governments. Trend of sources of flow of fees is indicated in Figure 3, while Figure 4 indicates share of fees from long-term and short-term courses. Break-up in value terms between long-term and short-term courses is highlighted in Figure 5.

Figure 3: Sources of Trainees Fees

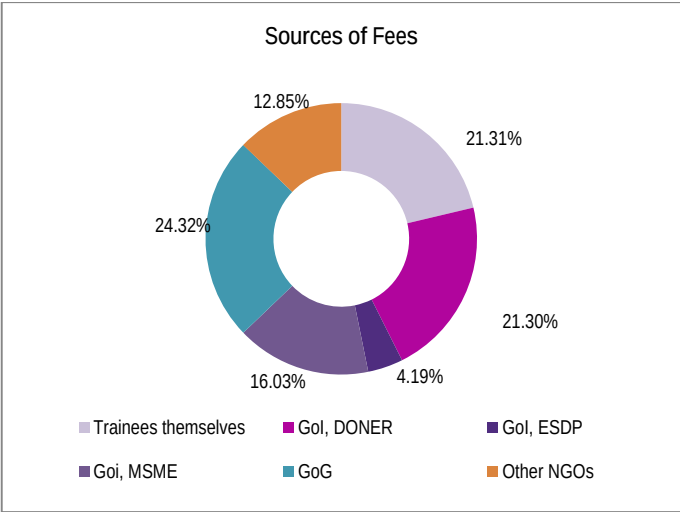


Figure 4: Share of fees from long-term and short-term courses in 2010-11

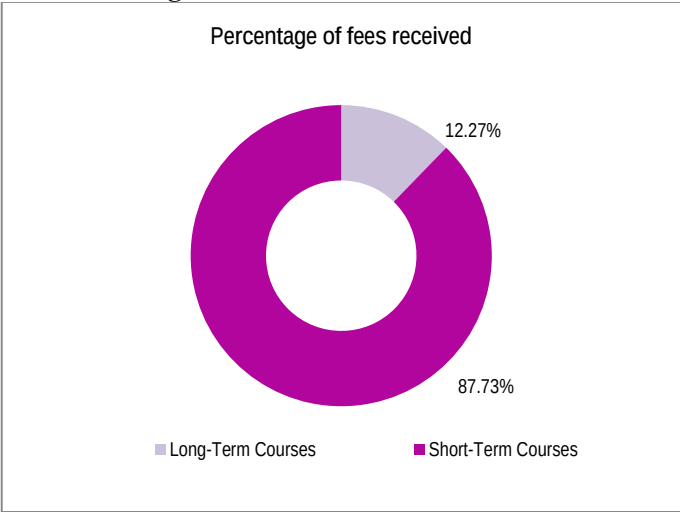
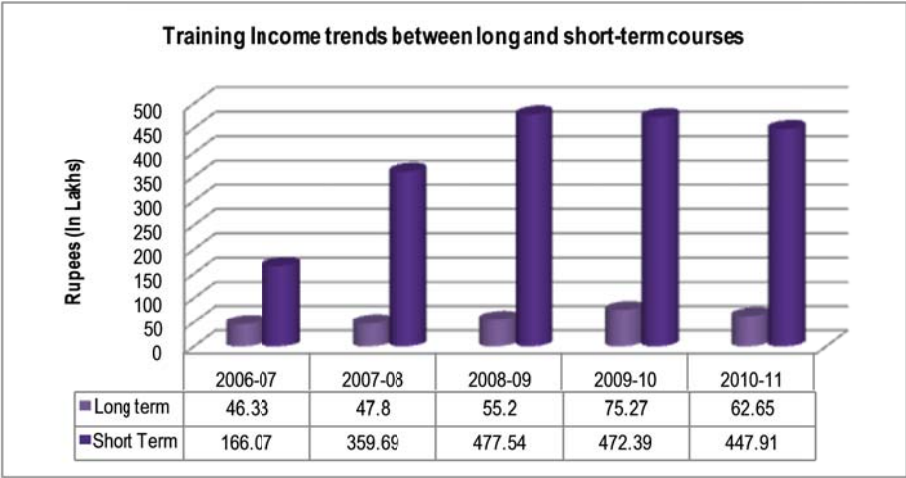


Figure 5: Training income trends between long- and short-term courses



While payment of fees by Government agencies is welcome for skill development, Tool-Room has to be cautious. If due to change of policy Government stops financing fees in these training courses, it could become difficult for IGTR to fill the gap at a short notice.

Placements

Placement records are an indicator of reputation of a training institute. It is arranged for long-term trainees. For Diploma Course in Tool and Die Making, placement of IGTR trainees is 100% excluding those who do not desire placement because they want to go for higher education leading to degree in engineering. For other long-term courses it is 70% to 80 %. Short-term trainees are from industry or colleges and polytechnics and go back to these institutes for completing their courses.

Post Placement Tracking

Post placement tracking is not on strong footing. It is limited to feedback at the end of one year of completion of training. Networking with alumni will be useful for marketing of Tool-Room services.

Pricing of Services

Tooling and Job Work

The pricing for any tooling job and production/job work is calculated on the following formula:

Cost = $(\sum \text{Machine hour rates} \times \text{Number of hours on machines/cost centres}) + \text{cost of raw materials}$

Machine hour rates were calculated taking into account the following components:

- Depreciation
- Direct labour
- Indirect labour
- Costs of raw materials and other direct consumables
- Factory overheads
- Administrative overheads
- Margin

But machine hour rates were fixed on the basis of detailed calculations in 1998 and were last revised more than 10 years ago. All costs involved, have changed since then. Engagement of machines is now longer; fixed costs will therefore be more spread. There is need to revisit the machine hour rates. Quotations are prepared on the basis of cost of raw materials and cost of machining based on machine hour rates. A margin is added to cover rejections and rework. No discount is allowed to MSMEs.

Of the three factors important to industry for tooling, users find IGTR quality to be very good, delivery long but prices high, especially for micro and small units.

Training

- Training fees are worked out for long term trainees involving machine costs, man costs, consumables and overheads. These are approved by the Governing Council considering market conditions and capacity of the target group in view. These courses are highly subsidised.
- For short-term courses, fee is calculated on the basis of the thumb rule formula of Rs.5000 (Five thousand) per month of duration.

- No subsidy to MSMEs.
- Exemption to SC/ST trainees in tuition fees which is reimbursed by DCMSME.
- Also sponsored training programmes are paid by the sponsoring departments and organisations.

Marketing

System

IGTR has a separate Consultancy and Marketing Department. The market team for production services comprises 4 officials led by a Senior Engineer. Training courses are marketed by the training department. Each team is given annual targets which are approved by the Governing Council and DC MSME. Monthly progress review is carried out by General Manager and DC MSME.

Strategy

One-on-one meetings are held with representatives of users at IGTR and also through visits to regular and prospective customers. Tooling requirements are discussed in detail and after all technical clarifications prices are quoted and commercial clarifications given, if needed. An advance of 40% is taken with the order as security since tools are customer specific. Other means of marketing are:

- participation in exhibitions
- presentations in meetings of associations of industry
- presentations in seminars
- insertions in news papers
- mail
- online through website³

Constraints

Organised and systematic need assessment of the market available to IGTR and its segmentation has not been done. Such a study needs to be done to provide leverage to IGTR in marketing.

Client Profile

Given the profile of industry in Gujarat and adjoining states, maximum demand for tooling is for moulds and press tools, etc. IGTR has developed expertise in moulds for plastics and metal (die casting dies). The break up for spread of products for the last five years is given in the table below:

Table 6: Spread of products, values

Products Spread	2006-07	2007-08	2008-09	2009-10	2010-11
Moulds for plastics, metal	40.02	8.63	32.01	78.40	63.81
Press Tools	6.65	16.65	-	-	-
Jigs, Fixtures	-	1.07	7.86	2.83	-
Components	28.53	0.78	2.21	1.88	7.85
RP, Design, Product Development	47.97	57.66	73.15	58.72	78.02
Others (Heat Treatment)	1.99	1.30	3.00	4.49	2.54

Types of Industries Served – MSMEs assisted

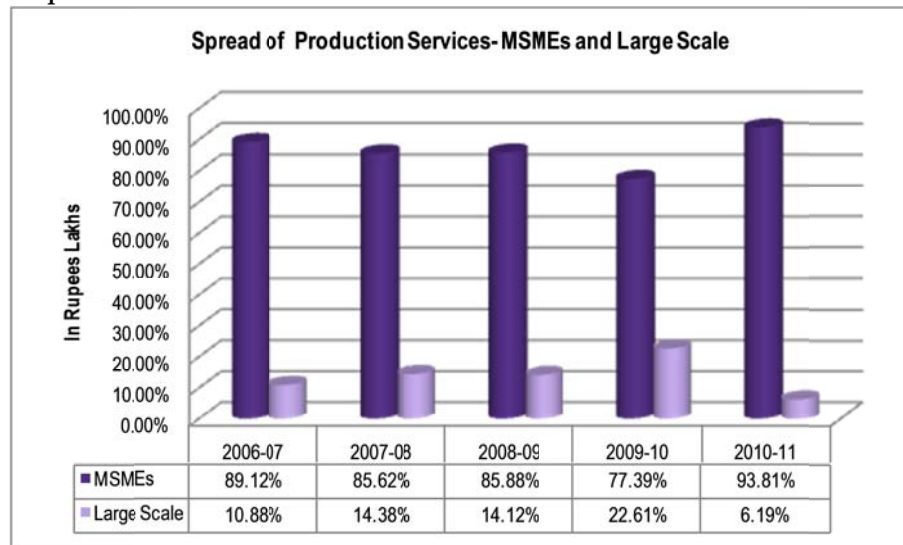
³ <http://www.igtrahd.com>

The share of MSME customers of IGTR has been fluctuating between 86% and 94%, with 94% in 2010-11. The table and figure below provide trends on share of MSME customers to total customers of IGTR.

Table 7: Industry Break up of IGTR Ahmedabad

Type of Industry	2006-07	2007-08	2008-09	2009-10	2010-11
MSMEs	89.12%	85.62%	85.88%	77.39%	93.81%
Large Scale	10.88%	14.38%	14.12%	22.61%	6.19%

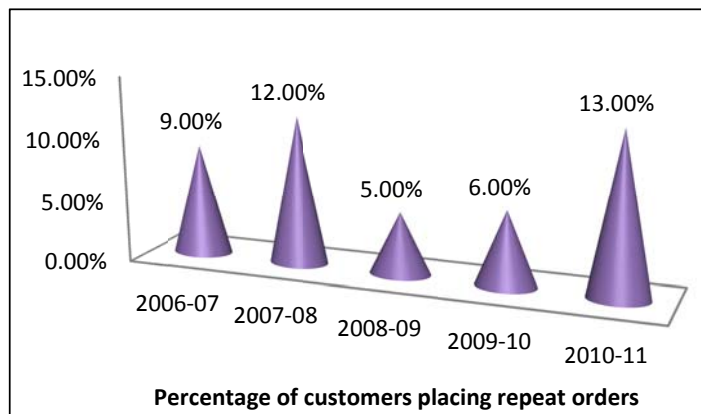
Figure 6: Spread of Production Services



Proportion of Repeat Orders

IGTR does not score well on customer satisfaction and retention because most of IGTR's tooling orders come from non-repeat customers. In 2010-11, only 13% of the total orders received were from repeat customers.

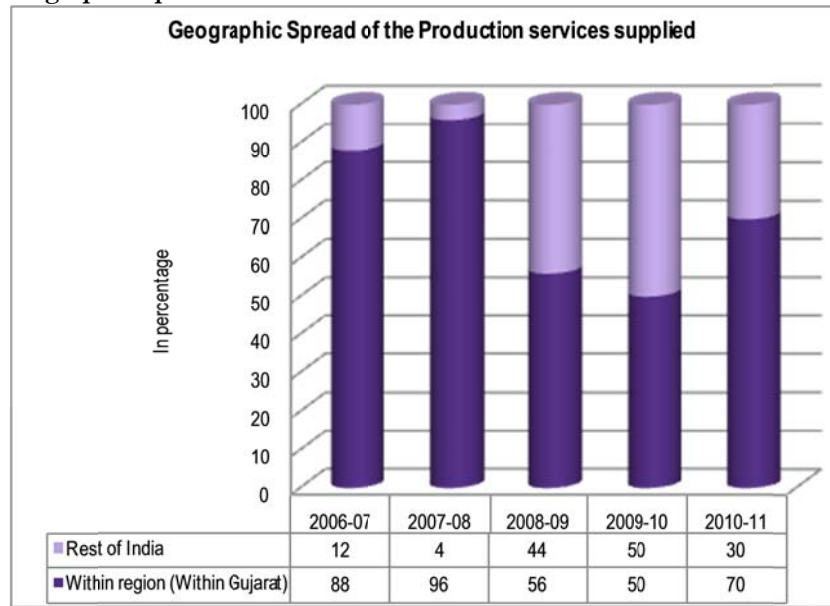
Figure 7: Repeat Customers



Geographic Spread of the assisted for tooling services

IGTR is en-cashing its reputation for quality products. It does not have to go far to sell its products. Majority of these assist the industry in the region, except in 2009-10. IGTR serves the region for what they were set up. Trend is shown in Figure 8.

Figure 8: Geographic Spread of Production Services



Physical and Technical Infrastructure

Physical Infrastructure

IGTR is a well-equipped public commercial Tool-Room in the Western Region. It is located in the industrial area developed by Maharashtra Industrial Development Corporation in Chikalthana in Ahmedabad. The total built up area of IGTR is 8310 square meters. The built up area for various departments is given below:

Table 8: Building Areas in square metres

Facility	Area
Production Services including Design, Marketing, Administration, Accounts	3225
Auditorium and Guest House	947
Training excluding hostel	1641
Hostel	2277
Others	220
Total	8310

Expansion planned for the next three years:

- new hostel, capacity 180
- expansion of training department with building

Utilities

IGTR has an electrical sub-station, an air conditioning plant, submersible pump and tank for water supply. IGTR has power backup which can feed all the critical equipment in case of power cut by the State Electricity Board.

Equipment in Production-related Services Sections

Under Indo-German Technical Co-operation Programme, IGTR was equipped with high-tech equipment needed at that time. Subsequently, the plant and machinery has been augmented and upgraded from time-to-time. It now has all equipment required at a modern tool-room⁴, like:

- CNC Wirecut, Charmillies Robo 510, weight carrying capacity: 1 ton, accuracy: $\pm 0.01\text{mm}$
- CNC Milling, Deckel 70V, weight carrying capacity: 0.7 ton, accuracy: $\pm 0.02\text{mm}$
- CNC EDM, Charmillies Robo 40, weight carrying capacity: 0.7 ton, accuracy: $\pm 0.02\text{mm}$
- Plasma Nitriding, Milman, weight carrying capacity: 200 kg
- Rapid Prototyping, Fortus 360 MC
- Surface and cylindrical grinders
- CAD/CAM work stations
- CAD/CAM software: ungraphics, MasterCAM, Peps

Data is transferred from CAD to CAM stations by CD, and from CAM workstations to CNC machines through Wi-Fi.

Appropriateness of Technology in Production related Services Sections

The available equipment at IGTR has the capacity to meet majority demands with respect to accuracy, complexity and physical size of tools. It has a capacity to machine 1-tonne tool part/work piece in CNC milling and wire cut machines. In metrology, the co-ordinate measuring machine can check parts weighing 1.2 tonnes. The equipment gives an edge to IGTR to manufacture medium range tools of which there is market from auto component industry.

Design Department plays an important role in the success of a tool-room. Its services include product design and tool design before the tools are taken up for production. Given the nature of MSMEs, this is a major area of strength of IGTR. The MSMEs typically come with the component expecting the Tool-Room to prepare the tool design to produce that component. Without design skills it is difficult to service such MSMEs which are significant in number. IGTR's design office is well manned and equipped. Design Office has simulation software and personnel to use it for the following advantages:

- percentage of tools successful in first trials tends to improve
- time and labour spent on rework or remake of rejected or defective parts is reduced
- delivery times are reduced

Equipment in the Training Department

Training Department at IGTR is equipped with men and equipment to conduct training programmes to meet the needs of the Industry. Equipment includes conventional machines as well as CNC machines of a general engineering workshop. The department has typical tool-room equipment like:

- CNC Wire EDM Machines
- CNC EDM Machine
- CNC Milling Machine
- Conventional milling machines
- Conventional lathes

⁴ List of important and high-value machines is in Annexure III.

- CAD/CAM work stations
- CAM SOFTWARE: UNGRAPHICS, MASTERCAM, MTS, SINUMERIK
- CAD SOFTWARE: SOLID EDGE, PROE, CATIA, UNIGRAPHICS, MASTERCAM, AUTOCAD
- FMS LABORATORY
- HYDRAULIC LABORATORY
- PNEUMATIC LABORATORY

Work stations of teacher and trainees are on LAN. This facilitates the teacher to check CNC programmes being made by the trainees at any given time and adds value to the training programmes in CAM.

Human Resources

Strength of employees in IGTR is 85. In addition to the General Manager who is the Chief Executive, IGTR has the following personnel:

Table 9: Personnel

Designation / Department	Manager	Sr. Engineer	Foreman/ Engineer*	Technician	Others
Administration			3		9
Marketing		1	2		1
Design& CAD/CAM	1		2		1
Production#	1	1	9	41	
Training	1	2	5		2
Heat Treatment		1			
Quality Control		1			
Sub-Total	3	6	21	41	13
Total	84 (85 including General Manager)				

*Includes Officers in Administration & Accounts at similar level # Includes Maintenance

Vacancies and requirement:

IGTR has 4 posts of Senior Managers which are vacant. These can be used for future career planning. Present team is well knit and effective. Turnover is not an issue.

Skill up-gradation/capacity building

Skill and knowledge development programmes are needed for existing employees. Apart from acquiring new skills and knowledge such programmes enhance employee motivation. IGTR management organises training and skill development programmes as a regular feature for all category of employees. Types of such programmes are mentioned below:

- CAD/CAM/CAE
- Rapid Prototyping
- Benefits of CAE in product development
- 5 S and Kaizen
- Lead Auditor Training for ISO certification
- Modern Technologies

Retention

Good HRD policies keep the employees with IGTR for a reasonable period. The retention pattern is reflected in the Table 10.

Table 10: Retention Pattern

	Number of years at IGTR Ahmedabad			
	Above 15	10 to 15	5 to 10	Less than 5
Number of Employees	50	19	8	8

Incentive System

Tool-Rooms under DC MSME have been allowed to adopt incentive schemes based on the overall guidelines and limits decided centrally by DC MSME. This is a group incentive scheme and does not take into account individual performance. The scheme lays stress on increasing generation of surplus of income over expenditure, 25% of which is allowed to be distributed to the employees. There are restrictions on maximum amount payable, 3 months' salary if a Tool-Room has recovered cost without depreciation and 4 months' salary if it has recovered cost including depreciation. Distribution is further based on the following factors:

- Salary= Basic Pay + Grade Pay +Dearness Allowance subject to maximum ceiling on basic pay of Rs.8560; those with basic pay of more than Rs.8560 are paid incentive based on Rs.8560 basic pay (revised after implementation of 6th Pay Commission Recommendations)
- Number of days of attendance in the financial year over the Tool-Room working days
- There is a maximum ceiling on payment of four months of Basic Pay + Grade Pay + Dearness Allowance subject to maximum ceiling on basic pay of Rs.8560
- Contractual employees are also paid incentive based on the number of days they have worked and their wages
- Ad-hoc and contractual employees are also covered, but at a different (Lower) scale

IGTR has introduced incentive scheme based on above guidelines which has motivated employees. At present it falls under the category of Tool-Rooms which have recovered costs without depreciation and thus there is a ceiling of three month's salary on the amount of incentive payable to employees. For the year 2009-10, a sum of Rs.30 lakh was payable to employees subject to attendance factor as brought out above. This was paid in 2010-11.

Tool-Room work is non-repetitive. Routing and scheduling differ with every tool part. Individual incentive scheme, although more effective, is difficult until a high level FMIS is developed. This should be examined. A department-wise performance on cost recovery varies appreciably. Training, with less than 12% employees has generated 74% revenue in 2010-11 but is under the same scheme.

Operational Efficiency

Quality, Lead Time and Price:

IGTR, Ahmedabad is known for the quality of its tooling and other production work. Associations and industrialists using IGTR also find the price level high and deliveries long.

Machine Utilisation

Utilisation data for 16 critical machines at IGTR in production-related services were examined. Out of these, one Co-ordinate Measuring Machine is for inspection which as per industry norms is not engaged round the clock. It is used in one shift. Data was analysed for utilisation. Ideally and as per

industry norms, critical machines should be used round the clock. Since Tool-Room operations are non-repetitive and all tool parts need different routing and scheduling, IGTR should aim to achieve 85% utilisation of this. IGTR's position is as below:

Table 11: Machine Utilisation

Description	Number of hours
Installed capacity as per Industry norm ⁵	110428
Number of hours attended	57823
Utilisation of the machines	52 %

Machine utilisation works out to be 78% if working in two shifts is accepted. But the utilisation projected above indicates hours for which the machines were attended. For better monitoring IGTR should additionally keep and analyse data used for booking, consumption of hours within booking, rejection/ rework, hours under maintenance including preventive maintenance and idle hours when machines could not be loaded with jobs. IGTR can bring down their price by working in more shifts to spread the overheads more evenly, over more working hours.

Financial Analysis

Grant Thornton obtained audited financial statements of the five financial years ending March 31, 2010 for Central Tool Room, Ahmedabad. The analysis was done on the following parameters:

1. Net worth
2. Profitability and composition
3. Trend of income and expenditure

Net worth

The net worth of an enterprise is the sum of total equity and retained earnings. Net worth reflects the value of the enterprise, considering it is composed primarily of the money that has been invested in the enterprise since its inception, as well as the retained earnings for the duration of its operation.

Table 12: Net Worth with Government Grants

Particulars	2005 - 06	2006 - 07	2007 - 08	2008 - 09	2009 -10
Net worth	209,888,168	196,370,882	215,920,207	232,824,516	262,879,223
Year-on-year increase		-6%	10%	8%	13%

The net worth of IGTR, Ahmedabad has been increasing every year on an average of 6%, which is a healthy sign as it implies an increase in equity or value of the Tool Room. During the years the Tool-Room was also in receipt of Government grants during the year.

Following is the trend of government grants being received by IGTR, Ahmedabad:

Table 13: Government Grants

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10

⁵ Calculation of installed capacity:

Days in a year	=	365
(Less) Sundays	=	(52)
Holidays	=	(17)
Net working days	=	296
Number of Hours on 24x7 basis (296*24) per machine	=	7204
Number of hours for 11 m/cs 7204*15	=	108060
Number of hours for 1 CMM 8*296*1	=	2368
Total Number of hours	=	110428

Contribution from GOI	16,000,000	17,100,000	25,000,000	24,000,000	30,000,000

Net worth of the Tool-Room excluding the Government grants received is provided in the table below:

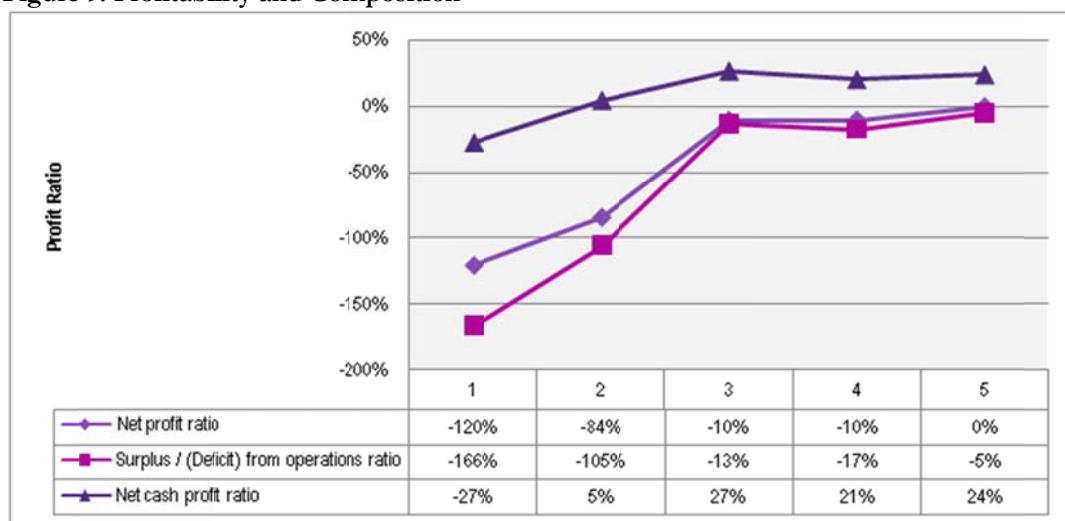
Table 14: Net Worth without Government Grants

Particulars	2005 – 06	2006 – 07	2007 - 08	2008 - 09	2009 -10
Net worth excluding government grants	193,888,168	163,270,882	157,820,207	150,724,516	150,779,223
Year-on-year increase		-16%	-3%	-4%	0%

The Net worth of the tool room has been declining without Government grants. The revenues are not able to recover the costs and it is evident that the Tool -Room is in need of aid from the Government to sustain its operations.

Profitability and Composition

Figure 9: Profitability and Composition



The Tool-Room has been incurring a deficit from operations. The same reduced over the years from 166% in FY 2005-06 to 105% in FY 2006-07, 13% in FY 2007-08, 17% in FY 2008-09 and 5% in FY 2009-10.

Even after including other income, the deficit cannot be set off completely and the Tool-Room has a deficit even on an overall basis. However, the Tool-Room has broken even on FY 2009-10 where the income is enough to cover the total expenses and net profit ratio is 0%. The same is on account of an increase in the revenue of 18% compared to an increase in the expenses by a mere 5%.

However, the Tool-Room has been cash positive since FY 2006-07. The reason for the same is that depreciation is a non-cash expense and accounted for a major part of the total expense, averaging to 35% in the five years from 2005-10.

The salary costs have increased significantly on account of revision in the salaries of the employees in line with recommendations from the Sixth Pay Commission, which has led to an increased burden on the profitability of the Tool-Room. Where salary costs accounted for 29% of the total expenses in FY 2005-06, the same accounted for 48% of the total expenses in FY 2009-10. With the

increase in salary costs, the share of depreciation, accounted for one-fourth of the total expenses at 24% in FY 2009-10, down from 42% of the expenses in FY 2005-06.

The primary source of revenue has always been income from training and the same has increased from 51% of total revenue in FY 2005-06 to 77% of total revenue in FY 2009-10. The income from production and sale of moulds and dies and from services formed a considerable chunk of the revenue in FY 2005-06 at 42% but the same declined gradually, and in FY 2009-10 the same formed only 11% of the total revenue. Income from other sources comprises primarily of grant received from governments and interest income. Initially the interest income was marginal and the government grants were significant at Rs.40 lakhs in FY 2005-06 and Rs.29 lakhs in FY 2006-07. However, the grants stopped and the interest income grew significantly from Rs.8.24 lakhs in FY 2007-08, Rs.29.5 lakhs in FY 2008-09 and to Rs.34.5 lakhs in FY 2009-10.

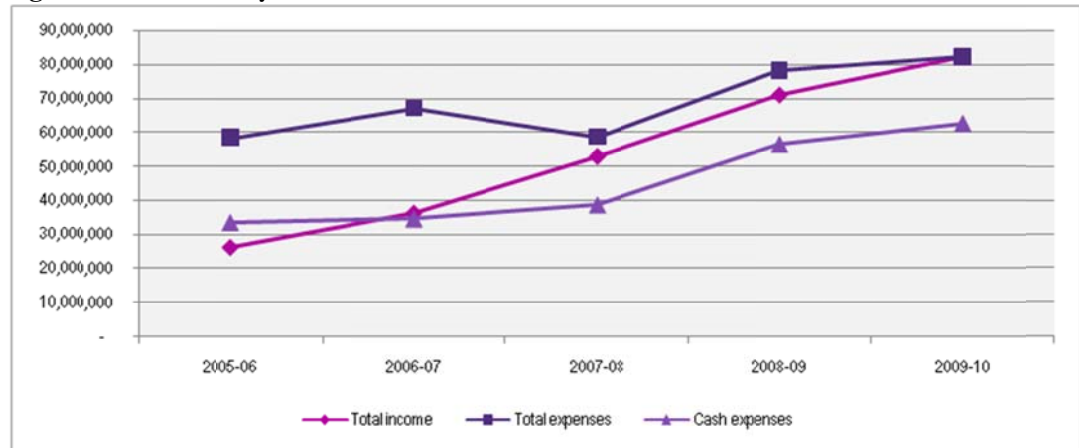
Trend of income and expenditure

Grant Thornton did a trend analysis of the income and expenditure of IGTR Ahmedabad based on the audited financial statements provided for the five years ending March 31, 2010. Given below is a diagram reflecting the relationship between the income, expenses and cash expenses:

Table 15: Trend Analysis

Particulars	2005 - 06	2006 - 07	2007 - 08	2008 - 09	2009 - 10
Total income	26,456,382	36,473,025	53,048,844	71,089,203	82,368,242
Total expenses	58,272,644	67,090,311	58,499,519	78,184,894	82,313,535
Cash expenses	33,596,558	34,672,136	38,710,982	56,418,354	62,520,196

Figure 10: Trend Analysis



The Tool Room has been operating at a deficit as the expenses are in excess of income. However, the income is increasing at a faster rate of 33% compared to the expenses which are increasing at an average of 10%. In FY 2009-10, the Tool-Room has managed to break even and generated a surplus of Rs. 54,707. Although operating in a deficit at an overall level, the Tool Room has still been generating a cash surplus FY 2006-07 onwards and the surplus has been increasing every year. The same can be seen from widening of the gap between the total income and the cash expense lines in the diagram.

Chapter IV

Overview of Local Business Environment from Tool-Room Perspective

This chapter assesses the location of the Tool-Room and the market potential for it to expand its services. It also analyses the availability of raw material and machinery suppliers in the region. Although Tool-Room has no control over these factors yet these factors do affect its working.

Location and Market Potential

MSME Indo-German Tool-Room is located in the industrial area at P-31, Maharashtra Industrial Development Corporation in Chikalthana, Ahmedabad. The Tool-Room has a strategic advantage from its location in Ahmedabad. The city and its nearby cities of Mumbai, Nasik, Pune have significant concentration of industries which are heavy users of press tools and forging dies; expertise on these is a USP for the Tool-Room. These users are automobile and auto component industries which are projected to grow at CAGR of 21%. Tooling demand will grow accordingly.

Backward linkages with raw material suppliers and machine suppliers are in the table below:

Table 16: Backward Linkages

Input	Linkage/ Sources
Raw Materials	Stockists in Ahmedabad. Main importers and stockists are based in Pune, Nasik and Mumbai.
Machine Tools	Manufacturers for indigenous machines. Direct imports for imported machines, nearly all such suppliers have agents in India for liaison and service back up. Some imported machines are also available on rupee payment in India from agents spread across the country.
Standard Moulds and Die sets	Manufacturers or stockists, mostly outside Ahmedabad. Some complex parts like hot tubes for hot runners, etc. are imported.
Cutting Tools	Manufacturers and stockists sufficiently present in Ahmedabad
Consumables like oils	Stockists in Ahmedabad
Spares	From OEMs except for standard spares like bearings
Servicing of CNC Machines	By the machinery suppliers. In case of imported machines, the service is provided by agents of the foreign suppliers through annual Maintenance Contracts which tend to be expensive or on visit basis. The latter is preferred by IGTR. Service agents are based at the headquarters of the agent and visit to attend machines on a need basis. Agents of a few foreign principals/suppliers have liaison offices in Ahmedabad which facilitates making expeditious arrangements.

Growth and Presence of Private Commercial Tool Rooms

There are a number of private commercial tool-rooms in and around Ahmedabad. Most of the commercial tool-rooms are small and specialise in specific areas. While private tool-rooms have flexibility in decision making like procurement of raw materials, consumables and equipment, they lack modern technologies like advanced CNC machining. Government Tool-Rooms cannot meet the gap between demand and supply of tools but it can act as a facilitator and encourage private commercial tool-rooms to expand their operations by using common facilities at IGTR. IGTR should support them in the following areas:

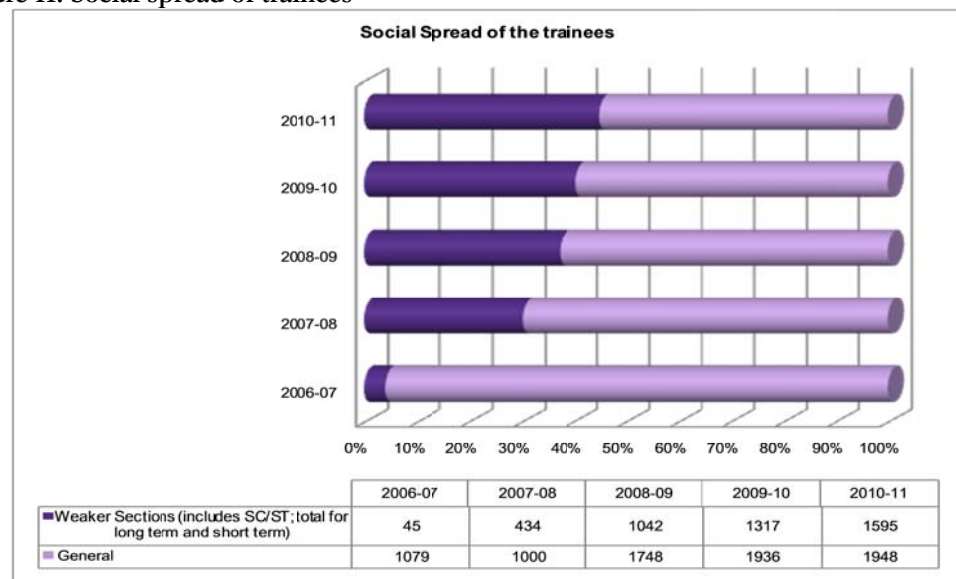
- Design and development of products and tools
- Developments of prototypes
- Making tool parts for which commercial Tool-Rooms do not have the facilities
- Assistance in programming of CNC machines to the extent available with these tool-rooms
- Assistance in selection of new equipment

Chapter V

Inclusive Growth underlined by Social Impact

IGTR has made a good impact in the areas of both tooling and training. It has trained 3543 trainees in 2010-11. IGTR attracts good response from economically weaker sections. There is rise in the number of SC/ST trainees at a much higher proportion than the general trainees. The reason is that they do not have to themselves pay the fees.

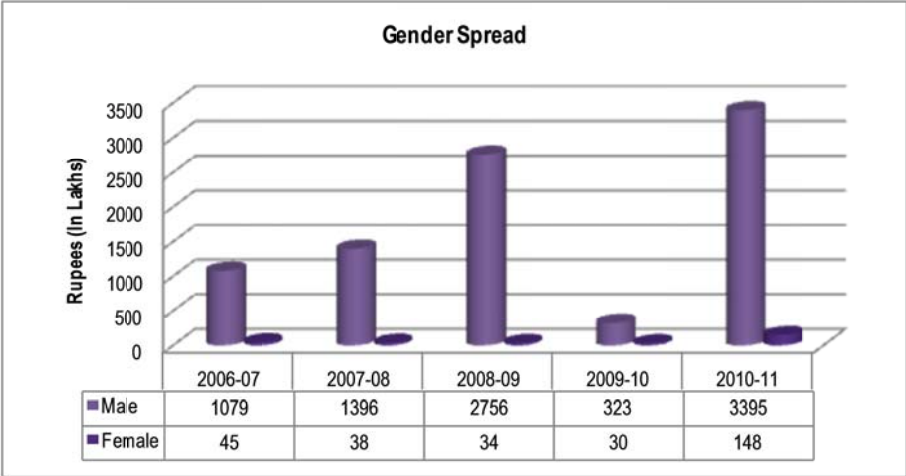
Figure 11: Social spread of trainees



Gender Spread

Gender spread in IGTR's training programmes is encouraging. 31% of the trainees admitted were females. Details are in Figure 12.

Figure 12: Gender Spread



Environment

Conventional nitriding is potentially very hazardous to environment due to poisonous chemicals like cyanides and ammonia. New technology of plasma nitriding is an environmentally benign surface treatment. It uses non-toxic and precisely controlled gas mixture. IGTR has introduced this technology which is a great contribution to environment protection, in addition to other technological advantages of selective hardening and more case depth.

SWOT

Strengths

- It has developed a good expertise in vocational training
- It is one of the most well equipped commercial Tool-Rooms in the Western Region
- It has versatile software packages in CAD/CAM and trained personnel to use the same
- It has a well trained team of engineers, operators and trainers
- IGTR is set up with development objectives and offers its services without commercial objectives
- No bank interest is required to be paid on funds invested in new equipment
- IGTR has a good training expertise and equipment
- An Incentive Scheme has been introduced

Weaknesses

- Machine utilisation is low
- There is limit on the amount of incentive which can be distributed although more amount is available/earned based on performance
- Limited use of Financial and Management Information systems
- Decision making body, Governing Council, meets less often than intended and needed
- Focus on design and manufacture of tools has diluted
- High price level and long deliveries of tools

Opportunities

- Industry attaches high value to IGTR's expertise in vocational training
- Significant scope for scaling up training and tooling services given the favourable market conditions
- Abundant demand for tooling. According to TAGMA tooling demand in the country is Rs.13225 crore
- Location in a growing industrial area with focus on auto components
- Huge requirement of trained manpower
- Government support for capital investment is available
- Government support in funding of fees payable by training under skill development programmes

Threats

- Monitoring based on indicators of self sustainability has diluted impact on MSMEs and so is the focus on design and manufacture of tools
- Easy procedures and low custom duty for import of tools. TAGMA's latest survey indicates that more than 30% tooling is imported in the country
- Low price levels and faster deliveries of tools from some countries, especially China and Taiwan
- MSMEs' preference for low cost tools

Conclusion

IGTR has made significant impact in creating skilled manpower. On financial front it is recovering full costs without depreciation and is striving further to recover cost with depreciation. It has also contributed significantly to environment protection. However, sustaining and scaling up the impact in the direction of assistance to MSMEs is critical and would be a major challenge given constraints like more easy money available from large industries and mandate to recover costs including depreciation.

The policy direction and monitoring indicators mainly give weightage to self-sustainability which needs to be revisited as the impact on MSMEs and job creation is of equal significance. Over emphasis on cost recovery and related financial indicators has danger of reduced impact on the MSMEs and skills development. It is also necessary that IGTR develops an understanding of the current and emerging MSME needs (especially local clusters) on both training and tooling fronts. A formal survey of the MSME market relevant to the IGTR is needed for this purpose. This would be essential to establish short- and long-term targets with an eye on the impact on MSMEs.

Annexure I

Details of Visits

List of official met during visit of GT Team to Ahmedabad

Name of the Organisation	Names of Officials	Designation
MSME Indo-German Tool Room, Ahmedabad	Shri Vinesh Swadia	General Manager
	Shri Ketan Panchal	Manager – Training
	Shri B. Srinivas Rao	Manager – Production
Commissionerate of Industries, Government of Gujarat	Shri H.D.Shrimali	Additional Industries Commissioner
Adweshwar Moulds Private Limited	Shri J.D.Mistry	Proprietor
	Shri R.K Mistry	Director
Gujarat State Plastic Manufacturers' Association, Ahmedabad	Shri Mahavir Khatang	President
	Shri Devang Mehta	Chairman, Technical Seminar Committee
	Shri Ramesh Thummar	Hon. Treasurer
Irrilink Irrigation Systems	Shri Lalaji Sankhala	Proprietor
Shri Bhagwati	Bhagwati Shero Cast	Managing Director

Annexure II

Training Courses

Training Courses at MSME INDO-GERMAN TOOL ROOM AHMEDABAD

Course	Duration	Fee/student	Support from Min. of MSME/ Others (State etc.)	Intake	Selection Criterion	Certification by
Long Term						
Diploma in Tool & Die Making (DTM)	4 years	1,20,000.00	SC/ST students fees reimbursed by ministry of MSME	60	10th pass with English Subject + Entrance Test	AICTE
Certificate in Machinist – Tool Room (CMT)	(2+1) years	45,000.00		40	10th pass with English Subject + Entrance Test	GCVT
Certificate Course in Tool Technology (CCTT)	2 years	80,000.00		40	10th pass with English Subject	IGTR
Post Graduate Diploma in Tool Design & CAD/CAM (PGTDC)	1½ years	75,000.00		25	Degree in Mechanical / Automobile / Plastic Engineering / Production Engineering	IGTR
Post Diploma in Tool Design &	1 year	50,000.00		25	Degree or Diploma in Mechanical / Automobile / Plastic Engineering / Tool &	IGTR

Course	Duration	Fee/student	Support from Min. of MSME/ Others (State etc.)	Intake	Selection Criterion	Certification by
CAD/CAM (PDTDC C)					Die Making	
Post Diploma in CAD/CAM (PDCC)	1 year	50,000.00		25	Degree or Diploma in Mechanical / Production / Plastic Engineering / Tool & Die Making	IGTR
Post Diploma in Computer Aided Engineering (PDCAE)	1 year	50,000.00		25	Degree or Diploma in Mech. / Production / Electrical / Electronics / Mechatronics Engg.	IGTR
Post Diploma Certificate in CNC Machine Maintenance (PDCMM)	1 year	50,000.00		25	Degree or Diploma in Mechanical / Production / Electrical / Mechatronics Engineering.	IGTR
Post Graduate Certificate in Information Technology (PGCIT)	1 year	50,000.00	Sponsored by Govt. of Gujarat	25	Degree in any Discipline	IGTR
Certificate Course in CNC Machinist with Foundation (CCM-F)	1 year	40,000.00	Sponsored by Govt. of Gujarat (Dept. of Tribal Development & Dept. of Social Welfare).	40	10 th pass	IGTR
Certificate Course in	1 year	40,000.00	SC/ST students	25	10th Pass or ITI (Fitter / Draftsman)	IGTR

Course	Duration	Fee/student	Support from Min. of MSME/ Others (State etc.)	Intake	Selection Criterion	Certification by
Tool Design Drawing (CTDD)			fees reimbursed by min. of MSME			
Short Term						
Master in CAM & CNC Technology (MCCT)	6 months	35,000.00	SC/ST students fees reimbursed by ministry of MSME	25	ITI / Diploma in Engg.	IGTR
Post Graduate Certificate in Inspection and Quality Control (PGCIQC)	3 months	20,000.00		25	Degree in Science (BSc) Pref. Physics, Maths, Chemistry	IGTR
Certificate in CNC Machinist (CCM)	4 months	20,000.00		25	ITI or M/c operator with 2-3 years exp.	IGTR
Certificate Course in Foundry Technician (CCFT)	6 months	30,000.00		30	10 th pass	IGTR
Certificate Course in Co-ordinate Measuring Machine Operator (CMMO)	4 months	20,000.00		25	ITI or its equivalent	IGTR
Master CAM	5 weeks	10,000.00		10	ITI/Diploma/Degree in Engg.	IGTR
PRO-E	3 weeks	10,000.00		10	ITI/Diploma/Degree in Engg.	IGTR
CATIA	4 weeks	10,000.00		10	ITI/Diploma/Degree in Engg.	IGTR
Auto	4 weeks	4,000.00		10	ITI/Diploma/Degree	IGTR

Course	Duration	Fee/student	Support from Min. of MSME/ Others (State etc.)	Intake	Selection Criterion	Certification by
CAD					in Engg.	
Unigraphics	5 weeks	18,000.00		10	ITI/Diploma/Degree in Engg.	IGTR
Skill Development programmes on Turning, Milling, Grinding	6 months	15,000.00	ministry of MSME & MOIA	25 each	7th pass	IGTR

Annexure III

Equipment

List of high Value Machines at MSME IGTR Ahmedabad

Sl. No.	Description of machine	Max. Job Weight in tons	Axes	Accuracy in mm
1	CNC Vertical Milling	1.5	3	± 0.02
2	CNC Vertical Milling	1.0	3	± 0.02
3	CNC Vertical Milling	0.7	3	± 0.02
4	CNC Vertical Milling	0.7	3	± 0.02
5	CNC Vertical Milling	0.7	3	± 0.02
6	CNC Vertical Milling	0.5	3	± 0.02
7	CNC EDM	0.7	3	± 0.02
8	CNC EDM	0.5	3	± 0.02
9	CNC WIRECUT	1.0	3	± 0.01
10	CNC WIRECUT	0.5	3	± 0.01
11	RPT	--	--	± 0.177
12	CMM	1.2	3	± 0.005
13	Plasma Nitriding	0.2	--	
14	Injection Moulding	2.0 (clamping pressure)	--	
15	Injection Moulding	0.8 (clamping pressure)	--	
16	Milling	0.5	universal	± 0.05



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Strategic Assessment of MSME Tool Rooms

As Is Assessment Report – IGTR Aurangabad

Prepared for

**Micro, Small and Medium Enterprises
Umbrella Programme**



Knowledge Partner:



Grant Thornton

Contents

	Page
Abbreviations Used	5
Executive Summary	7
Introduction	9
Chapter I Organizational Profile	11
Chapter II Governance and Management Systems	13
Chapter III Organisational Assessment	17
Chapter IV Overview of local Business Environment from Tool-Room perspective	33
Chapter V Inclusive Growth underlined by Social Impact	35
SWOT	37
Conclusion	38
Annexure I Details of Visits	39
Annexure II Training Courses	40
Annexure III Production Equipment	43
Annexure IV Training of Personnel	45

Table 1: IGTR Profile.....	11
Table 2: Annual Targets and Performance.....	14
Table 3: Service Mix of Aurangabad	17
Table 4: Service - Sector Mix	18
Table 5: Break-up of Revenue Contribution.....	18
Table 6: Sources of training fees	20
Table 7: Spread of tools produced from 2006-7 to 2010-11	22
Table 8: Industry Break-up of revenue	23
Table 9: Building Areas.....	24
Table 10: Power-Back up	25
Table 11: Personnel.....	26
Table 12: Retention Pattern	27
Table 13: Machine Utilisation.....	28
Table 14: Net Worth with Government Grants.....	30
Table 15: Government Grants	30
Table 16: Net Worth without Government Grants.....	30
Table 17: Backward Linkages	33
Figure 1: Share of revenue	19
Figure 2: Number of persons admitted in long-and-short-term course	19
Figure 3: Training Income from various courses	20
Figure 4: Repeat Orders.....	23
Figure 5: Geographic Spread of trainees.....	24
Figure 6: Profitability and Composition	30
Figure 7: Trend of income and expenditure.....	31
Figure 8: Trend of income and expenditure.....	31
Figure 9: Social Spread of trainees in long-term courses	35
Figure 10: Gender Spread	36

Abbreviations Used

AICTE	All India Council of Technical Education
CAGR	Compound Annual Growth Rate
CAD	Computer Aided Design
CNC	Computer Numerical Control
CAM	Computer Aided Manufacturing
CMM	Co-ordinate Measuring Machine
D	Dimensional
DC	Development Commissioner
DG	Diesel Generating
EDM	Electric Discharge Machining
ESPD	Entrepreneurship & Skill Development Programme
FMIS	Financial & Management Information System
FY	Financial Year
GFR	General Financial Regulations
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GOI	Government of India
HOD	Head of Department
HRD	Human Resource Development
HT	Heat Treatment
IGTR	Indo-German Tool Room
ISO	International Standards Organisation
IT	Information Technology
ITI	Industrial Training Institute
IMTEX	India Metal-cutting Machine Tool Exhibition
IITF	India International Trade Fair
L 1	First Lowest
LAN	Local Area Network
M/c	Machine
MIS	Management Information System
MoMSME	Ministry of Micro, Small and Medium Enterprises
MSME	Micro, Small and Medium Enterprises
NTTF	Nettur Technical Training Foundation
OEM	Original Equipment Manufacturers
OHSAS	Occupational Health and Safety Assessment Standard
PG	Post Graduate
SOP	Standard Operating Procedure

Executive Summary

MSME Indo-German Tool-Room at Aurangabad is one of the four set up under Indo-German Technical Co-operation Tool-Room Programme, for design and manufacture of tools and training of manpower in employable skills in tool making and allied trades. It is operating as Government of India Society under Chairmanship of DC MSME since 1990. During the collaboration period total investment in the project was Rs.61.20 crores of which Governments of India, Germany and Maharashtra contributed Rs.20.84 crores, Rs.29.52 crores and Rs.10.84 crores, respectively. State of the art tool-room equipment is installed at IGTR which includes high end tool machines like jig boring, CNC machining centres, CMMs, and heat treatment furnaces.

IGTR's operating income and expenditure without depreciation in recent years is as below;

Rs. in lakhs

Year	2006-07	2007-08	2008-09	2009-10	2010-11
Income	759.18	956.87	1057.43	1275.87	1513.08
Recurring Expenditure	616.83	724.74	822.03	1016.16	1160.82
Income minus expenditure	142.35	232.13	235.39	259.71	352.26

IGTRs revenue has increased at an average rate of 18% over the last 5 years. Cash expenses during the same period increased at 15 %, signifying that the gap between income and expenditure continued narrowing down. In 2010-2011 income was Rs.1513.08 crores while the expenditure was Rs.1160.82 crores without depreciation and Rs.1497.76 with depreciation. IGTR, thus, recovered at full costs and generated a surplus of Rs.15.32 lakhs. No Government grant-in-aid was sanctioned to the Tool-Room during this year. Training contributes around 40 % to the revenue with 20% employees.

IGTR is doing well in assisting MSMEs whose share in terms of revenue in production related services has steadily gone up from 58% in 2006-07 to 73% in 2010-11. In 2010-11, IGTR trained more than 4000 personnel in its training programmes.

IGTR has manpower of 91. A hard working and motivated team, led by a General Manager, is in position. They have tapped the market and have earned a good reputation for IGTR which is regarded as a Centre of Excellence. The staff has ensured that Tool-Room achieves full cost recovery including depreciation with their performance.

An incentive scheme has been introduced to motivate employees towards better performance. About 4 months' salary is likely to be paid as incentive for performance during 2010-11, subject to some ceiling on the maximum amount, which is also understandable. This is the only Tool Room where a well compiled Personnel Policy Manual has been brought for information of all employees. It is being updated, last amendment is dated 01.01.2011. Communication channels are well defined. There is a systematic approach to depute employees for skill and management development programmes.

If capacity is calculated on three shift basis, which is the industry norm for expensive equipment, utilization of expensive and critical machines is 47%. IGTR is presently working in two shifts, in general. If capacity is calculated on two shift basis, machine utilisation is 70%. Maintenance and idle times are on higher side, 11.2% and 14.5%, respectively, of the attended hours. A more effective preventive maintenance system is needed.

IGTR's objectives are to assist MSMEs of the region to enhance their competitiveness by providing high quality tools, common facilities in machining and heat treatment, consultancy to increase the quality and productivity of their products, training young men for the industry and to sharpen skills of existing employees from the industry. However, for sometime, stress has been more on cost recovery for which targets are fixed. In spite of this IGTR management directs its efforts so as to assist MSMEs, ensure production share to be 50% of revenue, tooling share to be 50% of production and training fees paid by trainees to be 50% of total fees.

IGTR being a Government of India Society has to work under its guidelines of the Government. But there are areas in which the autonomy built into the system is also not effectively used. Some of the key challenges, constraints and solutions are enumerated below:

<u>Function</u>	<u>Challenge/constraints</u>	<u>Key solutions /ideas</u>
Autonomy of Institution	The IGTR is set up as an autonomous society but is still to a large extent guided by Government policies. The decision making body -Governing Council meets once in a year on an average	Setting up one apex body under DC MSME to administer all Tool-Rooms would be examined while consolidating management issues for all 10 Tool-Rooms
Management Systems	Detailed analysis of machine capacity is needed to check capacity spent on rejections, rework, maintenance, excess operator efficiency, idle time etc. Post placement tracking of trainees is not undertaken MIS is implemented in stores, accounts, marketing & consultancy The implementation for purchase, production and training are in the pipeline.	Design of an integrated IT enabled Financial and Management Information System (FMIS) covering all functions is a required
Procurement System	IGTR follows General Financial Rules (GFR) calling for quotations and decision making guided by L 1 principle due to which suppliers tend to quote lower rates, sometimes compromising on quality	Rate contract system should be considered for raw materials. Development of a procurement manual would be beneficial
Networking with other institutions and alumni	There is no networking with other Tool-Rooms/institutions except GMs meetings which usually takes place once in a year. The Tool-Room does not leverage the network of its alumni to enhance its marketing	Networking with other Tool-Rooms under MoMSME, also at Heads of Departments level, would be useful. Again an IT enabled platform networking with alumni is essential
Incentive scheme	Incentive scheme is complex and puts ceiling on payment of incentive even when employees have earned it.	Simplifying the scheme so that every employee can understand it. Ceiling needs to be removed

Introduction

Background Information

Tool-Room is the backbone of industry as manufacturing excellence begins there. To create infrastructure in the area for promotion of small industries, Government of India set up ten Tool-Room across the country with state of the art equipment for design and manufacture of tools and for training of manpower in tool making and allied trades. Of these four were set up with the assistance of Government of Germany, three Government of Denmark, two under UNDP and one without any external assistance. These Tool-Rooms are set up as autonomous bodies, Government of India Societies, with DC MSME as the Chairman. MSME Indo-German Tool-Room at Aurangabad is one of the 10 Tool-Rooms and one of the four set up with German assistance. The Tool-Rooms are now operating for about 10 years after close of the agreements of external assistance. GIZ is supporting an evaluation study of 10 Tool-Rooms. M/s Grant Thornton Advisory Private Limited has been retained as consultants to carry out the Study. Tool-Rooms under the state Governments are outside the scope of this study.

Terms of Reference

Tasks entrusted to the consultants are 'As Is' reports of ten Tool-Rooms, their ranking , recommendations for improving performance and action plan for the same.

The consultant team has been tasked to analyse the existing strengths and weaknesses of the ten Tool-Rooms in terms of their management, finances, human resources, technology and infrastructure as part of the as is assessment of Tool-Rooms that includes the following:

- a. Institutional / organisational development study of the scheme consisting of political economy aspects involving actors, financial flows, management systems and inter-agency issues
- b. stakeholder feedback on existing Tool-Room services from MSMEs and relevant business associations
- c. stakeholder feedback on further requirements from Tool-Rooms by MSMEs and relevant business associations [a, b to be executed in form of a user feedback survey]
- d. training needs of Tool-Room personnel
- e. Comparison of services with similar private sector and German facilities.
- f. Best practices from comparable national institutions such as the Nettur Technical Training Foundation (NTTF), Bangalore, a private educational trust established with Swiss assistance.

Methodology

Data has been collected from secondary information on MSME Tool-Rooms and through a structured questionnaire, filled by the respective Tool-Rooms. Facilities of the Tool-Room were visited and a series of meetings and discussions took place with senior and middle management of

Tool-Room, local associations, suppliers, user MSMEs, large clients and state government agencies for assessment.¹

Functioning of the Tool-Room has been analysed and assessed. Recommendations are made for improving alignment of Tool-Room services to the strategic goals through optimum mix of different service and delivery approach, cost recovery and impact. Scope for improvement in procedures, governance, technology, human resource and networking are also indicated.

This report is, however, limited to AS_IS assessment and analysis of MSME Indo German Tool-Room Aurangabad. Recommendations are part of a separate consolidated report for 10 Tool-Rooms. Recommendations shall contain an activity time plan and cost estimates. Cost estimates would refer to requirements of additional equipment, infrastructure, staff restructuring, training etc. In addition, an institutional analysis framework that can be used by the Ministry in future will also be developed.

Structure of the report

Given below is a summary of how the report has been structured:

Chapter I – Organisation Profile: A brief description of IGTR Aurangabad.

Chapter II – Governance and Management Systems: This chapter assesses the autonomy of the Tool-Room, guidelines of the Ministry of MSME to it and the level of interaction between DC MSME and the IGTR.

Chapter III – Organisational Assessment: This chapter assesses the current services, physical and technological infrastructure, marketing, finance, management systems, human resource and its impact against the stated policy goals.

Chapter IV – Overview of local Business Environment: This chapter assesses the location of the Tool-Room and the market potential for it to expand its services. It also analyses the backward linkages with raw material and machinery suppliers.

Chapter V – Inclusive Growth underlined by Social Impact: This chapter analyses the impact made by IGTR in training, tooling and other services.

¹ Complete list of meetings and interviews is placed at Annexure I.

Chapter I

Organizational Profile

Government of India established the MSME Indo-German Tool-Room (IGTR) in Aurangabad with financial assistance from the Government of Germany which also provided services of experts in design and manufacture of tools during the project. State Government of Maharashtra provided land and financed building cost. Constitutionally it is a registered society administered by MoMSME, Government of India. Governing Council constituted by the Government has representatives of Government of India and State Government and from Industry. DC MSME is the Chairman of the Governing Council.

Table 1: IGTR Profile

1.	Project Background	Established under Indo-German Technical Co-operation, MSME Indo-German Tool-Room (IGTR), Aurangabad is a Common Facility Centre in the area of tooling and training for promotion of the small scale industrial units in Maharashtra and adjoining states. It started operations in 1990.											
2.	External Agency	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH											
3.	Funding Pattern (INR in crores)	<table><tr><td>GoI</td><td>GoG</td><td>GoM</td><td>Total</td></tr><tr><td>20.84</td><td>29.52</td><td>10.84</td><td>61.20</td></tr></table>				GoI	GoG	GoM	Total	20.84	29.52	10.84	61.20
GoI	GoG	GoM	Total										
20.84	29.52	10.84	61.20										
4.	Organisational Structure	Government of India Society – An autonomous body under MoMSME, DC MSME											
5.	Objectives	To primarily assist small scale enterprises by: • Providing consultancy for effective use of tools, jigs, fixtures & gauges and guidance regarding their procurement and / or manufacturing. • Design and manufacture of tools, jigs, fixtures, moulds, dies and gauges based on in-house design or customers’ design. • Carrying machining jobs for tool parts for commercial tool-rooms and providing services related thereto. • Conducting long term training courses in tool and die making and allied trades. • Conducting short term training courses for entrepreneurs and employees of MSMEs											

6.	Technology	Following technologies are available at IGTR for tooling, production, training and rapid prototyping: - Production facilities; CNC milling machines, CNC lathes, CNC wire cut machines, jig boring machine, surface and cylindrical grinding machines. Range: Maximum weight 7000 kg and accuracy 5 microns - Quality control equipment: CMM 700X900X500, accuracy 1.5+L/350 microns - CAD/CAM hardware & software, including simulation software - Heat Treatment equipment, includes vacuum type (CMM, CNC machines and CAD/CAM workstations on LAN)
7.	Production range	- Tools: Moulds for plastics, die casting dies, press tools, Jigs, fixtures and gauges - Job work
8.	Training Programmes	a. Long Term Courses (One year or more duration) - Advance Diploma Course in Tool & Die Technology. Duration: 4 years. This course is approved by AICTE and Maharashtra State Board of Technical Education. - PG Diploma in Tool Design & CAD/CAM.. Duration 18 months - Two Post Diploma Courses in Tool Design and manufacturing. Duration:12 months - Six certificate courses in tool making, tool design, CNC machining and machine maintenance. Duration: 12 months b. Short Term Courses (Less than one year) The short-term courses address various topics in the field of Tool Engineering, CNC programming & machining as well as CAD/CAM for personnel from industry and engineering students which bridges the gap between educational institutions and the industry.

Chapter II

Governance and Management Systems

This chapter assesses the autonomy given to the General Manager of the Tool-Room, guide lines of Ministry of MSME and the level of interaction between DC MSME and the Tool-Room. This also assesses the role of GC in the functioning of the Tool-Room. This is also to analyse how all these factors are contributing to the performance of IGTR.

Policy Goals and Direction

Aim of setting up the project is to assist industry, primarily small scale industries and strive for self-sustainability. Tool-Room policy is directed in that direction. As a result of policy orientation, IGTR has performed well in fulfilment of its objectives to assist MSMEs and on training front, Tool-Room provides consultancy to MSMEs and the number units so assisted is also monitored towards promotion of MSMEs. It would add value to this monitoring if value of assistance is also tracked. Parameters to be tracked could be value of tools and other assistance rendered, increase in productivity, decrease in rejection percentage, saving in costs etc. on account of the consultancy provided to the industrial units.

Autonomy of Institution

The IGTR is set up as an autonomous society but it is still, to a large extent, guided by Government policies and in some cases even by Government rules and regulations. The decision making body - Governing Council meets once in a year on an average and it generally coincides with the Annual General Meetings convened for approving the annual accounts and annual reports. Decisions within its powers therefore have to wait or are taken and got post-approved by the Council. Now when IGTR has made full cost recovery including depreciation, like a private Tool-Room, local management should be given more autonomy, akin to the autonomy of a private Tool Room.

Suggestion has emerged during meeting with DC MSME and with stake-holders at IGTR that one central apex body under DC MSME to administer all Tool-Rooms would improve governance and networking. This would be examined while consolidating management issues for all 10 Tool-Rooms.

Characteristics of Core Management Team

Core management team at IGTR is well knit and motivated under a good leadership of the General Manager. This is the result of policies pursued by the Management. Departments are headed by Senior Managers or Managers who have the needed command. With responsibility, requisite authority is vested which builds team spirit. An incentive scheme is in place. Career development is taken care of and skill & knowledge development programmes are organised for employees. Team motivation is reflected in good performance of the Tool-Room.

Annual Targets

Yearly targets are fixed for revenue from production related services and training programmes. For training target is also fixed for the number of trainees trained in short-term and long –term courses. Monitoring of performance is done by the office of DC MSME. However, there has been no assessment of the market opportunity for services of IGTR. Targets are not linked to the market opportunity or desired level of impact.

Table 2 shows the targets and achievements in 2010-11.

Table 2: Annual Targets and Performance

Service	Target	Achievement	Achievement
Persons trained in long term courses	1220	1234	101 %
Persons trained in short term courses	2780	3200	115 %
Revenue in Training, INR in lakhs	625.00	610.62	98 %
Revenue in Production INR in lakhs	785.00	838.15	107 %
Interest and income	50.00	64.31	129%
Total Income	1460.00	1513.08	104%

Source: Action Plan report of IGTR

During the last five years, value of services rendered to MSMEs has increased from 58.33% in 2006-07 to 73.2 % in 2010-11. Some work for large scale units and export products is desirable as work for them is more challenging and improves expertise in design and manufacturing. On training side, during three years, number of trainees in long-term and short-term courses has gone up from 260 to 556 and 567 to 3401, respectively. This marks increase of 114 % and 512% intake of trainees in long-term and short-term courses, respectively.

There is need to monitor the following targets to track of the impact towards stated objectives

- Number of MSMEs assisted in terms of tooling and other production services.
- Number of consultancies to MSMEs to improve productivity, product design
- Value and impact of consultancy to MSMEs.

Management System

The IGTR is an ISO 9001–2008 certified organisation. There are Standard Operating Procedures (SoPs) covering the following areas:

1. Quality procedures
2. Design of training courses
3. Marketing
4. Cost estimation
5. Order processing from receipt o despatch
6. Production planning and control
7. Machine utilisation
8. Feedback from users
9. Customer satisfaction
10. Evaluation of training programmes

The SOPs are being followed. No non-conformity reported during audit in 2009. In 2010, only some minor non-conformity was found which was effectively closed during the period of audit itself. Data generated is integrated, analysed and reviewed by management.

Procurement system

Limited range of tool steels is available locally. Suppliers in Mumbai, Pune and Nasik are accessible who can supply tool steel from reputed manufacturers from all over the world. IGTR needs to follow the procurement guidelines laid down in the General Financial Rules (GFR) calling for quotations and decision-making guided by L 1 principle due to which suppliers tend to quote lower rates, sometimes compromising on quality and procurement procedures tends to be lengthy. But IGTR is able to overcome these by detailed description (specifications) of their requirement through expeditious actions so that materials are in position by the time tool design is completed which takes two to three weeks. Infact while procuring medium size to large size tooling projects, above 50 lacs to one crore, the quotations are also compared with Taiwan and China.

Besides, feasibility of rate contracts should be also be examined. For capital goods, an action plan with details of equipments and related costs is prepared in consultation with local GC members and submitted to DC-MSME at the beginning of FY for in consultation with Integrated Finance Wing of the MoMSME. It is then ratified by the Governing Council. However, there are instances, when request for funds is submitted Integrated Finance Wing sometime raises objection although it had been concurred by them before. Procedure needs to be simplified and if Integrated Finance has agreed before they should not object at the advanced stage. Since the capital goods are also procured on least cost basis, two bid systems should be used. It may be advisable to seek performance bank guarantee from the supplier for a limited period to ensure desired performance of plant and machinery.

Development of a procurement manual covering the operational details on above suggestions would be beneficial to improve efficiency and effectiveness of procurement.

Networking with other Tool Rooms, institutions and alumni

The IGTR can significantly improve networking with alumni which can lead to more business and placements as many ex-trainees eventually occupy decision making positions for tool planning and training in the industry. At present net-working with other Tool-Rooms is through yearly meetings of General Managers of Tool-Rooms. To share experiences such meetings at levels of Heads of the Departments should also be started.

Interaction with DC MSME

DC MSME monitors the performance of Tool-Room. System is in place under which Tool Room submits the following reports:

a) Performance report, submitted monthly. Against annual targets, following information is submitted for the month and cumulative during the year up to the month of report.

Revenue, expenditure, order position, delivery status, machine utilization, number of trainees and number of MSMEs assisted. Tool Room is required to explain the short falls, if any.

System brings out cost recoveries but not the impact and outreach to MSMEs. Instead of monitoring numbers it should bring out the value of assistance provided to MSMEs and highlights of the best 5 technology related assistance cases. System should also be evolved to monitor customer and trainee feed backs of courses conducted.

b) Annual action plan containing targets and funds needed during the year for recurring and non-recurring expenditure. It is prepared in consultation with local members and submitted to DC MSME who approves the same in consultation with Integrated Finance Wing of the Ministry. It is

then put to Governing Council for ratification. Role of Governing Council is limited to local members who are consulted. Ratification is a formality.

- c) Monthly status of courts cases in which DC MSME is respondent.
- d) Annual Report which includes audited annual accounts for placement before the Parliament.
- e) Information on innovative work done. This is used for preparation of Cabinet Note on performance of MoMSME.
- f) Annual manpower status.

Decision Making

Management of the Tool Room is with the Governing Council. However it meets once in a year, on an average, when convened to pass Annual Accounts and Annual Report. These meetings are generally held away from the Tool Room premises. Also representatives of industry are not found to be taking interest in decision making and it is generally the officials from MoMSME and state Govt. who deliberate in the meetings. Members other than officials are volunteers. It is needed that the structure is revised in favour of greater percentage of independent members with no personal or professional relation with Tool Room e.g. representatives from universities and technology leaders. They should be paid honorarium for their services.

While expectations from CTTC are similar to those from a private commercial Tool Room, it is not allowed a similar level of independence. As the Tool Room performing better, recovering full costs including depreciation, it should have greater autonomy of a private Tool Room.

Chapter III

Organisational Assessment

This chapter assesses the service portfolio, technological infrastructure, marketing strategy, finance, management systems, human resources and its impact against the stated policy goals. This chapter also analyses factors contributing to or hindering the performance of IGTR Aurangabad in achieving its stated objectives and policy goals of “enhancing competitiveness of manufacturing MSMEs through tooling services and availability of skilled manpower”.

Overview of Services

The following services are currently being offered by the IGTR:

Table 3: Service Mix of IGTR Aurangabad

Production		Training ²
Tools	Job work	
• Design and development • Manufacturing of Tools: -Moulds -Press tools -Die Casting Dies - Jigs, Fixtures -Gauges. • Trials of Tools • Repair of Tools • Inspection of Tools • Modification of Tools • Outsourcing its tools- for machining purpose to the MSMEs helping to upgrade their technical capabilities	• Common facilities in precision CNC machining operations • Common facilities in precision conventional machining operations • Inspection • Reverse Engineering • Components • Standard Parts	• Advanced Diploma in Tool and Die making Duration: 4 years • Certificate Course in Machinist (Tool-Room) Duration: 2 years • PG Diploma. in Tool Design Duration: 18 months • Eight Courses in tool related disciplines & CAD/CAM Duration:1 year • 30 short term courses of 48 hours to 3 month duration in tool related discipline & CAD/CAM • Short-term courses for engineering students • Tailor made special training courses for industrial houses and under skill development

² List of long term and short term courses conducted by IGTR is in Annexure II

Production		Training ²
Tools	Job work	
		programmes of central and State Governments.
In addition to the above IGTR also provides consultancy and mentoring support to MSMEs to improve productivity by use of better tools and / or better production processes		

The following tailor-made special training programmes were conducted during 2010-11 by IGTR:

Private Industry	:16
MSME DI New Delhi	:10
Ministry of Development of NE Region, GoI	:11
State Governments	: 3
Govt. of South Africa	: 4

Table 4 below indicates the cluster served by IGTR.

Table 4: Production related services - Sector Mix

Type of tools/ services	Industry Sectors				
	Plastic/ Rubber	Auto Components	Home Appliances	Irrigation Equipment	Others
Moulds	√	√		√	√
Dies		√		√	√
Jigs, fixtures	√	√	√		
Gauges	√	√	√		
Job work	√	√			
Training	√	√	√		√

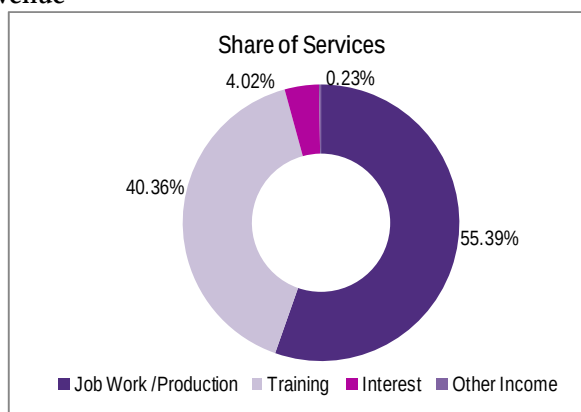
Contribution

The break-up of revenue contribution from various services in 2010-2011 is given in the table below:

Table 5: Break-up of Revenue Contribution

Services	Contribution
Job Work /Production	838.15
Training	610.62
Interest	60.80
Other Income	3.51
Total	1513.08

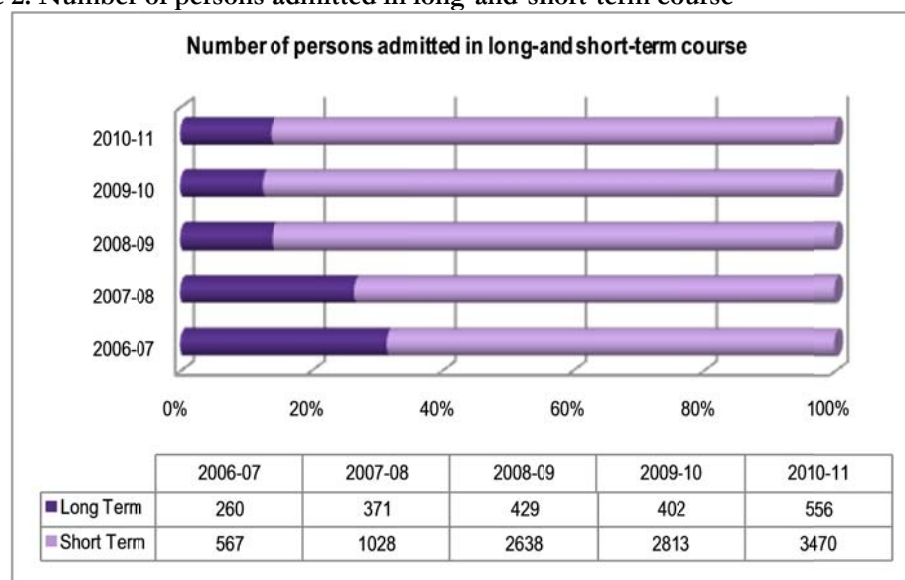
Figure 1: Share of revenue



Training

IGTR Aurangabad enjoys strong reputation in training. There is good demand for training courses. During 2010-11 4026 persons were trained. Trainees in short term courses have increased in higher proportion than in long term courses. Pattern is shown in Figure 2.

Figure 2: Number of persons admitted in long-and-short-term course

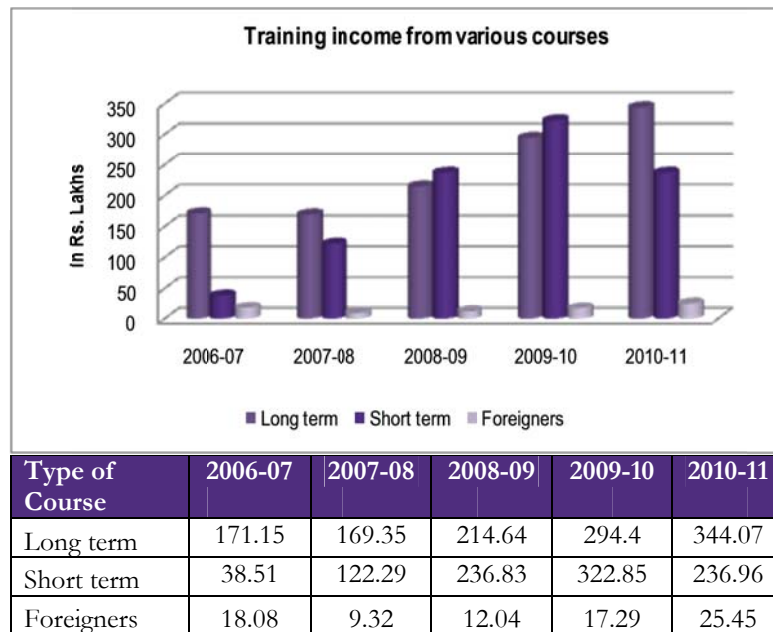


Revenue generation per employee is better in training in comparison to production. With 20 % employees, training is generating 40% of the total revenue. There is a change in awareness of industry for skill development. Industrial units depute employees to improve their skills. A number of fee concessions and scholarships are available and so are the Govt. sponsored skill development programmes where fees are paid by the Governments. Sources of flow of fees in 2010-11 are shown in Table 6 and income trends of long and short term training are in Figure 3.

Table 6: Sources of training fees

Sl. No.	Fees paid / reimbursed by	Amount, Rs. in lakhs
1	Maharashtra State Board of Technical Education	3.81
2	DC MSME, MoMSME, Government of India	156.30
3	Ministry of Development of North-East Region, Govt. of India	65.03
4	Madhya Pradesh Council of Employment and Training	19.45
5	Private companies	13.68
6	Foreign Governments, development agencies	25.45
7	Trainees	322.77
8	Miscellaneous	4.13
Total		610.62

Figure 3: Training Income from various courses



While payment of fees by Government agencies is welcome for skill development, Tool-Room has to be cautious. If, due to change of policy, Government stops financing fees in these training courses, it could become difficult for IGTR to fill the gap at a short notice.

General Manager IGTR is aware of the necessity to have a balanced mix. He guides his team to aim at a balance of income from training and production so that each contributes equally to the revenue. In production, the aim is to have share of tooling to at least 50%. Likewise in training, on an average, 50% payment of fees should be from the trainees themselves. This is an excellent policy and could be a benchmark for other Tool-Rooms.

Placements

Placement record is an indicator of reputation of a training institute. It is arranged for long –term trainees. Short-term trainees are from industry or colleges and polytechnics that go back to these institutions. Many long term trainees go for higher studies, like degree in engineering and do ask for placement. A few come on their own need and ask for placement. IGTR has a good record of placement in this respect. Out of 2195 long trainees who asked for placement during the period

from 2006-07 to 2010-11, 1919 were placed in campus interviews and 40 were assisted to set up their own units.

Post Placement Tracking

While initial information on position of engagement of passing out trainees is obtained there is no system of post-placement tracking of candidates. Net-working with them will be useful, a good leverage by the alumni for marketing of Tool-Room services.

Pricing of Services

Tooling and Job Work

The pricing for any tooling job and production/job work is calculated on the following formula:

Cost = ($\sum$ Machine hour rates X Number of hours on machines/cost centres) + cost of raw materials.

Machine hour rates are calculated taking into account the following components:

- Depreciation
- Direct labour
- Indirect labour
- Costs of utilities like electricity and other consumables
- Consumables
- Factory overheads
- Administrative overheads
- Margin

Machine hour rates are fixed keeping the rates calculated as above and rates offered by other commercial Tool-Room. Rates were last revised in 2009-10. These are being reviewed in 2011-12. Quotations are prepared on the basis of cost of raw materials and cost of machining and a margin to cover rejections and rework.

Of the three factors important to industry for tooling, users find IGTR quality to be very good, delivery acceptable but prices high, especially for micro and small units. IGTR delivers tools in 9 to 11 weeks which is the industry norm. Discounts upto 20% are allowed to MSMEs.

In order to serve MSMEs more effectively with reasonable cost, IGTR has balanced high value/precision machines with moderate value, medium accuracy machines in order to accommodate a variety of jobs. This aids in keeping machine hour rates reasonably competitive. Besides, IGTR also uses training resources for medium/wider accuracy jobs to assist MSMEs with competitive machine hour rates.

However, there are several external factors that affect Tool Room performance based on machine hour rate:

- Though the Tool Room makes constant efforts to improve effectiveness in machine utilisation, the factors like skewed man to machine ratio, lack of manpower etc. effect the performance and therefore, such comparison with commercial tool rooms might not be justifiable
- Each tool room works in different market conditions and prevalent machine hour rates in the region also influences the Machine Hour Rates

Training

The cost for each training programme is estimated at the time of commencement of the particular programme based on machine hour rates, time it would take at various cost centres and costs of utilities. Long-term courses are subsidised and fees decided once in a year by the Governing Council. For short-term courses margins are added over and above the estimated costs. On completion of short term courses, comparison of actual costs with costs calculated at the time of launching of the course is done and reviewed by the Management Team for future corrective actions as might be needed.

Marketing -

System

The IGTR has a separate Consultancy and Marketing Department. It has a marketing team comprising a Sr. Engineer and an Engineer. Senior Manager Production has, currently, over-all control of this department. Training courses are marketed by the Training Department. Each team is given annual targets which are approved by the Governing Council and DC MSME. Monthly progress review is carried out by General Manager.

Strategy

One-on-one meetings are held with representatives of users at IGTR and also through visits to regular and prospective customers. Tooling requirements are discussed in detail and after all technical clarifications prices are quoted and commercial clarifications given, if needed. An advance of 40% is taken along with the order as security since tools are customer specific. IGTR also participates in exhibitions at national level, such as IMTEX, Maha Vend etc. and local exhibitions. Advertisement is inserted in newspapers and in TAGMA news-letter. Online marketing through email and website³, for production services is also attempted although with limited success. For training networking with engineering colleges is additionally done. IGTR is reputed for quality products and covers a wide range. Many customers, therefore, visit IGTR on their own with requirement of the tooling and other services needed by them.

Constraints:

Organised and systematic need assessment of the market available to IGTR and its segmentation, for IGTR, has not been done. Such a study is required to give IGTR a leverage to en-cash the expertise developed by it and the reputation it has gained.

Client Profile

Product spread of IGTR from 2006-07 to 2010-11 is given in Table 7.

Table 7: Spread of tools produced from 2006-7 to 2010-11

Type of Tools or Job Work	Press Tools	Die Casting Dies	Moulds for Plastics	Jigs, Fixtures, Gauges	Job Work
Percentage share, based on values	28.30%	42.70%	11.68%	2.14%	15.78%

Given the profile of industry in Maharashtra, the maximum demand of tooling would come to IGTR from automobile and auto component industry for moulds, press tools, die casting dies, jigs, fixtures, gauges etc. The IGTR has developed expertise in press tools and die casting dies. According to TAGMA study, these two categories of tools together form 49 percent of the tooling

³ www.IGTRAurangabad.com

demand in the country. Also these are needed by auto component industry which is poised to grow at the CAGR of 21% during the next five years. IGTR's proximity to such industrial clusters in Aurangabad and Pune gives it a great edge in marketing.

Types of Industries Served – MSMEs assisted

IGTR has done well in generating revenue and cost recovery. It has done equally well in assisting MSMEs whose share in services rendered by IGTR has been consistently good. It has steadily increased from 58.33% to 73.20% in last five years. Actual data is given in Table 8.

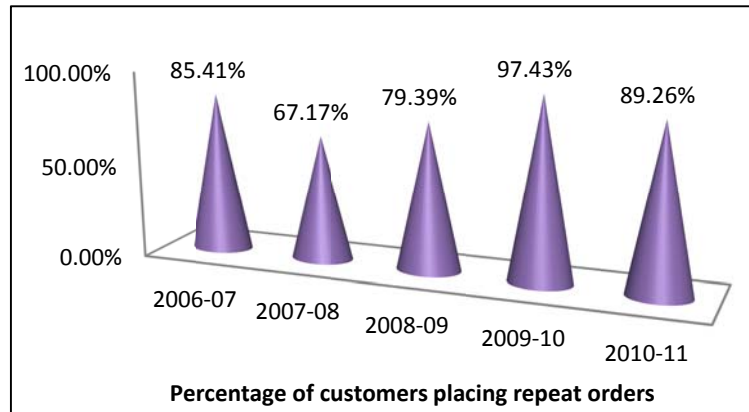
Table 8: Industry Break-up of revenue

Type of Industry	2006-07	2007-08	2008-09	2009-10	2010-11
MSMEs	58.33%	58.73%	63.01%	69.35%	73.20%
Large-scale	40.00%	39.68%	35.62%	30.65%	25.77%
Exporters	1.67%	1.59%	1.37%	0.00%	1.03%
Total	100.00%	100.00%	100.00%	100.00%	100.00%

Customer retention

IGTR scores well in customer satisfaction and thus retention. 89.26% of the orders received during 2010-11 were from repeat customers. Trend during the last 5 years is reflected in Figure 4.

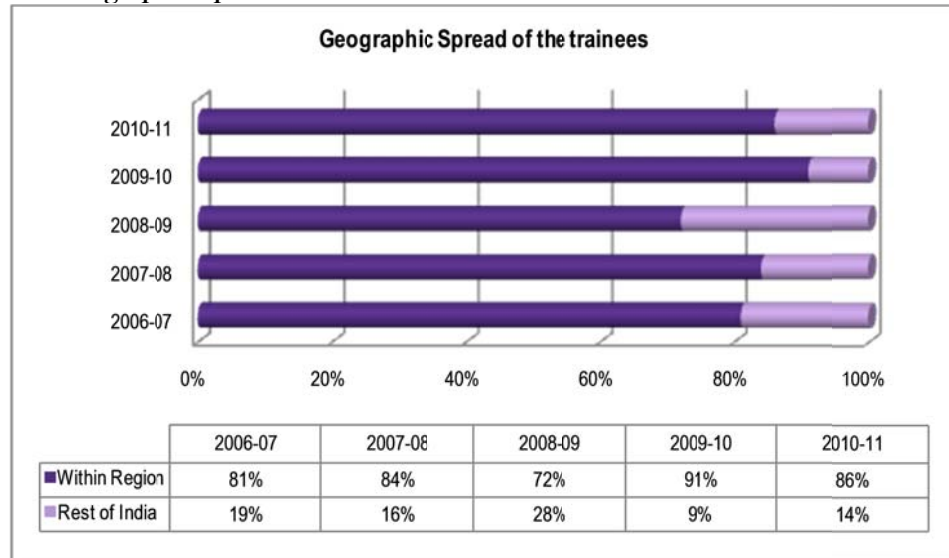
Figure 4: Repeat Orders



Geographic Spread of tooling services

IGTR is en-cashing on its reputation for quality products. It does not have to go far to sell its products, majority of these are going to assist the industry of the region which is a plus point as it is serving the region for which it was set up. Trend is shown in Figure 5.

Figure 5: Geographic Spread of trainees



Physical and Technical Infrastructure

Physical Infrastructure

The IGTR is a well equipped public commercial Tool-Room in the Western Region. It is located in the industrial area developed by Maharashtra Industrial Development Corporation in Chikalthana in Aurangabad. The total built up area of IGTR is 13324 square meters. The built up area for the various departments is given below:

Table 9: Building Areas

Facility	Area in Square Meters
Production Services(Workshops + Quality Control + Labs, Design & Development)	4669
Marketing, Administration, Accounts HRD	1708
Training excluding hostel	4276
Hostel	2534
Others	137
Total	13324

The following expansions are planned for the next three years:

- Hostel for Boys, capacity 40
- First Floor for class rooms above Training Department
- Extension of building at Nagpur Extension Centre
- New building for Pune Extension Centre

Utilities

IGTR has an electrical sub-station, an air conditioning plant, submersible pump and tank for water supply. IGTR has power back up which can feed all the critical equipment in case of power cut by State Electricity Board. Capacity is given in Table 10.

Table 10: Power-Back up

Capacity	Flexibility for use
Connected Load from State Electricity Board	650 KVA
Power Back UP	Two DG sets of 300 and 200 KVA capacity. The system is flexible. It can feed all important machines on priority basis, as selected by the Management.

Equipment in production-related Services Sections

Under Indo-German Technical Co-operation Programme, IGTR was equipped with high-tech equipment needed at that time. Subsequently, the plant and machinery has been augmented and upgraded from time to time. It now has all typical Tool-Room equipment of a modern Tool-Room, like:

- CNC Wirecut, Agie Charmillies, FL 440 CCS, accuracy ± 0.001 mm per 300 mm
- CNC Milling, She Hong Industrial Corporation, weight carrying capacity: 7000kg, accuracy: ± 0.005 mm per 300 mm
- Vertical Lathe, Hono Seiki VL-100C, weight carrying capacity: 3500kg, accuracy: 0.015 mm
- Horizontal Lathe, DMG CTX 400, accuracy: ± 0.005 mm
- Surface and cylindrical grinders
- CAD/CAM work stations
- CAM software: ungraphics, Mastercam, Delccam
- CAD software: Solid works, ProE, Catia, Unigraphics, Mastercm, AutoCAD, Delcam

CMM, CAD/CAM and CNC machines are on LAN which facilitates reverse engineering.⁴

Appropriateness of Technology in Production related Services Sections

The available equipment at IGTR has the capacity to meet majority demands with respect to accuracy, complexity and physical size of tools. It has capacity to machine a 7000 kg, 2100X1500X800 mm tool part /work piece in CNC milling. In CNC wire cut, it can handle a tool part weighing 1500 kg to an accuracy of ± 0.001 which gives it an edge to manufacture large size press tools of which there is market from auto component industry.

The Design department plays an important role in the success of a Tool-Room. Its services include product design and tool design before the tools are taken up for production. Given the nature of MSMEs, this is a major area of strength of IGTR. The MSMEs typically come with the component expecting the Tool-Room to prepare the tool design to produce that component. One of the key constraints to serve small scale industries through design services is that the latter often prefer low cost tooling and therefore, go for non-standard tooling while IGTR designs and manufactures tooling with specific quality standards and costs. Besides, without design skills it is difficult to service such MSMEs which are considerable in number. However, Design Office has simulation software and personnel to use it for the following advantages:

- Percentage of tools successful in first trials tends to improve
- Time and labour spent on rework or remake of rejected or defective parts is reduced.
- Delivery times are reduced.

⁴ List of important and high value machines is in Annexure III.

Equipment in the Training Department

Training Department at IGTR is again well equipped. Equipment includes conventional machines as well as CNC machines of a general engineering workshop. The department also has typical Tool Room equipment like:

- CNC Wire EDM Machines
- CNC EDM Machine
- CNC Milling Machine
- CNC Lathe
- CNC Co-ordinate Measuring Machine
- CAD/CAM work stations
- CAM SOFTWARE: UNGRAPHICS, MASTERCAM, DELCCAM, MTS, EMCO
- CAD SOFTWARE: SOLID WORKS, PROE, CATIA, UNIGRAPHICS, MASTERCAM, AUTOCAD, DELCAM
- CAE SOFTWARE: ANSYS, HYPERWORKS, NASTRAN, MOLDFLO

Equipment in Training Department is commensurate with current training needs of the Industry.

Expansion Plans

The Tool-Room has planned huge expansion facilities, both horizontally and vertically, in 2011-12. An action plan of Rs.17 crores has been approved by DC MSME. Government of India will fund the plan to the extent of Rs.5.85 crores. Balance has to come from IGTR's own savings (accumulations of surplus of income over expenditure) and loan to be raised by it. A Tool-Room funding capital equipment without Government grants, to a large extent, is a positive sign and perhaps is happening in the Tool-Room family for the first time (Tool-Room in Bhubaneswar is , simultaneously, going for similar action plan). With this expansion IGTR will upgrade its operations from 3-axes to 5-axes machining and scanning in Co-ordinate Measuring Machine from mechanical to laser. Pay period of the various machines being procured under the expansion plan is from 4 to 6 years. The plan is commendable and should be supported all around.

Human Resources

Strength of employees in IGTR is 91. Additional persons are hired on contract as and when needed to keep the expenses low. It also provides operational flexibility. In addition to the General Manager who is the Chief Executive, IGTR has the following personnel:

Table 11: Personnel

Department	Senior Manager	Manager	Sr. Engineer	Foreman/ Engineer*	Technician	Others
Administration		1		3		7
Marketing			1	2		1
Design& QC		1	2	9		1
Production#	1	1	2	7	34	4
Training		1	1	5		5
Sub-Total	1	4	7	26	34	18
Total	90 (91 including General Manager)					

*Includes Officers in Administration & Accounts at similar level # Includes Maintenance

Vacancies and requirement

Sanctioned strength is 161 while only 91 personnel are occupying different positions. Remaining posts are kept vacant as the present strength is commensurate with the level of activity. Additional workforce is taken on contract or casual basis as and when needed. This approach is commendable as it gives flexibility to management and keeps the costs low. Vacant posts, even those vacant for a long time, are not surrendered for understandable reasons. It is easy to surrender posts but difficult for IGTR to get new posts sanctioned when needed. Cushion is, thus, available for future expansions.

Skill up gradation /capacity building

Skill and knowledge development programmes are needed for existing employees. Apart from acquiring new skills and knowledge, such programmes enhance employees' motivation. IGTR management organises training and skill development programmes as a regular feature.⁵

Retention

Good HRD policies keep the employees with IGTR for a reasonable period. The retention pattern is reflected in the Table 12.

Table 12: Retention Pattern

	Number of years at IGTR Aurangabad			
	Above 16	11 to 16	6 to 11	Less than 6
Number of Employees	30	25	6	30

On the other side, 22 employees have resigned during the last 5 years for better prospects elsewhere. Those were engineers and technicians. This is not to be taken as a negative point. IGTR experience is spreading to Industry which can be a marketing leverage.

Incentive System

Tool-Rooms under DC MSME have been allowed to adopt incentive schemes based on the overall guidelines and limits decided centrally by DC MSME. This is a group incentive scheme and does not take into account individual performance. The scheme lays stress on increasing generation of surplus of income over expenditure 25 % of which is allowed to be distributed to the employees. There are restrictions on maximum amount payable, 3 month salary if a Tool-Room has recovered cost without depreciation and 4 month salary if it has recovered cost including depreciation. Distribution is further based on the following factors:

- Salary = Basic Pay + Grade Pay + Dearness Allowance subject to maximum sealing on basic pay of Rs.8560/- ; those with basic pay of more than Rs.8560/- are paid incentive based on Rs.8560/- basic pay (revised after implementation of 6th Pay Commission Recommendations)
- Number of days of attendance in the financial year over the Tool Room working days.
- There is a maximum sealing on payment of four months of Basic Pay + Grade Pay + Dearness Allowance subject to maximum sealing on basic pay of Rs.8560/-
- Contractual employees are also paid incentive based on the number of days they have worked and their wages.
- Ad-hoc and contractual employees are also covered, but at a different (Lower) scale.

⁵ List of training programmes organised recently is given in Annexure IV.

IGTR has introduced incentive scheme based on above guidelines. This has motivated all sections of employees which is the force behind improvement in output at IGTR. For the year 2009-10, a sum of Rs.34.36 was paid in the next year financial 2010-2011. In 2010-11 Tool-Room has done even better. It has recovered full costs including depreciation. The restriction, therefore, stands raised to 4 months' salary, to employees' advantage. Tool-Room work is non-repetitive. Routing and scheduling differ with every tool part. Individual incentive scheme, although more effective, is difficult until a high level FMIS is developed. This needs to be examined

Operational Efficiency

Lead Time and Quality

IGTR Aurangabad is known for the quality of its tooling and other production work. Delivery of average tool is from 9 to 11 weeks. This is as per Industry norm and is acceptable to the industry. Associations and industrialists using IGTR also find the price level reasonable except in case of micro and small units which still find the price high and unaffordable

Machine Utilisation

Tool-Room machines are expensive. Industry norm (Commercial Tool-Rooms included) is, to use such expensive machines and equipment round the clock except on closed holidays (some units even run on these closed holidays by rotating employees). Absenteeism and leave periods are covered by re-deployment. Except for setting up, an operator can operate more than one CNC machine. Since tool-room operations are non-repetitive and all tool parts need different routing and scheduling, 100% of this capacity cannot be utilised, the aim should be to achieve 85% utilisation of this. IGTR Aurangabad has substantially improved its operation. However there is scope to go further in use of expensive machines and equipment in production related activities.

With above observation in view, utilisation data for 15 critical machines and high value machines at IGTR in production related services was examined. Out of these two are installed in 2011 and excluded for these calculations. Two Co-ordinate Measuring Machines are for inspection, which as per industry norms, are not engaged round the clock. These have been taken on single shift basis. Data for 11 machines and 2 CMMs was analysed for utilisation. Ideally, and as per Industry norm critical machines should be used round the clock. IGTR's position is as below:

Table 13: Machine Utilisation

Description	Number of hours
Installed capacity as per Industry norm ⁶	83980
Number of hours attended	39405
Utilisation of the machines	47%
Idle hours	5723
Maintenance hours	4438

⁶ Calculation of installed capacity:

Days in a year	=	365
(Less) Sundays	=	(52)
Holidays	=	(17)
Net working days	=	296
Number of Hours on 24x7 basis (296*24)	=	7204
per machine		
Number of hours for 11 m/cs	=	7204*11
Number of hours for 2 CMMs	=	8*296*2
Total Number of hours	=	83980

%age idle to attended hours	14.5%
%age of maintenance hours to attended hours	11.2 %

As highlighted in the table above, utilisation of installed capacity is low. Maintenance and idle hours are also high. IGTR can bring down their price by working in more shifts as that will spread the overheads more evenly, over more working hours. If only two shifts of 11 machines are considered for capacity, its utilisation is about 70%.

IGTR however reports capacity utilisation of 87.7 % for 11 machines, which is based on two shift working and further reducing the number of working days from 296 to 235 with attendance factor⁷ of 0.88 and efficiency factor⁸ of 0.90 ($296 \times 0.88 \times 0.90 = 234.43$, say 235). Also since attendance factor and efficiency factor are already taken into account, this is operational efficiency. CMMs being service machines are not included in these calculations.

There are several factors that impact effective machine utilisation:

- Total no. of 'A' Class & 'B' Class machines (excluding supporting machines) are 43 (out of which 26 machines are older than ten years) while the technicians engaged are only 27. Number of on the job trainees of 1 year duration are 35 – 40 whereas of 6 month duration are 55 -60. With a man to machine ratio of 1:3 and nearly 100 in-plant trainees, the machine maintenance is quite difficult task and therefore, the idle time projected for maintenance is quite optimum/realistic.
- Maintenance Dept. is functioning with only 1 Sr. Engineer, 1 Foreman and 2 Technicians with responsibility of preventive maintenance, for 30 A Class, 15 B Class, 18 C Class machines. This is in addition to 63 training machines and 15 CAD/CAM & Misc. Labs along with the utilities.
- In addition to it, IGTR is implementing TPM/autonomous maintenance that involves all the trainees and employees.

Financial Analysis

Grant Thornton obtained audited financial statements of the five financial years ending March 31, 2010 for Indo German Tool Room, Aurangabad. The analysis was done on the following parameters:

1. Net worth
2. Profitability and composition
3. Trend of income and expenditure

Net worth

The net worth of an enterprise is the sum of total equity and retained earnings. Net worth reflects the value of the enterprise, considering it is composed primarily of the money that has been invested in the enterprise since its inception, as well as the retained earnings for the duration of its operation.

⁷ Since employees are entitled to take 50 Leaves (EL-30,CL-8+RH-2+HPL-20), it means 17% ($50/296 \times 100$) of the man days may be consumed for leave. But for calculation purpose, only 12% is considered for attendance factor. Also, since 55 employees are working for more than 10-15 years, this results in accumulation of Earned Leave to the maximum limit.

⁸ Since man to machine ratio is 1:3 and additionally, technicians are required to train/guide the trainees along with actual work, this in turn impacts effective utilization. Considering this constraint, the efficiency factor of 0.9% is reasonably good.

Table 14: Net Worth with Government Grants

Particulars	2005 - 06	2006 - 07	2007 - 08	2008 - 09	2009 -10
Net worth	260,916,762	271,632,640	293,171,089	314,498,317	338,166,865
Year-on-year increase		4%	8%	7%	8%

The net worth of IGTR, Aurangabad has been increasing every year on an average of 7%, which is a healthy sign as it implies an increase in equity or value of the Tool Room. During the years the Tool-Room was also in receipt of Government grant. Following is the trend of government grants being received by IGTR, Aurangabad

Table 15: Government Grants

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10
Contribution from GOI	29,000,000	28,000,000	30,000,000	31,000,000	30,000,000

Net worth of the Tool-Room excluding the Government grants received is provided in the table below:

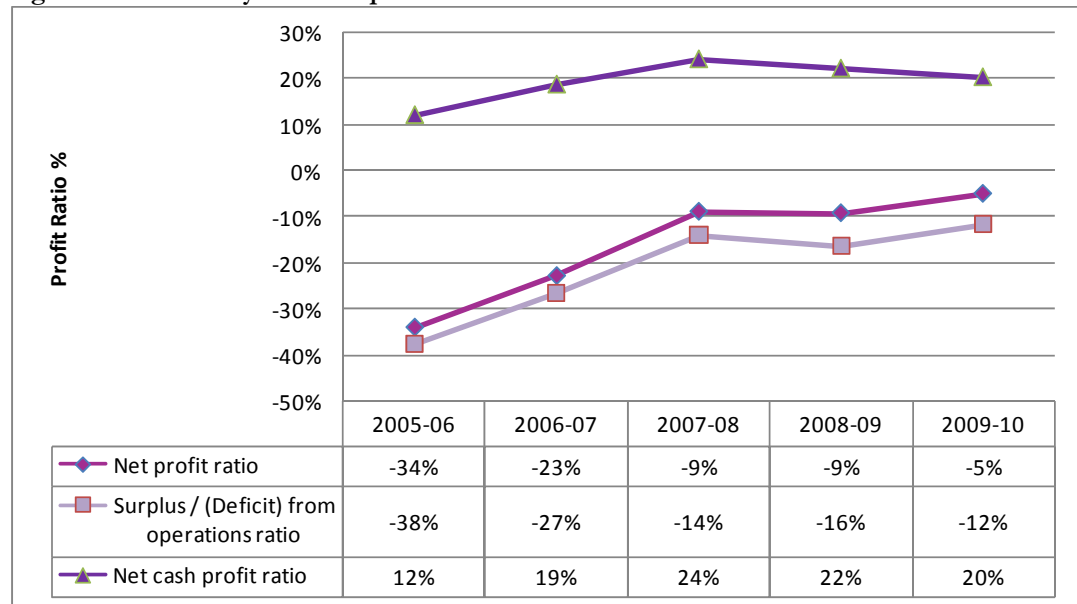
Table 16: Net Worth without Government Grants

Particulars	2005 - 06	2006 - 07	2007 - 08	2008 - 09	2009 -10
Net worth excluding government grants	231,916,762	243,632,640	263,171,089	283,498,317	308,166,865
Year-on-year increase		5%	8%	8%	9%

The Net worth of the tool room has been declining without Government grants. The revenues are not able to recover the costs and it is evident that the Tool -Room is in need of aid from the Government to sustain its operations.

Profitability and Composition

Figure 6: Profitability and Composition



The Tool-Room has been incurring a deficit from operations. The same reduced over the years from 38% in FY 2005-06 to 27% in FY 2006-07, 14% in FY 2007-08, 16% in FY 2008-09 and 12% in FY 2009-10.

Even after including other income, the deficit cannot be set off completely and the Tool-Room has a deficit even on an overall basis. However, the Tool-Room has been cash positive since FY 2006-07. The reason for the same is that depreciation is a non-cash expense and accounted for a major part of the total expense, averaging to 30% in five years from FY 2005-10.

In FY 2005-06, depreciation accounted for almost 34% of the total expenses. But over the years, the weight has shifted from depreciation to establishment expenses and the establishment expenses cost contributed to 37% of the total expenses in FY 2009-10. On the other hand, the share of depreciation towards the total expenses has gone down gradually to 34% in FY 2005-06, 30% in FY 2007-08 and finally to 24% in FY 2009-10.

The primary source of revenue for IGTR was income from sales and services and the same constituted 66% of total income in FY 2005-06. However, same has decreased to 44% in 2009-10. And income from fees and subscriptions increased from 34% in FY 2005-06 to 50% in FY 2009-10. Income from other sources constituted mainly of interest income which is very marginal as compared to total income and on an average is 4% of total income over last five years.

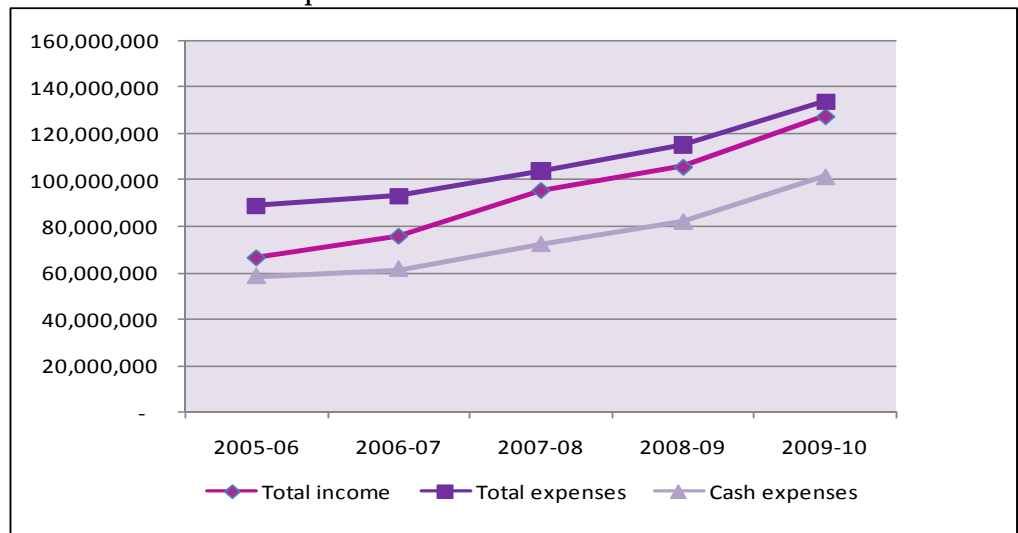
Trend of income and expenditure

Grant Thornton did a trend analysis of the income and expenditure of IGTR, Aurangabad based on the audited financial statements provided for the five years ending March 31, 2010. Given below is a diagram reflecting the relationship between the income, expenses and cash expenses:

Figure 7: Trend of income and expenditure

Particulars	2005 - 06	2006 - 07	2007 - 08	2008 - 09	2009 - 10
Total income	66,632,254	75,918,134	95,687,049	105,742,544	127,587,196
Total expenses	89,240,270	93,202,256	104,148,600	115,415,316	133,918,648
Cash expenses	58,564,027	61,683,350	72,473,913	82,203,392	101,616,418

Figure 8: Trend of income and expenditure



The Tool Room has been operating at a deficit as the expenses are in excess of income. However, the income is increasing at a faster rate of 18% compared to the expenses which are increasing at an average of 11%. Although operating in a deficit at an overall level, the Tool Room has still been generating a cash surplus since FY 2005-06 onwards and the surplus has been increasing every year. The same can be seen from widening of the gap between the total income and the cash expense lines in the diagram.

Chapter IV

Overview of local Business Environment from Tool-Room perspective

This chapter assesses the location of IGTR and the market potential for it to expand its services. It also analyses the availability of raw material and machinery suppliers in the region.

Location and Market Potential

MSME Indo-German Tool-Room is located in the industrial area at P-31, Maharashtra Industrial Development Corporation in Chikalthana, Aurangabad. The MSME Indo-German Tool-Room has a strategic advantage from its location in Aurangabad, the city and its nearby cities of Nasik, Pune. They have significant concentration of industries which are heavy users of press tools and forging dies expertise for which is a USP of the Tool-Room. These users are Automobile and Auto Component industries which are projected to grow at CAGR of 21 %. Tooling demand will grow accordingly. Backward linkages with raw materials suppliers and machine suppliers are in Table 17.

Table 17: Backward Linkages

Input	Linkage/ Sources
Raw Materials	Limited stockists in Aurangabad. Main stockists are based in Pune, Nasik and Mumbai. Agents and importers for imported tool steels are located in Mumbai and Chennai
Machine Tools	Manufacturers for indigenous machines. Direct imports for imported machines, nearly all such suppliers have agents in India for liaison and service back up. Some imported machines are also available in rupee payment in India from agents
Standard Moulds and Die sets	Manufacturers or stockists, mostly outside Aurangabad and some complex parts like hot tubes for hot runners etc are imported.
Cutting Tools	Manufacturers and stockists sufficiently present in Aurangabad
Consumables like oils, greases, salts	Stockists in Aurangabad
Spares	From OEMs except for standard spares like bearings
Specialised Maintenance/Service of CNC Machines	By the machinery suppliers. In case of imported machines, this is provided by agents of the foreign suppliers through annual Maintenance Contracts which tend to be expensive or on visit basis which is preferred by IGTR. Service agents are based at the headquarters of the agent and arranged on need basis. Agents of a few foreign principals/suppliers have their branch offices or liaison offices in Aurangabad which is an advantage for close liaison with service engineers and cuts down time for attending to the break down

Growth and Presence of Private commercial Tool Rooms

Private Tool-Rooms are coming up in and around Aurangabad. Some of the ex-trainees of IGTR have taken the initiative of setting up their own business in tool making and machining of parts. Most of the commercial Tool-Rooms are small and specialise in specific area. While private tool-rooms have flexibility in decision making like procurement of raw materials, consumables and equipment, they lack modern technologies like advanced CNC machining. Government tool-rooms cannot meet the gap between demand and supply of tools but they can act as a facilitator and encourage private commercial Tool-Rooms to expand their operations by using common facilities at IGTR should support them in the following areas:

- Design and development of products and tools
- Developments of prototypes
- Making tool parts for which commercial Tool-Rooms do not have the facilities
- Assistance in programming of CNC machines to the extent available with these Tool-Rooms
- Assistance in selection of new equipment

Chapter V

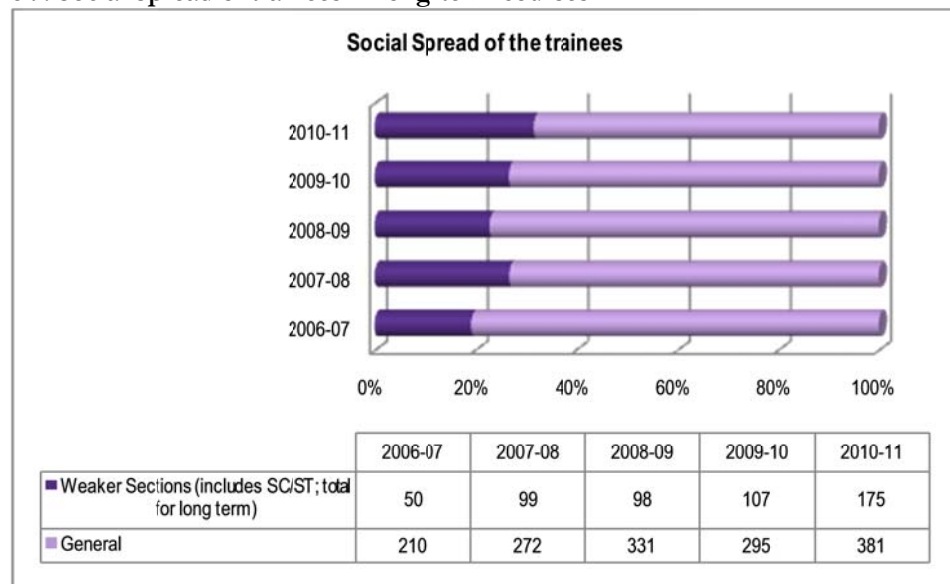
Inclusive Growth underlined by Social Impact

IGTR has made a good impact in both the areas of tooling and training. It admits more than 4000 trainees in various training programmes. It has generated cash surplus after meeting all expenditure including depreciation in the financial year 2010-2011 and has set an example for Government Tool-Rooms. It has provided support to its ex-trainees to start their own Tool-Rooms and machine shops. Interviews with three such ex-trainees brought out the effective technological support IGTR is rendering to such trainees. They have started with simple conventional machines and use IGTR common facilities to complete complex operations. Attempts in this direction need to be intensified so that Govt. Tool-Rooms act as a catalyst to augment tooling capacity in the country to bridge the gap between demand and supply failing which there will be increase in import of tools.

Social Spread of Trainees

The IGTR attracts good response from economically weaker sections. During 2010-11, 31% of trainees were from weaker sections as reflected in Figure 9.

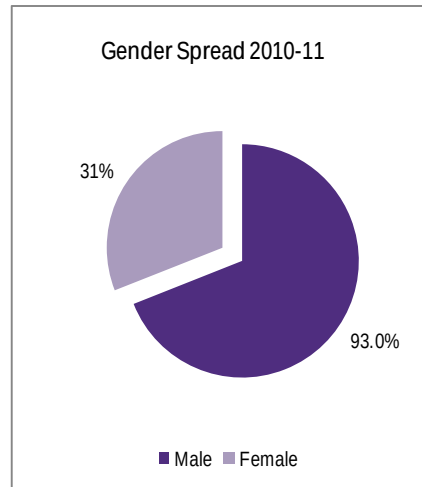
Figure 9: Social Spread of trainees in long-term courses



Gender Spread

Gender spread in IGTR's training programmes is encouraging. 31% of the trainees admitted were females as shown in Figure 10.

Figure 10: Gender Spread



In all, the impact generated by IGTR Aurangabad is very effective and strong. The Tool Room has set several precedents that can be emulated and adapted by other Govt. Tool Rooms.

SWOT

Strengths

- It is the most well equipped commercial Tool-Room in the Western Region.
- It has versatile software packages in CAD/CAM and trained personnel to use the same.
- It has a well trained team of engineers, operators and trainers.
- IGTR is set up with development objectives and offers its services without commercial objectives
- No bank interest is required to be paid on funds invested in new equipment.
- IGTR has expertise for quality of its products in the field of Tooling and Training Services
- IGTR has a good training expertise and equipment.
- Has developed specialisation in press tools and die casting dies.
- It has a well documented Personnel Policy.

Opportunities

- IGTR has established reputation of a quality tool maker.
- Significant scope for scaling up training and tooling services given the favourable market conditions
- Abundant demand for tooling. According to TAGMA tooling demand in the country is Rs.13225 crores of which press tools and die casting dies account for Rs.73%.
- Location in a growing industrial area with focus on auto components
- Huge requirement of trained manpower
- Government support for capital investment is available

Weaknesses

- IGTR does not run expensive machines round the clock leading to low level of utilization of installed capacity
- There is maximum limit on the amount of incentive which can be distributed although more amount is available/earned based on performance.
- Limited use of Financial and Management Information systems
- Decision making body, the Governing Council, meets less often than intended or needed.

Threats

- Monitoring based on indicators of self sustainability has diluted impact on MSMEs for whom IGTR was set up
- Easy procedures and low customs duties for import of tools. TAGMA's latest survey indicates that more than 30 % tooling is imported in the country.
- Low price levels and faster deliveries of tools from some countries, especially China and Taiwan.
- MSMEs prefer low costs of tools compared to high cost tooling services provided by IGTR

Conclusion

IGTR has made significant impact in creating skilled manpower, producing precision tooling and components and in disseminating new technologies. However, sustaining and scaling up the impact in the direction of assistance to MSMEs is imperative which would be major challenge given constraints like more easy money available from large industries and mandate to recover costs including depreciation. Management team is competent to meet the challenge.

The policy direction and monitoring indicators mainly gives weightage to self sustainability which needs to be revisited as the impact on MSMEs and job creation is of equal significance. Over emphasis on cost recovery and related financial indicators has danger of reduced impact on the MSMEs and skill development. It is also necessary that IGTR develops an understanding of the current and emerging MSME needs (especially local clusters) on both training and tooling fronts. A formal survey of the MSME market, relevant to IGTR is needed for this purpose. There is also a need for better networking and use of modern financial and management systems through an FMIS. This would be essential to establish short and long term targets with an eye on the impact on MSMEs.

Annexure I

Details of Visits

List of official met during visit of GT Team to Aurangabad

Name of the Organisation	Names of Officials	Designation
MSME Indo-German Tool-Room, Aurangabad	Shri H.D. Kapse	General Manager
	Shri R.D. Patil	Senior Manager – Production-PPC
	Shri V.M. Jadhav	Manager – Production
	Shri G.S. Awsekar	Manager Training
	Shri A. Daithankar	Sr. Admin. Officer
	Shri J.D. Bhagul	Sr. Er. Design & QC
Marathwada Association of Small Scale Industries & Agriculture, Aurangabad	Shri S.P. Kulkarni	President
	Shri S. Bhosale	Vice President
	Dr. Uday D. Girdhari	Hon. Secretary
Rucha Engineers Pvt.Ltd., Aurangabad	Shri U.M. Dashrathi	Proprietor
Madhura Die Casting Pvt.Ltd	Shri A.B. Gaike	Managing Director
Vital Tools, Aurangabad	A.K. Kale	Proprietor
Unitech Industries, Aurangabad	Shri R.D. Jain	Proprietor
Pride Engineers, Aurangabad	Shri Bipin Mupde	Proprietor
PreciTech Enterprises, Aurangabad	Shri L.M. Korgaonkar	Partner
Expert Global	Shri P. Deshpande	Trusted Partner
Kwality Engineers, Aurangabad	Shri Shahebaz	Proprietor
Pyramid Industries	Shri G.R. Gaveli	Partner
	Shri Ghanshyam Sarodi	Partner

Annexure II

Training Courses

List of Long Term and Short Term Training Courses conducted at IGTR

Course	Durati on	Fee / Stude nt	Inta ke	Selection Criterion	Typical job on placement	Entry Level Salary and Growt h
Long Term						
ADVANCE DIPLOMA IN TOOL & DIE MAKING	4 Years	120000	60	Through Entrance	Engineer / Supervisor	10000
CERTIFICATE COURSE IN MACHINIST (TOOL-ROOM)	2 Years	45000	20	Through Entrance	Engineer / Supervisor	7000
POST GRADUATE DIPLOMA IN TOOL DESIGN & CAD/CAM	18 Months	90000	30	First-cum-First-Serve	Engineer / Supervisor	15000
POST DIPLOMA IN TOOL DESIGN & CAD/CAM	12 Months	60000	30	First-cum-First-Serve	Engineer / Supervisor	10000
POST DIPLOMA IN TOOL DESIGN & MANUFACTURING	12 Months	60000	30	First-cum-First-Serve	Engineer / Supervisor	10000
ADVANCE CERTIFICATE COURSE IN TOOL DESIGN & CAD/CAM	12 Months	60000	30	First-cum-First-Serve	Supervisor / Technician	8000
ADVANCE COURSE IN CNC MACHINING	12 Months	50000	30	First-cum-First-Serve	Technician	8000
CERTIFICATE COURSE IN ADVANCE MACHINE MAINTENANCE	12 Months	30000	30	First-cum-First-Serve	Technician	8000
CERTIFICATE COURSE IN MACHINE TOOL OPERATIONS	12 Months	25000	30	First-cum-First-Serve	Technician	6000
CERTIFICATE COURSE IN CNC TURNING & CNC MILLING	12 Months	50000	30	First-cum-First-Serve	Technician	6000
CONDENSED COURSE IN TOOL & DIE MAKING	12 Month	40000	30	First-cum-First-Serve	Technician	6000

	s					
POST DIPLOMA IN TOOL DESIGN	6 Months	35000	30	First-cum-First-Serve	Technician	8000
POST DIPLOMA IN CAD/CAM	6 Months	35000	30	First-cum-First-Serve	Technician	8000
Short Term						
AUTOCAD	72 Hours	2500	20	First-cum-First-Serve	On-Job Skill Development	-
SOLIDWORKS	72 Hours	4000	20	First-cum-First-Serve	On-Job Skill Development	-
UNIGRAPHICS (CAD)	96 Hours	6000	20	First-cum-First-Serve	On-Job Skill Development	-
PRO-E	96 Hours	6000	20	First-cum-First-Serve	On-Job Skill Development	-
CATIA	96 Hours	6000	20	First-cum-First-Serve	On-Job Skill Development	-
UNIGRAPHICS (CAM)	96 Hours	6000	20	First-cum-First-Serve	On-Job Skill Development	-
MASTER CAM	72 Hours	4000	20	First-cum-First-Serve	On-Job Skill Development	-
DELCAM	72 Hours	4000	20	First-cum-First-Serve	On-Job Skill Development	-
ANSYS	72 Hours	6000	20	First-cum-First-Serve	On-Job Skill Development	-
HYPERMESH	72 Hours	10000	20	First-cum-First-Serve	On-Job Skill Development	-
CNC PROGRAMMING & MACHINING	96 Hours	5000	20	First-cum-First-Serve	On-Job Skill Development	-
CNC MACHINING (LATHE)	72 Hours	6000	20	First-cum-First-Serve	On-Job Skill Development	-
CNC MACHINING (MILLING)	72 Hours	6000	20	First-cum-First-Serve	On-Job Skill Development	-
CNC MACHINING (EDM)	72 Hours	6000	20	First-cum-First-Serve	On-Job Skill Development	-
CNC MACHINING (WEDM)	72 Hours	6000	20	First-cum-First-Serve	On-Job Skill Development	-
PLC PROGRAMMING	96 Hours	5000	20	First-cum-First-Serve	On-Job Skill Development	-
BASIC HYDRAULICS	48 Hours	1500	20	First-cum-First-Serve	On-Job Skill Development	-
BASIC PNEUMATICS	48 Hours	1500	20	First-cum-First-Serve	On-Job Skill Development	-
ELECTRO-HYDRAULICS	48 Hours	1750	20	First-cum-First-Serve	On-Job Skill Development	-
ELECTRO-PNEUMATICS	48 Hours	1750	20	First-cum-First-Serve	On-Job Skill Development	-
DESIGN OF JIGS & FIXTURES	48 Hours	4000	20	First-cum-First-Serve	On-Job Skill Development	-
DESIGN OF MOULDS	48 Hours	4000	20	First-cum-First-Serve	On-Job Skill Development	-
DESIGN OF PRESS TOOLS	48 Hours	4000	20	First-cum-First-Serve	On-Job Skill Development	-

DESIGN OF DIE CASTING DIES	48 Hours	4000	20	First-cum-First-Serve	On-Job Skill Development	-
DESIGN OF CUTTING TOOLS	48 Hours	4000	20	First-cum-First-Serve	On-Job Skill Development	-
BASIC COURSE IN METROLOGY	48 Hours	3000	20	First-cum-First-Serve	On-Job Skill Development	-
BASIC COURSE IN CMM	48 Hours	4000	20	First-cum-First-Serve	On-Job Skill Development	-
GEOMETRICAL DIMENSIONING & TOLERANCES	48 Hours	3000	20	First-cum-First-Serve	On-Job Skill Development	-
COMPUTER HARDWARE MAINTENANCE & NETWORKING	3 Months	12500	20	First-cum-First-Serve	On-Job Skill Development	-
ADVANCE NETWORKING	3 Months	12500	20	First-cum-First-Serve	On-Job Skill Development	-

Annexure III

Production Equipment

Machines	Make/Model	Max Job Wt	Axes	Accuracy
CNC Wirecut	AgieCharmillies FL 440 CCS	1500 Kg	X,Y,Z,U,V	+/-0.001 mm
CNC Milling	She Hong Industrial Corp.HB2150 SG	7000 Kg	X 2100 Y 1500 Z 800	+/-0.005/300 mm
CNC Milling	Haas Automation VM-6	1800 Kg	X 1620, Y 813, Z 762 mm	+/-0.005 mm
CNC Vertical turret Lathe	Honor Seiki, VL-100 C	3500 Kg	X 1100 Z 700	0.015 mm
CNC CMM	Carl Zeiss Prismo 5 Vast	800 Kg	X 700Y 900 Z 500	MPEE 1.5+L/350 um
CNC CMM	Hexagon Metrology Global 575	600 Kg	X 500Y 700 Z 500	MPEE 1.9+L/333 um.
CNC Wirecut	AgieCharmilliesRobofil 510	1000 Kg	X 700 Y 400 Z 400	+/- 0.005 per 300 mm
CNC Wirecut	AgieCharmilliesRobofil 300	500 Kg	X 400 Y 250 Z 400,	+/- 0.005 per 300 mm
CNC Wirecut	Electronica Machine Tools Ultima 2 S	1000 Kg	X 600 Y 400 Z 450	+/- 0.005 per 300 mm
CNC Milling	DMG DMC 70 V Hi- dyn	800 Kg	X 700, Y 550,Z 500	+/- 0.005 mm
CNC Lathe	DMG CTX 400	100 Kg	X 250, Z 635	+/- 0.005
CNC Milling	Haas Automation VF-2 SS	680 Kg	X 762 Y 406 Z 508	+/- 0.005 mm
CNC Lathe	Haas Automation SL-20	100 Kg	X 262, Z 508	+/- 0.005
Surface Grinder	Kent Industrial Co, KGS 715	1400 Kg	1500 x 700	0.02 mm/min
Surface Grinder	Kent Industrial Co, KGS 63	420 Kg	650 x 300	0.02 mm/min

Annexure IV

Training of Personnel

Training skill development programmes organised for IGTR employees

Sl. No.	Training Programme	No. of employees deputed
1	Seminar on Standard Products	Manager : 1 Sr. Engineers : 4 Engineers : 14
2	ISO 9001:2008 Awareness	Sr. Engineers: 2 Engineers : 3
3	In House Application Training on CNC Lathe Haas SL-20	Engineers : 4 Technicians : 5
4	CATIA V5 R 19	Engineers : 3
5	Advance Application & Maintenance Training on Charmilles CNC Wire cut EDM	Engineers : 5 Foreman : 1 Technicians : 8
6	Unigraphics UG NX 7	Sr. Engineers : 2 Engineers : 2
7	Library Management	Librarian : 1
8	“Solodworks”	Engineers : 5
9	OSHAS 1800:2007 Awareness	Managers : 2 Sr. Engineers: 4 Engineers : 5 Others : 9
10	Hand Deburring Tools	Technicians :5
11	Excise and service Tax	Sr. Managers : 2 Managers : 2 Sr. Engineers : 3 Others :4
12	Indo-US Workshop on Fabrication	Engineers :2
13	Design Awareness	Manager : 1 Engineer : 1
14	Recent Trends in Library and Computer Science	Librarian : 1



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Strategic Assessment of MSME Tool Rooms

As Is Assessment Report – CTTC Bhubaneswar

Prepared for

**Micro, Small and Medium Enterprises
Umbrella Programme**



Knowledge Partner:



Grant Thornton

Contents

	Page
Abbreviations Used	5
Executive Summary	7
Introduction	10
Chapter I - Organisational Profile	12
Chapter II- Governance, Management Systems and Processes	14
Chapter III- Organisational Assessment	18
Chapter IV- Overview of Local Business Environment from Tool- Room Perspective	35
Chapter V- Inclusive Growth underlined by Social Impact	38
SWOT	40
Conclusion	41
Annexure I- Details of visits	42
Annexure II- Training Courses	43
Annexure III- Production Equipment	46
Annexure IV- Training Equipment	49
Annexure V- Training of Personnel	53

Table 1: Profile.....	12
Table 2: Annual Targets.....	15
Table 3: Service Mix.....	18
Table 4: Service - Sector Mix.....	19
Table 5: Sources of revenue.....	19
Table 6: Sector mix of revenue from production of services.....	19
Table 7: Training Income from various courses	21
Table 8: Spread of products, percentages based on values	24
Table 9: Industry Break-up in numbers	25
Table 10: Facility Break up of CTTC Bhubaneswar	27
Table 11: Power Back up.....	27
Table 12: Personnel.....	29
Table 13: Retention Pattern	30
Table 14: Machine Utilization.....	31
Table 15: Net worth trend over 5 years	32
Table 16: Government Grants	32
Table 17: Net worth without Government Grants.....	32
Table 18: Trend of Income and Expenditure	34
Table 19: Backward Linkages	36
Figure 1: Organization Chart.....	13
Figure 2: Revenue mix from production related services	20
Figure 3: Number of persons trained.....	21
Figure 4: Training Income from various courses	21
Figure 5: Placement Break up of Long Term Courses (No. of Trainees placed).....	22
Figure 6: Spread of Income: Tooling Services	25
Figure 7: Repeat Order 2010-11	26
Figure 8: Geographic spread of the production services supplied	26
Figure 9: Break-up of infrastructure.....	27
Figure 10: Profitability and Composition	33
Figure 11: Trend Analysis.....	34
Figure 12: Social Spread of Trainees	39
Figure 13: Gender Spread	39

Abbreviations Used

AICTE	All India Council of Technical Education
CAGR	Compound Annual Growth Rate
CTTC	Central Tool- Room and Training Centre
CAD	Computer Aided Design
CNC	Computer Numerical Control
CAM	Computer Aided Manufacturing
D	Dimensional
DANIDA	Danish International Development Agency
DC	Development Commissioner
DG	Diesel Generating
EDM	Electric Discharge Machining
ESPD	Entrepreneurship & Skill Development Programme
FMIS	Financial & Management Information System
FY	Financial Year
GFR	General Financial Regulations
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GOI	Government of India
HOD	Head of Department
HRD	Human Resource Development
HT	Heat Treatment
ISO	International Standards Organisation
IT	Information Technology
ITI	Industrial Training Institute
IMTEX	India Metal-cutting Machine Tool Exhibition
IITF	India International Trade Fair
L 1	First Lowest
M/C	Machine
MIS	Management Information System
MoMSME	Ministry of Micro, Small and Medium Enterprises
MSME	Micro, Small and Medium Enterprises
NID	National Institute of Design
NTTF	Nettur Technical Training Foundation
OEM	Original Equipment Manufacturers
PG	Post Graduate
QCI	Quality Council of India
SOP	Standard Operating Procedure

Executive Summary

Tool- Room is the backbone of manufacturing industry. To assist MSMEs with infrastructure in tool engineering, government set up Indo Danish Tool- Room at Bhubaneswar for design and manufacture of tools and training of manpower in employable skills in tool making and allied trades. It has been operating as Government of India Society under the Chairmanship of DC MSME since 1992. During the collaboration period total investment in the project was Rs.58.44 crores of which Governments of India, Denmark and Odisha contributed Rs.30.86 crores, and Rs.17.80 crores and Rs.9.78 crores, respectively. State of the art tool production facility is installed at CTTC which includes high end tool machines, CNC milling and turning machines, CNC wire cut machine, Jig Boring Machine, Jig Grinding Machine.

CTTC's performance is excellent in revenue generation. In 2010-11 it has recovered all costs including depreciation. In this year, its income was Rs.1506.97 crores, percentage recovery ratio including depreciation was 114 % which is the highest amongst 10 Tool- Rooms. Operating income and expenditure (without depreciation) in recent years was as below;

Rs. in lakhs					
Year	2006-07	2007-08	2008-09	2009-10	2010-11
Income	655.49	864.93	1028.76	1185.11	1506.97
Recurring Expenditure	459.33	542.76	682.13	789.42	997.83
Income minus expenditure	196.17	322.17	346.63	395.69	509.14

A hard working and motivated team is in position at CTTC. Present General Manager is providing an effective leadership. Locatiationally, with a disadvantage of less industrial development in the surrounding area, they searched, found and captured the market elsewhere to put the equipment available to optimum use. In 2010-11, they have recovered full costs including depreciation and have, thereafter, generated a surplus of Rs.1.76 crores.

An incentive scheme is in position to motivate employees towards better performance. About 4 months' salary is likely to be paid as incentive for performance during 2010-11 (subject to ceiling for employees with higher basic salary, which is also understandable). Good HR policy is in vogue. Communication channels are maintained at all levels of employees. There is a systematic approach to depute employees for skill and management development programmes.

Machines utilization is 59% of capacity, based on three shifts working which is industry norm for high value equipment. If capacity is calculated on two shift basis, utilization is 84%.

Training department is comparatively better than the tooling division; contributing 65% to revenue. With 20% of employees, training has generated 65% revenue.. CTTC is however lagging in assistance to MSMEs. In terms of numbers, share of MSMEs was 45 % in 2010-11 but in terms of value it was only 2.29%. CTTC trained 9570 personnel in its training programmes in 2010-11 and target for 2011-12 is to train 10000 trainees.

CTTC's objectives are to assist MSMEs of the eastern region to enhance their competitiveness by providing them high quality tools, common facilities in machining, consultancy to increase the quality and productivity of their products, train young individuals for the industry and sharpen skills of existing employees from the industry. It has done exceptionally well in vocational skill development. It has also made contributions in developing soft skills in MSME entrepreneurs by establishing quality forums and organising productivity related seminars. It is the only Tool-Room promoting various components of National Manufacturing Competitiveness Programme launched by DC MSME such as lean manufacturing, quality technology tools, design clinics etc for the benefits of MSMEs. CTTC has developed great expertise in manufacturing of components for aerospace industry, which forms major chunk of its income. Owing to these efforts, its Order book is full for next three years.

On the tooling front, CTTC faces an unfavourable situation where user industry has not developed in Odisha. While there is optimism, it will take some time before the local market develops to be able to make optimum use of its facilities. It needs greater effort to move towards this objective. Value wise, tooling share is 5 % of its revenue and 15 % of revenue from production.

Currently, there is more emphasis on cost recovery which has diluted the efforts in making contribution of assistance to MSMEs in the area of tooling. As a result, priority is to go in for jobs which give higher revenues rather than hand holding the industrial units, especially micro and small units. It will be counterproductive, if not suicidal, to ask Tool-Room to stop or cut down component production and concentrate on tooling. Not diluting aerospace components, increasingly higher targets, in terms of value, should be fixed for providing assistance to MSMEs and outreach and create impact in this area. In a period of two to three years it could form a significant share. CTTC management is competent to achieve this. Until user industry develops in Odisha, orders for tooling or tool parts can be fetched from other areas as done in case of components.

CTTC being a Government of India Society has to work under the guidelines of the Government. There are several constraints faced by Tool Room in its current set-up. Some of the key challenges, constraints and solutions are tabulated below:

<u>Division/ function/ process</u>	<u>Challenge/constraints</u>	<u>Key solutions /ideas</u>
Tooling Production	CTTC's current share of tool production is 22% of the total production related services.	To decide policy to increase the share of tool design and manufacture of tools and tool parts and fixing targets accordingly.
Management Systems	Data on estimates costs quoted and actual costs is not analysed for future corrective action in case of cost overruns. Post placement tracking of trainees is inadequate. The Tool Room is therefore, not able to leverage ex-trainees in marketing as some of the trainees occupy important positions in tool planning in industry	Design of IT enabled Financial and Management Information System (FMIS) is needed for continual improvement and accountability which can be linked to a suitable reward / incentive system. Suitable training and capacity building of the staff is necessary alongside.
Pricing of services	The machine hour rates were approved by the Governing Council in the year 2008.	Based on a market study, CTTC should give reasonable

	General Manager is now authorised to increase the same by 5% per year depending upon the market conditions. Users find discount of 25% allowed to MSMEs inadequate. They find CTTC prices higher than private tool makers.	discounts to MSME. DC MSME should examine if discounts allowed could be reimbursed to CTTC like fees of SC/ST trainees.
Lack of marketing strategy for tooling services	CTTC does not have a marketing strategy for its tooling division based on market assessment, or any study or survey of market needs and market segmentation	The marketing team should have a strategy which is based on market need assessment and segmentation. Market study, in this respect, needs to be carried out.

Introduction

Background Information

Tool- Room is the backbone of Industry as manufacturing excellence begins with tools, dies and moulds. To foster the growth of Micro, Small and Medium scale industries, Government of India set up ten Tool- Rooms across the country with state of the art equipment for design and manufacture of tools and for training of manpower in employable skills. Of these, four were set up with the assistance of Government of Germany, three with the assistance of Government of Denmark, two under UNDP and one without any external assistance. These Tool- Rooms are set up as autonomous bodies, Government of India societies, with DC MSME as the Chairman. Central Tool- Room and Training Centre at Bhubaneswar is one of the three Tool- Rooms set up under Danish assistance.

The Tool- Rooms have now been operating for about 10 years after close of the agreements of external assistance. Deutsche Gesellschaft für Internationale Zusammenarbeit is supporting an evaluation study of 10 Tool- Rooms. M/s Grant Thornton Advisory Private Limited have been retained as Consultants to carry out the Study. Tool- Rooms under the State Governments are outside the scope of this Study.

Terms of Reference

The consultant team has been tasked to analyse the existing strengths and weaknesses of the ten Tool- Rooms in terms of their management, finances, human resources, technology and infrastructure, as part of the assessment of Tool- Rooms that includes the following:

- a. Institutional / organisational development study of the scheme consisting of political economy aspects involving actors, financial flows, management systems and inter-agency issues
- b. stakeholder feedback on existing Tool- Room services from MSMEs and relevant business associations
- c. stakeholder feedback on further requirements from Tool- Rooms by MSMEs and relevant business associations [a,b to be executed in form of a user feedback survey]
- d. training needs of Tool- Room personnel
- e. Comparison of services with similar private sector and German facilities.
- f. Best practices from comparable national institutions such as the Nettur Technical Training Foundation (NTTF), Bangalore [NTTF is a private educational trust established with Swiss assistance.]

Methodology

Data has been collected through secondary research, publicly available information on MSME Tool- Rooms and through a structured questionnaire, filled by the respective Tool- Rooms. Facility of the Tool- Room was visited and a series of meetings and discussions took place with senior and middle

management of Tool- Room, local associations, suppliers, users and non-users MSMEs, large client and state government agencies for qualitative assessment.¹

Based on the quantitative information and qualitative assessment, functioning of each Tool- Room has been assessed and analysed to provide actionable recommendations. For improving alignment of Tool- Room services to the strategic goals of government in setting them up through optimum mix of different service and delivery approach, increased revenue, outreach and impact; improved organisational procedures and governance mechanism, technological and human resource development need, enhanced networking etc. Recommendations shall be accompanied by a time-bound and cost estimated action plan for the DC-MSME for implementation. Cost estimates would refer to requirements of additional machinery or equipment, general infrastructure, staff restructuring and training etc that would be needed to implement the recommendations. In addition, an institutional analysis framework that can be used by DC MSME in future will also be developed.

However, this report is limited to AS_IS assessment and analysis of functioning of Tool-Room and recommendations are part of a separate report.

Structure of the report

Given below is a summary of how the report has been structured:

Chapter I – Organisation Profile: A brief description of CTTC Bhubaneswar.

Chapter II – Governance, Management Systems and Processes: This chapter assesses the autonomy of the Tool- Room and its Chief Executive, the General Manager, guidelines followed by the Tool- Room defined by the Ministry of MSME and the level of interaction between DC MSME and the Tool- Room.

Chapter III – Organisational Assessment: This chapter assesses the current status of service portfolio, technological infrastructure, marketing strategy, finance, management systems, human resource and its impacts against the stated policy goals.

Chapter IV – Overview of local Business Environment from Tool- Room perspective: This chapter assesses the location of the Tool- Room and the market potential for it to expand its services. It also analyses the availability of raw material and machinery suppliers in the region.

Chapter V – Inclusive Growth underlined by Social Impact: This chapter analyses the impact of CTTC in all the three areas of training, tooling and dissemination of environmentally friendly technologies to MSMEs.

¹ Complete list of meetings and interview is placed at Annexure I.

Chapter I

Organisational Profile

CTR Bhubaneswar

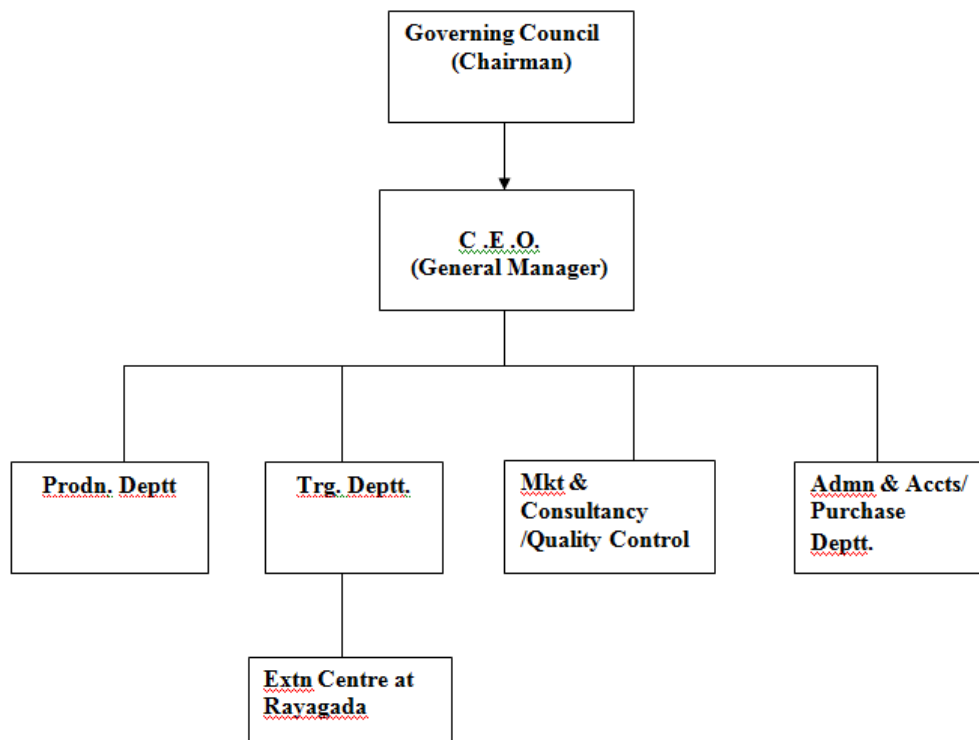
Table 1: Profile

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1.	Project Background	Central Tool- Room and Training Centre (CTTC), Bhubaneswar, was established as a training and common facility centre in the area of tooling for promotion of the small-scale industrial units in Odisha and nearby areas of adjoining states. It was set up under second phase of Indo-Danish Technical Co-operation Programme in the area of Tool- Room vide Agreement of 1989 between the Governments of India and Denmark starting operations in 1992. It has branch sub-centre in Rayagada.								
2.	External Aid Agency	Government of Denmark, Danish International Development Agency (DANIDA)								
3.	Project Cost	Rs.58.44 crores (up to period of collaboration with DANIDA)								
4.	Funding Pattern (figures in Rupees in Crores)	<table><tr><td>GoI</td><td>GoO</td><td>DANIDA</td><td>Total</td></tr><tr><td>30.86</td><td>9.78</td><td>17.80</td><td>58.44</td></tr></table>	GoI	GoO	DANIDA	Total	30.86	9.78	17.80	58.44
GoI	GoO	DANIDA	Total							
30.86	9.78	17.80	58.44							
5.	Organisation Structure	Government of India Society – an autonomous body under MoMSME, DC MSME								
6.	Objectives	• To increase the efficiency of MSMEs in the eastern region in the light engineering and allied fields by providing support in the area of design & production of tools, jigs, fixtures and advisory and consultancy services. • To manufacture small and medium sized tools such as press tools, jigs & fixtures, moulds, dies and special purpose tools. • To provide common facilities for precision machining operations for manufacture of tools, jigs & fixtures, moulds and dies and for Heat Treatment. • To conduct long term technical training in tool design and manufacture. • To conduct short-term and part-time courses for the representatives of MSMEs of the region.								
7.	Technology	Following technologies are available at CTTC for tooling, production, training and rapid prototyping:								

		a. The tool production facilities include CNC milling and turning machines, CNC wire cut machine, Jig Boring Machine, Jig Grinding Machine b. Precision machining facilities for production of short batches of components c. State of the art Vacuum Heat treatment facilities d. CNC Co-ordinate Measuring Machine e. Modern and versatile hardware and software for computer based design, machining and execution of vocational education and technical training programmes
8.	Training Programmes	a. Long-Term Courses (One year or more duration)- 1. Four-Year Diploma Course in Tool & Die Making. This course is approved by All India Council for Technical Education (AICTE), Delhi. 2. Two-Year Certificate Course in 'Machining Operations', 'ITI Machinist' and 'ITI Fitter'. 3. Eleven Courses of one year duration in various areas connected with tool making and allied trades. b. Short-Term Courses (Less than one year) CTTC conducts a large number of short term training courses based on Mechanical, Non Mechanical and CAD/CAM/CAE bases

Figure 1: Organization Chart



Chapter II

Governance, Management Systems and Processes

This chapter assesses the autonomy given to the local management, procedures followed by the Tool- Room defined by the Ministry of MSME and the level of interaction between DC-MSME and the Tool- Room. This also assesses the role of GC in the overall functioning of the Tool- Room. This is to analyse how all these factors are contributing or hindering the performance of CTTC Bhubaneswar.

Policy Goals and Direction

CTTC has made good progress in expansion of its activities and on financial account. It is making full cost recoveries including depreciation. When tooling demand from the region was a limiting factor, the management took a decision to look for orders elsewhere and diversify its products to include precision components for which aerospace industry is the biggest customer. Tool-Making needs engineering skills of a high order. Component production is repetitive work which any tool making unit can handle. CTTC's training programme became popular due to expertise available in engineering skills of tool-making and dilution of tool making will ultimately affect training popularity.

While component production is good, CTTC management should take a strategic and policy decision to increase the share of tool design and manufacture, fix targets in this regard and strive to achieve the targets. For a Tool- Room, component production is good gap filler but having it as a main thrust will not really promote MSMEs in the region.

Core Management Team

Core management team at CTTC is well-knit and motivated under a good leader, the General Manager, who is also supported by an able deputy general manager. All departments are headed by senior managers who command respect and authority. An incentive scheme is in place, all employees are deputed for development programmes, and the HRD takes care of career progress of its employees.

Annual Targets

There is no formal need assessment undertaken to estimate the market opportunity for its services. Each year annual targets are fixed for training and production which are not linked to the market opportunity or desired level of impact. The targets are both financial and physical. However, there are no targets with respect to the number, quality and value of assistance to MSMEs. Table 2 details the targets achieved by the CTTC in the year 2010-11

Table 2: Annual Targets

Service	Target	Achievement	Achievement %
Training (Physical)	7000 persons	9570 persons	137 %
Training (Revenue)	Rs750.00 lakhs	Rs.978.37 lakhs	130 %
Production (Revenue)	Rs.450.00 lakhs	Rs 453.19 lakhs	101 %

Source: Annual performance of CTTC, Bhubaneswar

Management System

The CTTC is ISO certified organisation for the following standards.

- ISO 9100
- ISO 1400
- OHSAS 18001

There are Standard Operating Procedures (SOPs) which are documented and followed at the CTTC:

1. Preventive Maintenance
2. Estimation Sheet for quoting the prices for tooling
3. Order processing
4. Quality assurance
5. In – process inspection report (including inspection of re-work)
6. Final inspection report
7. Performance (trial)of the tool job completed
8. Inspection report for the raw materials purchased
9. Calibration Control Card for instruments
10. Product Release Note and Deviation Note
11. Rejection Report
12. Customer satisfaction
13. Design of Training Programmes
14. Evaluation of training programmes

A system is in place to compare and analyse the cost estimates prepared at the time of quoting and actual cost on completion. Design of IT enabled Financial and Management Information System (FMIS) is a requirement. Continual improvement and accountability can be enhanced through the use of FMIS which can be linked to a suitable reward/incentive system. Suitable training and capacity building of the staff is necessary alongside.

Procurement system

For procurement of raw materials for tool-making, the Tool- Room needs to follow the procurement guidelines laid down in the General Financial Rules (GFR) calling for quotations and decision making guided by L 1 principle due to which suppliers tend to quote lower rates, sometimes compromising on quality. The procurement procedures take 2 to 4 weeks which could lead to delay in deliveries which run parallel when tool is to be designed. Being a public institute CTTC has to follow the financial regulations. By fast action and careful drawing of specifications CTTC is able to overcome these hurdles. Procedures will have to be simplified when tooling activity increases. Rate contracts are a possibility.

For capital goods, an action plan with details of equipments and related costs is prepared in consultation with local GC members and submitted to DC-MSME at the beginning of FY in consultation with Integrated Finance Wing of the MoMSME. It is then ratified by the Governing Council. However, there are instances, when request for funds is submitted and Integrated Finance Wing sometimes raises objection at this stage although it was concurred in by them before. Procedure needs to be simplified and if Integrated Finance has agreed before they should not object at the advanced stage. Since the capital goods are also procured on least-cost basis, two bid system

should be used. It may be advisable to seek performance bank guarantee from the supplier for a limited period to ensure desired performance of plant and machinery.

Development of a procurement manual covering the operational details on above suggestions would be beneficial to improve efficiency and effectiveness of procurement.

Networking with other Tool- Rooms, institutions and alumni

CTTC can significantly improve networking with alumni which can lead to more business and placements. The training initiative can be scaled up through networking with institutions having infrastructure available with them e.g. ITIs, Polytechnics, state government Tool- Rooms/ institutions, etc. There are more than 5 such institutions in Bhubaneswar itself. Networking with other Tool- Rooms under MoMSME would also be useful for knowledge and capacity sharing. It should be done at HoD level in addition to General Manager's level. Again, IT enabled platform for such networking is essential.

Interaction with DC MSME

DC MSME monitors the performance of Tool-Room. System is in place under which Tool Room submits the following reports:

a) Performance report, submitted monthly. Against annual targets, following information is submitted for the month and cumulative during the year up to the month of report:

Revenue, expenditure, order position, delivery status, machine utilization, number of trainees and number of MSMEs assisted. Tool Room is required to explain the short falls, if any

System brings out cost recoveries but not the impact and outreach to MSMEs. Instead of monitoring numbers, it should bring out the value of assistance provided to MSMEs and highlights of 5 technology related assistance cases. System should also be evolved to monitor customer and trainee feed backs of courses conducted.

b) Annual action plan containing targets and funds needed during the year for recurring and non-recurring expenditure. It is prepared in consultation with local members and submitted to DC MSME who approves the same in consultation with Integrated Finance Wing of the Ministry. It is then put to Governing Council for ratification. Role of Governing Council is limited to local members who are consulted. Ratification is a formality.

c) Monthly status of courts cases in which DC MSME is respondent.

d) Annual Report which includes audited annual accounts for placement before the Parliament.

e) Information on innovative work done. This is used for preparation of Cabinet Note on performance of MoMSME.

f) Annual manpower status.

Decision Making

Management of the Tool Room is with the Governing Council. However it meets once in a year, on an average, when convened to pass Annual Accounts and Annual Report. These meetings are generally held away from the Tool Room premises. Also representatives of industry are not found to be taking interest in decision making and it is generally the officials from MoMSME and state Govt. who deliberate in the meetings. So Management and the Council are same. Members other than officials are volunteers. It is needed that the structure is revised in favour of greater percentage of

independent members with no personal or professional relation with Tool Room e.g. representatives from universities and technology leaders. They should be paid honorarium for their services.

While expectations from CTTC are now like from a private commercial Tool Room, it is not allowed that independence. Tool Room performing better and recovering full costs including depreciations should have greater autonomy like a private Tool Room.

Chapter III

Organisational Assessment

This chapter assesses the current status of service portfolio, technological infrastructure, marketing strategy, finance, management systems, human resource and its impacts against the stated policy goals. This chapter also analyses different factors which are either contributing to or hindering the performance of CTTC Bhubaneswar in achieving its stated objective and policy goals of “enhancing competitiveness of manufacturing MSMEs through tooling services and availability of skilled manpower”.

Overview of Services

The following services are currently being offered by the CTTC

Table 3: Service Mix

Production		
Tool related services	Job work	Training
• Manufacture of Plastic moulds, press tools, jigs & fixtures, gauges, extrusion dies, die casting dies etc. • Design of Plastic moulds, press tools, jigs & fixtures, gauges, extrusion dies, die casting dies etc. using software's such as Pro-E, CATIA, UG, ANSYS, Hyper mesh • Machining of tool parts • Heat treatment of tool parts • Tool try out • Repair of tools • Consultancy on tooling	• Modern heat treatment facilities by use of vacuum heat treatment technology which produces heat treated parts with minimal distortion and scaling. ○ Tool parts ○ Components • Manufacture of components for aero-space applications for ISRO, Aeronautical Development Agency, IISU, Hindustan Aeronautics Ltd.	Long-Term Courses (One year or more duration)- • Four-Year Diploma Course in Tool & Die Making. This course is approved by All India Council for Technical Education (AICTE), Delhi. • Two-Year Certificate Course in 'Machining Operations', ITI Machinist' and 'ITI Fitter'. • Eleven Courses of one year duration in various areas connected with tool-making and allied trades. Short-Term Courses (Less-than-one year) • CTTC conducts a large number of short term training courses based on Mechanical, Non-Mechanical and

	CAD/CAM/CAE bases
In addition to the above, CTTC also provides Consultancy and support to MSMEs to improve productivity by use of better tools and / or better production processes	

The service – sector matrix below indicates the services utilisation by respective sectors:

Table 4: Service - Sector Mix

Type of Tools/ services	Industry Sectors							
	Aerospace	Light Engg.	Fasteners	Plastic/ Rubber	Auto Components	Sewing machines	Home Appliances	Others
Heat Treatment			√					
Moulds	√	√		√	√		√	
Dies					√		√	
Gauges, Jigs fixtures		√		√	√		√	
Job work/ Components	√							
Training				√	√		√	√

While the above is the status with respect to the services and markets served by the CTTC, there is no formal need assessment undertaken to estimate the market opportunity for its services. Each year, annual targets are fixed for training and production which are not linked to the market opportunity or desired level of impact. Linking these two parameters will be an advantage in marketing and expanding its services.

Contribution

The breakup of revenue contribution from various services in 2010-11 and break-up of revenue from production related services are given in the Table 5 and Table 6, respectively.

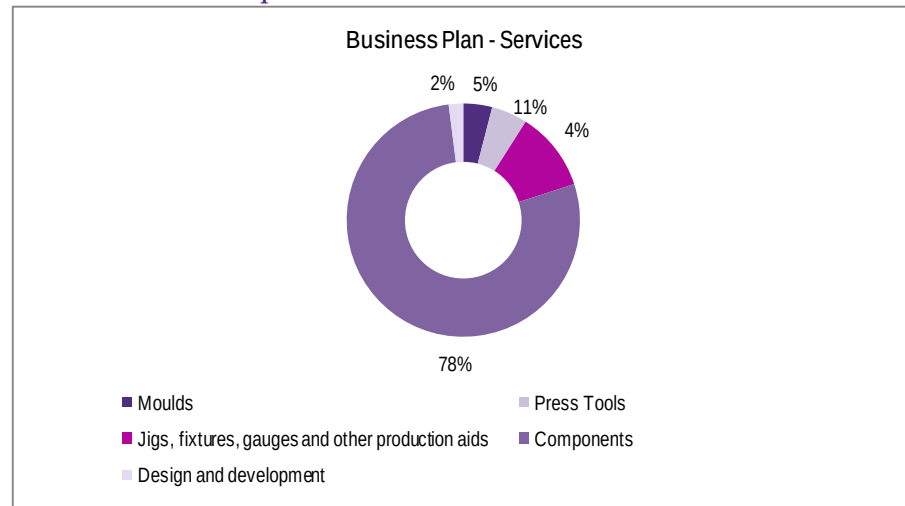
Table 5: Sources of revenue

Activity	Revenue in Rs. In lakhs
Production related services	453.19
Training Programmes	978.37
Others (interest etc)	75.41
Total	1506.97

Table 6: Sector mix of revenue from production of services

Production Service	Percentage of Income
Moulds	4 %
Press Tools	5 %
Jigs, fixtures, gauges and other production aids	11 %
Components	78 %
Design and development	2 %

Figure 2: Revenue mix from production related services



The maximum revenue is generated by training services, which, in 2010-11, has contributed 65% of the total sales realization. In production, average of last 5 years is 78 % from components, 2 percent from design, 5 % from heat treatment and only 15 % from tools. Revenue from training has been rising, 51% in 2005-06 to 65% in FY 2010-11. Maximum revenue of training services is from short term courses. On the other hand 50% of training fees are paid by candidates and balance 50% by Central and the respective State Governments under various schemes such as scheme of reimbursement of fees of SC/ST trainees, ESDP etc.

The industry feedback is very positive. CTTC graduates are considered to have better practical skills as compared to graduates from ITIs or even engineering colleges.

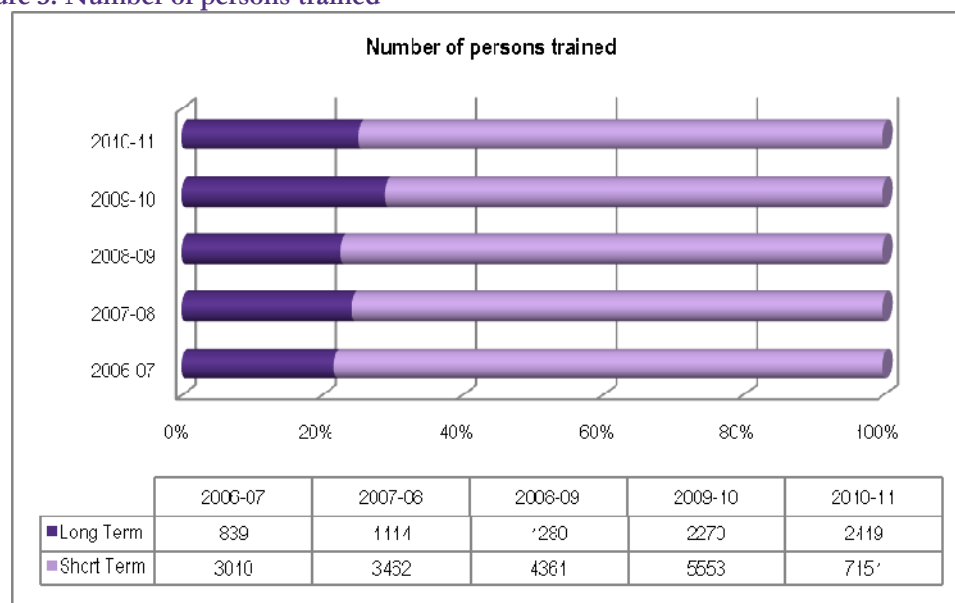
Training

The CTTC Bhubaneswar has a strong reputation in Training. In 2010–2011, it trained 2419 trainees in long-term and 7151 trainees in short-term training programmes. Trend from 2006-07 to 2010-2011 is given in the Figure 3. Trainees in short-term courses have increased in higher proportion than in long-term courses. The trainees for short duration programmes are primarily personnel already working in the Industry and students from the engineering colleges, ITIs or polytechnics who undergo these training courses to improve their practical skills.

CTTC conducts its own test for admission to the long-term course leading to Diploma in Tool & Die making which is recognised by AICTE. The course is popular and has an overwhelming response; number of applicants is 5 times the intake. Admission to other long-term courses is based on admission test when applications exceed the intake capacity, based on marks obtained in examination specified for eligibility criteria or even on first come first served basis. Trend from 2006-07 to 2010-2011 is given in the diagram below.

The training department recovers full costs including depreciation. CTTC does not maintain separate figures for income from short-term and long-term courses but from the number of trainees trained in short-term courses and the fact that such courses generate more revenue for the same inputs, it can be safely said that income from short-term courses exceeds that of long-term courses. Short-term courses are also meant for existing workers in the industry to sharpen their skills, and in that direction, CTTC is making significant contributions towards skill development.

Figure 3: Number of persons trained



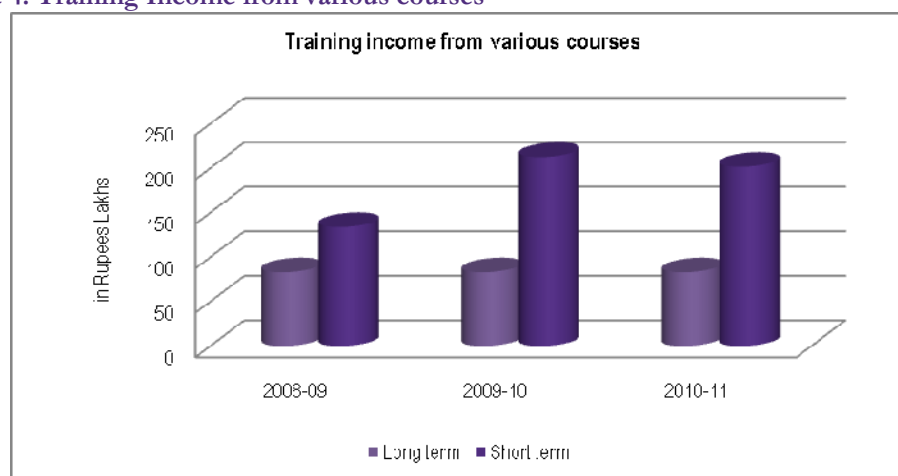
Training Income

Given below is a break-up of the training income received from long term courses, short term courses and condensed courses.

Table 7: Training Income from various courses

Training Courses	2008-09	2009-10	2010-11
Long Term Courses	82.97	82.97	82.97
Short Term Courses	133.81	212.6	201.64

Figure 4: Training Income from various courses



Fee Waiver

No fee is charged from SC/ST students. But their fee is reimbursed by Government of India, MoMSME. Fees from sponsored programmes are paid by sponsoring organisation. In 2010-11 government promoted another scheme with an intake of 25 in each course of duration varying from

100 hours to 300 hours for which fees were duration-dependent and were paid by Government without diluting CTTC's earnings.

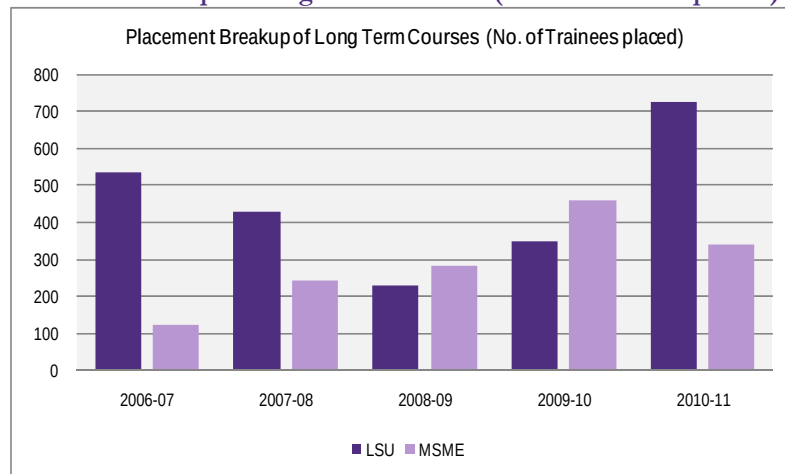
A significant portion of training income is from training schemes financed by the Governments including training of SC/ST trainees. It is encouraging but CTTC should be careful in depending on these schemes in a major way because if a particular scheme is withdrawn it could be difficult for CTTC to make up the loss from open market. The cost for each programme is estimated at the time of commencement of the particular programme but comparison with actual costs is not done. Similarly, cost viz-a-viz fee comparison for each course is not maintained which makes it difficult to ascertain sustainability of individual programmes to weed out the uneconomic ones. Here again, an IT based FMIS would be beneficial.

Placement and Tracking

CTTC has a Placement Cell which arranges placement through campus interviews, sometimes through conferencing. Placement record of long-term courses is given in Figure 4:

Placements are not arranged by the CTTC for short-duration programmes as these are mostly skill up-gradation programmes for persons already employed in the industry, students from engineering colleges & polytechnics during vacations and for industry sponsored courses for their employees. The training department sends placement brochures for its long term courses to various industries. Industry recruits the students by conducting on and off campus interviews. CTTC's website is also useful in this respect.

Figure 5: Placement Break up of Long Term Courses (No. of Trainees placed)



Placement Cell gets feedback from the recruiters regularly. Based on the feed-back, suggestions received are incorporated in the training curriculum to make it –industry-oriented.

Pricing of Services

Tooling and Job Work

The pricing for any tooling job and production is based on the following formula:

$$\text{Cost} = \sum [\text{Machine hour rates} \times \text{Number of hours on the machines}]$$

Quotations are given on cost plus basis keeping the market prices in view, to secure the orders. The bench marks for the purpose are GTTC Bangalore for aerospace components, and IDTR Jamshedpur and CIPET Chennai for tooling.

The Machine hour rates were once fixed taking into account the following components:

- Machine price
- Depreciation
- Electricity
- Consumables
- Maintenance Labour
- Overheads (Salary of Management staff, Maintenance, Administrative staff)
- Contingency
- Margin

Machine hour rates were approved by the Governing Council in 2008 taking into account the above factors. General Manager is now empowered to increase the machine hour rates upto 5 % in a year over the rates in the previous year. He does so keeping market rates in view for which the benchmark used is CIPET and Indo-Danish Tool- Room at Jamshedpur. Prices are quoted keeping in view the market trend. For aerospace components which form a major share of products of Tool-Room, CTTC has to participate in open tenders. CTTC allows 25% discount on machine hour rates to MSMEs. But, according to the users, the rates of CTTC are still higher as compared to those of other private tool-makers.

From FMIS angle, it might be useful if the machine hour rates are revisited with detailed calculations and benchmarked against the market rates.

A suggestion has been made that to promote MSMEs; CTTC should give significant discount to them which should be reimbursed by DC MSME to CTTC like fees of SC/ST trainees. This will be examined collectively for all Tool- Rooms.

Training

The cost for each training programme is estimated at the time of commencement of the particular programme but comparison with actual costs is not available. Similarly, cost viz-a-viz fee comparison for each course is not maintained, which makes it difficult to ascertain sustainability of training division as a separate business product and to weed out the uneconomical ones.

Marketing

System

CTTC has a dedicated marketing team headed by a senior manager for marketing of its tooling services and components. Training is marketed by the Deputy General Manager and respective training officers. Each team is given annual targets which are communicated to the GC as well as DC office. The progress is reviewed on a monthly basis. Both are closely monitored by the General Manager.

Strategy

CTTC participates in exhibitions and trade fairs on a regular basis. The team also sends brochures to various industries and associations. CTTC got its first order in aerospace industry when it participated in an exhibition in Bangalore organised by the Indian Space Research Organisation in 1996. The marketing team makes periodical industrial visits to their regular customers, tap new customers and maintains a mailing list of customers to whom they periodically send promotional brochures and training calendars.

The CTTC has a very effective plan for marketing of its training programmes. In addition to advertising of courses in newspapers, the training department officials make regular visits to engineering colleges and polytechnics as a large number of students from those institutes take specialised courses. It has tapped the demand from the industry and potential to leverage available

infrastructure with ITI, Polytechnics and Engineering colleges in the region. It has a tie-up with IIT Bhubaneswar, where IIT Bhubaneswar students are imparted practical training at CTTC premises. It is geared to professionalise the training service needs of the industry with up-gradation of content, development of an outreach strategy, post-placement tracking of candidates, use of modern training and pedagogical tools, capacity enhancement of trainers, and industry participation.

The CTTC also has a website² but it has not been useful in marketing of the training courses.

Constraints

CTTC, however, does not have a marketing strategy for its tooling division based on market assessment, or any study or survey of market needs and market segmentation which is necessary to contribute more for the development of MSMEs and increase share of tooling. It would be useful for the marketing team to have a strategy which is based on market need assessment and segmentation.

Client Profile

The Central Tool- Room and Training Centre at Bhubaneswar does not have the strategic advantage of being in the midst of concentration of industries which are heavy users of tools, moulds and dies. It has, therefore, to cover wider geographical areas for marketing of tools and dies and to the extent it falls short of securing orders for tools and dies, it makes up with precision components. Management has thus done well in putting the equipment available to optimum use by creating an alternate market. With the industry now coming up in the state of Odisha it is time to concentrate industry of the region, especially MSMEs. With the initiative of the State Government, huge industrial complex is coming up in Balasore. Many steel mills are coming up. Jindals are establishing a cluster park and also a training institute. This will provide increased regional market to CTTC.

CTTC has developed expertise in manufacture of aerospace components (it segments it under defence category as these are for defence aerospace applications) which are equal in complexity and precision, if not more, as tool parts. However this work is of repetitive nature and has the advantage of batch production. It has expertise for design and manufacture of tools but share of tools is present only 15 %. It is presently catering, at low levels, to automobile industry, auto components industry, plastic industry, home appliances industry. All of these sectors have witnessed significant growth in past few years and the trend is likely to continue e.g. auto component sector had CAGR of 28%, plastics 12 % and home appliances grew at 14%. Since the tooling demand grows in the same proportion, these sectors provide a significant market opportunity in the country as a whole. However, regional demand being limited, CTTC has to market its products in other regions.

Table 8: Spread of products, percentages based on values

Products Spread	2006-07	2007-08	2008-09	2009-10	2010-11
Moulds for plastics, metal	2%	2%	2%	3%	2%
Press Tools	5%	5%	5%	5%	5%
Jigs, Fixtures	5%	4%	4%	5%	5%
Components	83%	84%	84%	82%	83%
Others (Heat treatment)	5%	5%	5%	5%	5%

² www.cttcbsr.co.in

Types of Industries Served – MSMEs assisted

The share of MSME customers in numbers has decreased from 74% to 45 % over the past 5 years. In terms of values, MSME share is less than 3 % in 2010-2011, maximum being 4 % in 2006-2007, during the last 5 years.

Admittedly, CTTC is at a disadvantageous position as industries using high value tooling have not come up in the region. Machines are not locally available even for trial of tools. CTTC has to take tools to Kolkata for trials which can be more than once. With state barriers and complex tax procedures, there are problems. It discourages CTTC to opt for tools when there is a healthy market for components. CTTC efforts are laudable in that it has achieved self-sufficiency not only on recurring account but also on full cost recovery including depreciation. But it has potential to assist MSMEs with state-of-the-art machinery, expertise in design and manufacture of tools and a highly dedicated and motivated team of personnel. MSMEs find the quality of tools to be good, deliveries reasonable but prices high for MSME sector even with 25% discount allowed to them.

Since MSMEs requiring high end tooling are practically non existent in the State, the Tool Room constituted two Quality Forums at Bhubaneswar and Rourkela respectively wherein 27-30 Members of MSMEs have been registered with the TR. The Tool Room officials make regular visits to their premises providing free consultancy for improvement of their quality and productivity. Similarly the Tool Room conducts quality/productivity improvement related seminars in various parts of the State like BBSR, Cuttack, Balasore, Berhampur, Rourkela, Angul etc on a regular basis. The programmes are conducted through sponsorship of SIDBI, QCI, NID etc.

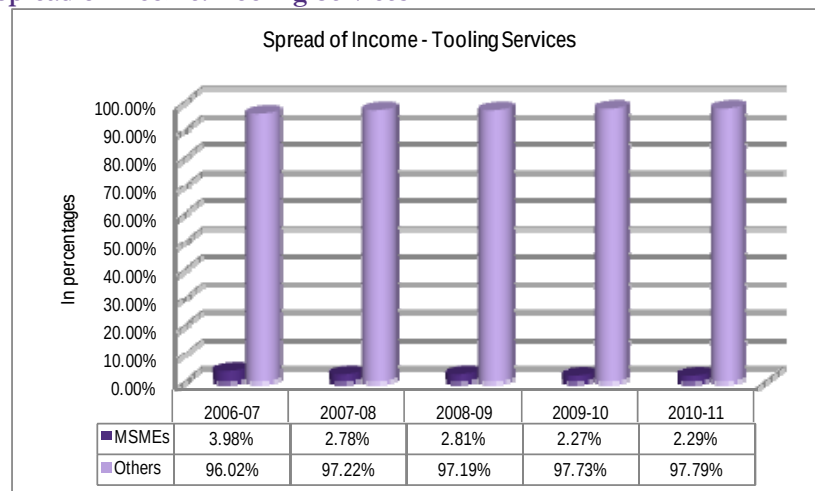
The table below provides trend of share of MSME customers to total customers, in terms of numbers.

Table 9: Industry Break-up in numbers

Type of Industry	2006-07	2007-08	2008-09	2009-10	2010-11
MSMEs	184	172	322	509	375
Large Scale	65	138	130	241	461
Total	249	310	452	750	836
MSME percentage	74 %	55 %	71 %	69 %	45 %

The share of MSMEs and large enterprises in CTTC's revenues is indicated in the bar chart in Figure 6.

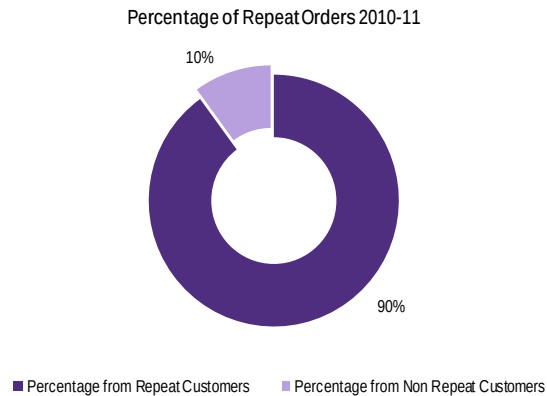
Figure 6: Spread of Income: Tooling Services



Proportion of Repeat Orders

CTTC scores well on customer satisfaction and retention. During the last 5 years around 80 % of CTTC's customers have been repeat customers, the percentage rose to 90 % in 2010-2011 as reflected in Figure 7.

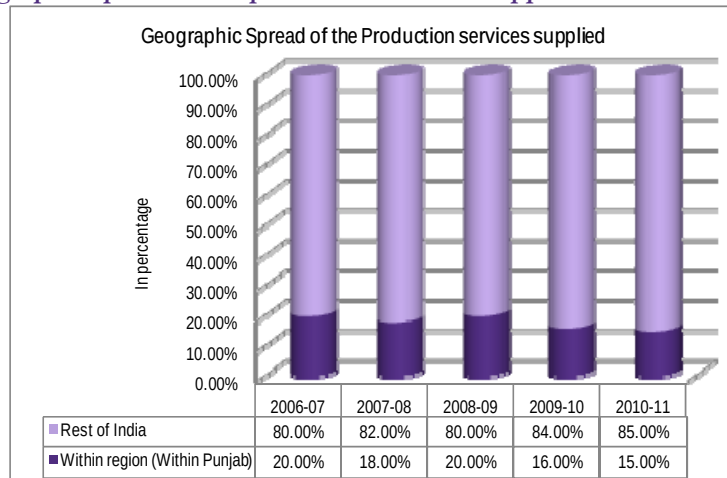
Figure 7: Repeat Order 2010-11



Geographic Spread of the clients for tooling services

As indicated in the chart below, for production related services while majority of the customers are from areas outside the region, in 2010 – 11 it was the lowest with only 15 % of the industries from within the region. Pattern is reflected in Figure 8. This is a cause of concern as CTTC should be able to promote industries of the region.

Figure 8: Geographic spread of the production services supplied



Physical and Technical Infrastructure

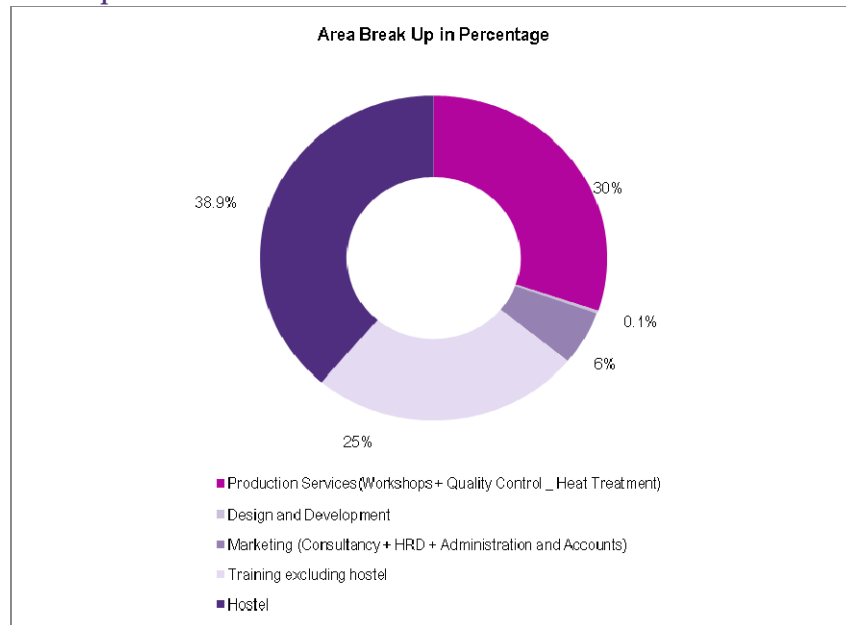
Physical Infrastructure

CTTC is a well-equipped public commercial Tool- Room in the Eastern Region. It is located in the industrial area in Bhubaneswar. The total built up area of CTTC is 11901 square meters. The built up areas for the various departments is given in Table 10 and Figure 9.

Table 10: Facility Break up of CTTC Bhubaneswar

Facility	Area in Square Meters
Production Services(Workshops + Quality Control + Heat Treatment)	3600.00
Design and Development	35.00
Marketing(Consultancy + HRD + Admin and Accounts)	645.00
Training excluding hostel	3000.00
Hostel	4621.00
Total	11901.00

Figure 9: Break-up of infrastructure



Utilities

CTTC is supplied power at high tension by Odisha State Electricity Board. It steps it down and distributes through its own electrical sub-station. All high precision machines are in the air conditioned machine enclosures. It has a clean-room where aerospace components are manufactured as per requirements of its customers. Besides this, CTTC also manufactures submersible pumps and water tanks for water supply system. CTTC has power back up which can feed all the critical equipment in case of power cut by OSEB. Specifications of the backup systems are as below:

Table 11: Power Back up

Capacity	Flexibility for use
Connected Load	500 KVA, they have now applied for increase to 600 KVA
600 KVA DG Set	Can feed whole of CTTC
UPS, 200 KVA	Dedicated to CAD/CAM Hardware and selected CNC precision machines

CTTC depends on outside supplies for welding gases and nitrogen for the Vacuum Heat Treatment. All units of this kind procure these utilities form stockists or agents of such supplies. CTTC has its own arrangements for water supply and generation of compressed air. The utilities like oils, lubricants are locally available and procured appropriately on need basis.

Equipment in Production Related Services Sections;

Under Indo-Danish Technical Co-operation Programme, CTTC was equipped with high-tech equipment needed at that time. Subsequently, the Plant and machinery has been augmented and upgraded from time to time in Production Department.³

Appropriateness of Technology

The available equipment at CTTC has the capacity to meet present majority demands with respect to accuracy, complexity and physical size of tools. It has high end hardware and software for CAD/CAM/CAE.

Discussions with representatives of Tool and Gauge Manufacturers and representatives of industry using the facilities at CTTC indicate that with manufacturing industry growing at fast rates, particularly the automobile and auto component industry, demand for more accurate tooling involving more complex shapes and faster deliveries (due to frequent change of models) is growing. At present CNC metal cutting operations in milling and turning are limited to 3 axes. In view of the likely requirements in future, CTTC should upgrade its infrastructure and have equipment capable of 5 axes machining and high speed milling.

Equipment in the Training Department

Training Department is again well equipped. Equipment includes conventional machines as well as CNC machines of a general engineering workshop.⁴ The department also has typical Tool- Room equipment like:

- CNC Wire EDM Machines
- CNC EDM Machine
- CNC Milling Machine
- CNC Lathe
- CNC Co-ordinate Measuring Machine
- CAD/CAM hardware and software
- VLSI embedded system

Design Development

The Design department plays an important role in the success of a Tool- Room. Its services include product design and tool design before the tools are taken up for production. CTTC has a design office which is well-equipped. Softwares include:

- CAD: AutoCAD, CATIA and high-end design package UG (unigraphics) NX-4, with which it can offer design solutions needed by the industry it is serving.
- CAM: Pro-E / Master CAM, three licenses. Controls of CNC machines are versatile to handle part programming of components.
- SIMULATION SOFTWARE: DNC
- CAD/CAM workstations, Co-ordinate Measuring Machine and CNC Machines are interfaced for reverse engineering solutions and for programming measurement of complex parts. The Tool- Room is using simulation software to check design parameters which, to a large extent,

³ List of high technology machines in Production Department is given in Annexure III.

⁴ List of equipment is given in Annexure IV

reduces after manufacture design problems, improves the percentage of tools successful with less number of trials and thus saves expensive labour which would be otherwise spent on rework or remake of rejected or defective parts. But then, its share of tools in the total output is a small percentage which limits the advantage of this expertise at CTTC.

Besides, as identified by the Tool Room Head, Tool design has under gone sea-change wherein multicolor moulding, multi material moulding, hot runner moulding, fine blanking designing are the order of the day. Unfortunately Tool Room is not equipped to design such type of tools which requires expert tool designing capability. There is only one Designer working in Design Deptt. who has very limited exposure to above mentioned design. Therefore, it has become difficult to serve MSMEs with these design requirements.

However, it is one of the lone TRs to be involved in promoting various NMCP components of DC-MSME such as Lean Manufacturing, Quality Technology Tools, and Design Clinics etc. for the benefit of the MSMEs. At present they are working as consultant of Lean Implementation Scheme of Bhubaneswar Fabrication and Machining Cluster for 11 industries. They have also taken up the Design Workshop of one week duration for Plastic Cluster at Balasore and Cashew Cluster at Brahmagiri in collaboration with NID, Ahmedabad.

Human Resources

In addition to the General Manager, who is the Chief Executive, and the Deputy General Manager, who is the next in command, CTTC has manpower strength of 68 as tabulated below:

Table 12: Personnel

Department / Designation	Senior Manager	Manager	Assistant Manager/ Sr. Engineer/ Sr. Admin Officer	Foreman/ Engineer/ Purchase Officer / Accountant	Master Craftsmen / Technicians Grade I & II	Others
Administration	1	1	2	2		5
Marketing	1	1				
Design			4	3		
Production	1	2	5	6	19	
Training	1	3	6	3		
Sub total	4	7	17	14	19	5
Total	66 (68 including General Manager & Deputy General Manager)					

Manpower mix at CTTC is quite appropriate both with regards to the numbers and the levels. CTTC also employs a large number of operators on contract as and when needed, and at levels needed, which is cheaper as it costs Rs.6,000/- to Rs.10,000/- per month against Rs.20,000/- to Rs.35,000/- which CTTC may have to pay in case of regular employees. This arrangement also provides flexibility to management. A large number of trainees are engaged in production related jobs which contributes to keep manpower costs low and give hands on practice to the trainees.

There are 51 vacant posts, out of which 37 are vacant since inception (1994). Management has adopted an excellent policy to recruit personnel on need basis. Extra posts were not surrendered due to procedural reasons. It is easier to surrender existing post but it is extremely difficult, and involves a long procedure, to get any new post to be sanctioned.

Skill up-gradation /capacity building need

Skill and knowledge development programmes are needed for employees. Apart from acquiring new skills and knowledge, such programmes enhance employees' motivation. CTTC is aware of the

importance of such programmes and deputed its employees to such programmes. All employees have attended development programmes on “Team Work Competency for High Performance” and AS 9100. This explains the formation of a highly motivated team at CTTC.⁵

Retention:

The retention pattern is reflected in the table given below.

Table 13: Retention Pattern

Number of years at CTTC	More than 15	More than 10, up to 15	More than 5, up to 10	Up to 5
Total Number of employees	35	8	12	13

The retention reflected above is because of good HRD policies at CTTC with regard to career. There is no employee at the same post for more than 6 years. There are employees who have been elevated 4 times in a life-span of the project of 20 years.

Incentive Scheme

Tool- Rooms under DC MSME have been allowed to adopt incentive schemes based on the overall guidelines and limits decided centrally by DC MSME. The scheme lays stress on increasing generation of surplus of income over expenditure, 25 % of which is allowed to be distributed to the employees based on the following factors:

- Basic Pay + Grade Pay +Dearness Allowance subject to maximum ceiling on basic pay of Rs.8560/- those with basic pay of more than Rs.8560/- are paid incentive based on Rs.8560/- basic pay (revised after implementation of 6th Pay Commission Recommendations)
- Number of days of attendance in the financial year over the Tool- Room working days.
- There is a maximum ceiling on payment of four months of Basic Pay + Grade Pay +Dearness Allowance subject to maximum ceiling on basic pay of Rs.8560/-
- Contractual employees are also paid incentive based on the number of days they have worked and their wages.

Incentive scheme has motivated all sections of employees which is the force behind improvement in output at CTTC. For the year 2009-10 a sum of Rs.38.64 was paid in the financial year 2010-2011. All employees are covered by the scheme which is a group incentive. Tool- Room work is non-repetitive, hence routing and scheduling differs with every tool part. Ceiling on the amount of incentive payable even after earning more should be removed. Individual incentive scheme is rather difficult and CTTC has adopted the right approach in this regard. Individual incentive scheme can be considered at a later stage when MIS system is developed to the extent that standard machining times can be generated with the help of softwares.

⁵ The details of trainings attended by employees at various levels are given at annexure V:

Operational Efficiency

Lead Time and Quality

CTTC Bhubaneswar is known for the quality of its tooling work. Lead times are also acceptable to industry. They, however, find the price level high for the MSMEs; this is offset to some extent by 25 % discount which CTTC allows to register MSMEs but they still find the prices high.

Odisha Small Industries, with a membership of 1800 units, expressed that while CTTC fulfilled the objectives for which it was set up in the initial years, it has deviated to some extent from the same and is more concerned in increasing the revenues. The association desired that for development of MSMEs in the region, CTTC should provide hand holding support to the MSMEs. It should create awareness among MSMEs regarding advantages of using quality tools which may appear more costly at first but, in fact, be cheaper if cost is amortised over the full quantities it can produce because of the better quality of the tool and better quality of products it manufactures.

Machine Utilisation

Utilisation data for 15 critical machines at CTTC in production related services was examined. The analysis indicates that there is a significant scope for improvement. Ideally, critical machines should be used round the clock. Since Tool- Room operations are non-repetitive and all tool parts need different routing and scheduling, the utilisation target could be 85%. CTTC's position with regards to utilisation of these critical machines is given in Table 11.

Table 14: Machine Utilization

S. No.	Description	Number of hours
1	Installed capacity ⁶	106560.0
2	Hours as per notified shift working	77167
3	Hours machines manned by operators	66247
4	Hours (estimated) jobs booked	57286
5	Actual Hours taken for booked jobs	62940
6	Maintenance Hours	7646
7	Other factors	3274
8	Rework due to faulty machining	3307
9	Rework due to faulty design	0
S. No.	Description	In percentage
10	Utilisation of machines (engaged on production)	59 %
11	Utilisation (booked as per estimates)	54 %

Considering that Tool- Room generally works in two and not three shifts, utilisation is good. But Industry norm is that high value machines should work in three shifts and with that standard, there is scope for improvement. Improvement of capacity utilisation would ease the pricing level as overheads would spread more evenly. Machine hour rates will come down as depreciation and other fixed cost will be spread across a greater number of machine hours.

⁶ Calculation of installed capacity:

Days in a year	=	365
(Less) Sundays	=	(52)
Holidays	=	(17)
Net working days	=	296
Number of Hours on 24x7 basis (296x24) per machine	=	7104
Number of hours on 24X7 basis (296X24 x15) for 15 machines	=	106560

Financial Analysis

Analysis has been done of the performance data for the last five financial years from the CTTC's Annual Reports made available for the following indicators:

1. Net worth
2. Profitability analysis
3. Trend of income and expenditure

Net worth

The net worth of an enterprise is the sum of total equity and retained earnings. Net worth reflects the value of the enterprise, considering it is composed primarily of the money that has been invested in it since its inception, as well as the retained earnings for the duration of its operation.

Net worth of CTTC is shown in the Table 15.

Table 15: Net worth trend over 5 years

Particulars	2005 – 06	2006 - 07	2007 - 08	2008 - 09	2009 -10
Net worth	254,703,589	278,212,969	317,358,896	352,723,067	388,742,254
Year on year increase		9%	14%	11%	10%

The net worth of CTTC, Bhubaneswar has been increasing every year around 10-11%, which is a healthy sign as it implies an increase in equity or value of the Tool- Room. During the years the Tool- Room was also in receipt of government grants

Table 16 reflects the trend of government grants being received by CTTC, Bhubaneswar:

Table 16: Government Grants

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10
Contribution from GOI	35,000,000	35,000,000	30,000,000	30,700,000	30,000,000
Contribution from Govt. of Odisha	-	-	8,000,000	-	-

Net worth of the Tool- Room excluding the government grants received is given in the Table 17. It is now positive even without Government-grants which is laudable.

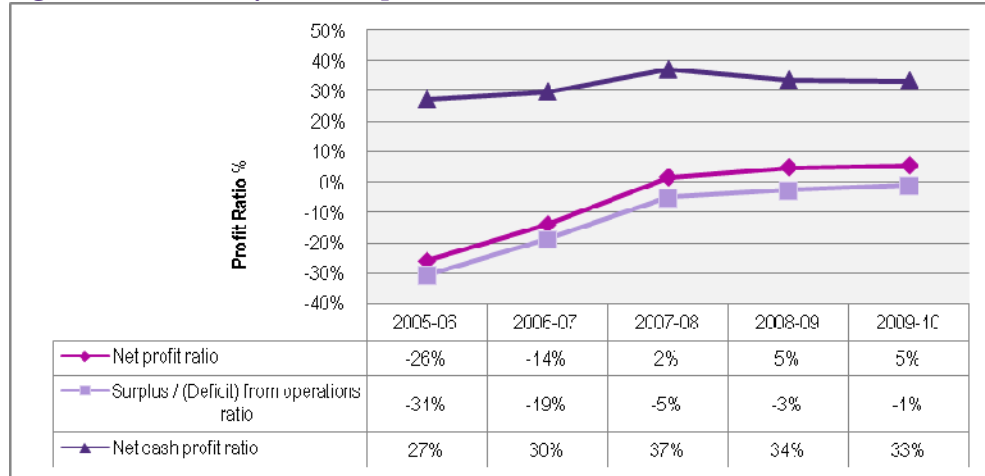
Table 17: Net worth without Government Grants

Particulars	2005 - 06	2006 - 07	2007 - 08	2008 - 09	2009 -10
Net worth excluding government grants	219,703,589	208,212,969	209,358,896	222,023,067	222,042,254
Year on year increase		-5%	1%	6%	3%

The Net worth of the Tool- Room has shown a positive trend even without government grants. Although, the increase is only marginal, the same implies that the Tool- Room is generating enough revenue to sustain its operations.

Profitability analysis

Figure 10: Profitability and Composition



The Tool- Room is incurring a deficit from its operations. Revenue from operations is not sufficient to cover the expenses incurred. The surplus is on account of income from other sources of which the main source is interest income.

The deficit from operations has reduced from 31% in FY 2005-06 to 5% in FY 2007-08, and finally 1% in FY 2009-10. The position of the Tool- Room is improving significantly and at this rate the Tool- Room should be in a position to generate a surplus from its operations in the coming FY 2010-11

The huge difference between net profit and net cash profit is on account of depreciation which is non-cash expenditure. It comprises roughly 35% of the total expenditure.

In FY 2005-06, depreciation constituted the biggest share of total expenditure at 42%, salary costs were 23% and other production and administrative expenses were 35%. However, depreciation share has decreased and salary cost share has increased over the years, with other costs being constant around the 35% mark. In FY 2009-10, depreciation accounted for 30%, salary costs, increased to 36% and other costs were around 34%.

The contribution of income from sale of goods to the total income has decreased continuously from 15% in 2005-06 to 2% in 2009-10. The contribution of income from trainings to total income reduced initially from 51% in 2005-06 to 49% in 2006-07 and 46% in 2007-08. However since 2007-08, the share of training income has increased significantly to 52% in 2008-09 and 65% in 2010-11. Even income from services adds a considerable share to the total income, contributing to around one-third of the total. Rest of the income is coming from sale of scrap, interest income etc.

The income from other sources comprises mainly of interest income, though it's marginal. The increase in the income is on account of increased interest earned by the Tool- Room. The decrease in 2009-10 is on account of low income from change in inventory (Rs.197,939) compared to 2008-09 (Rs.28,03,803).

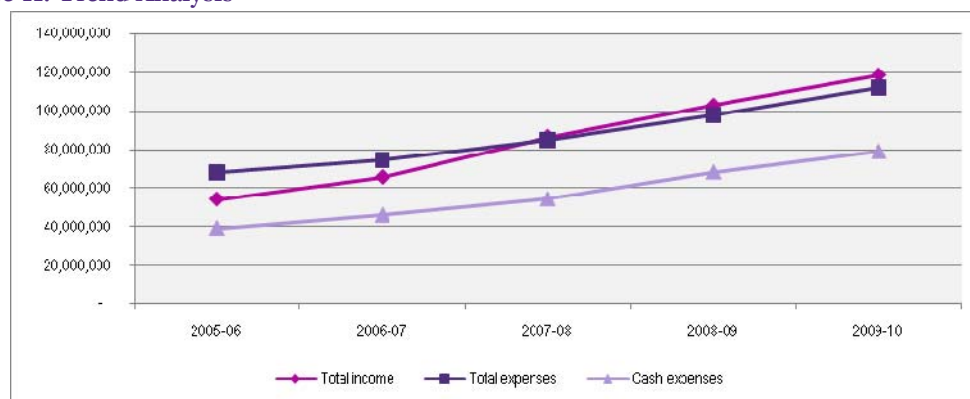
Trend of income and expenditure

Grant Thornton did a trend analysis of the income and expenditure of CTTC, Bhubaneswar based on the audited financial statements provided for the five years ending March 31, 2010. Given below is a diagram reflecting the relationship between the income, expenses and cash expenses:

Table 18: Trend of Income and Expenditure

Particulars	2005 - 06	2006 - 07	2007 - 08	2008 - 09	2009 -10
Total income	54,051,319	65,549,998	86,493,004	102,876,268	118,511,523
Total expenses	68,139,390	74,745,230	85,120,545	97,916,983	112,085,903
Cash expenses	39,190,853	45,932,964	54,275,942	68,212,559	78,942,178

Figure 11: Trend Analysis



The Tool- Room was operating in a deficit in FY 2005-06 and FY 2006-07 but generated a surplus FY 2007-08 onwards and has been positive ever since.

Revenue has grown at an average rate of 22% and the expenses have grown at an average rate of 13%, which is a healthy sign for the Tool- Room. In spite of having a deficit in the initial years, the Tool- Room has had positive cash flows as the income has always been in excess of cash expenses. The cash expenses have been increasing at a faster rate of 19%, compared to those of total expenses which have been increasing at a rate of 13%, but are still less than the rate of increase in revenues of the Tool- Room. Hence, keeping other factors constant and based on the average rates computed, the profitability of the Tool- Room shall only improve with time.

Chapter IV

Overview of Local Business Environment from Tool- Room Perspective

This chapter assesses the location of the Tool- Room and the market potential for it to expand its services. It also analyses the availability of raw material and machinery suppliers in the region.

Location and Market Potential

Central Tool- Room and Training Centre is located in the Chandka Industrial Area, Bhubaneswar, in the state of Odisha. It is well-connected by rail and road. It is on Kolkata – Chennai highway and railway trunk route. Bhubaneswar has its own airport which is well-connected by regular flights to major metropolitans; Bangalore, Delhi, Kolkata and Mumbai. It, however, does not have the strategic advantage of being in the midst of concentration of industries which are heavy users of tools, moulds and dies. It has therefore to cover a wider area for marketing of tools and dies. Owing to locational constraints, the Tool Room falls short miserably in securing orders for tools even locally and has, therefore, gone in a big way for precision components.

The GM shared that tentative figures obtained from MSME DI Cuttack reveals that the high end tooling requirement in the State of Odisha is hardly 30-40 lacs per annum. Under the situation if Tool Room tries to shift its focus to tool production, the TR will practically be idle in Production Deptt. The GM identifies several constraints to tooling production:

- Odisha does not have any Engineering/Automotive industry requiring high end precision tools which can be manufactured by the Tool Room. Although, with the sophisticated machines at their disposal, they can serve to the high end tooling requirements of the industries but the demand is practically non existent in the State of Odisha.
- The industrialisation in Odisha is basically in the Steel and Aluminum extraction sector which do not require any tools. Even the plastic industries in the State of Odisha are basically extruded PVC pipe segment which requires extrusion dies duly chrome plated and basically low end tooling.
- The adjoining states can not be depended for increase in tooling production due to trade barriers like way bills, non availability of die steels inside the State of Odisha and lack of trial facility in Odisha.

Owing to these constraints, the effort to have customers in Tool production from Kolkata such as M/s Alstom, M/s Philips India etc in 1995-96 could not be successful.

In spite of these hurdles and failures the TR has endeavoured and been successful in getting some tooling orders from West Bengal. To meet this constraint, the Tool Room has operationalised a strategy to make at least 20-24 tools annually for the benefit of the learning for the students. The alternative strategy in Production has helped TR to have orders for the next 3 years catering to the high end accurate components for the aerospace sector.

The Supplier Chain

Raw Material Suppliers

Tool Steels used all over the country for making critical parts like cores and cavities of moulds are imported from Germany, Austria, Poland, Japan and Sweden and, for less critical applications, from Taiwan and China. There is a large net work of importers and stockists in the country with major concentration in Mumbai and Chennai. Local stockist in Bhubaneswar can supply limited range of H11, H 13 and D2 die steels, which CTTC buys for about Rs.5 lakhs worth annually. For the rest, it has to depend on Kolkata market; failing this, on Mumbai and Chennai. In case of stocks available locally, the deliveries are prompt whereas for the others, it could take a minimum of two weeks time.

Similarly, stockists and agents of standard mould and die sets, and their components/ parts, have limited local presence in Bhubaneswar but better stocks in Mumbai and Chennai. Some complex parts like heat tubes for hot runner moulds are not made in the country but are imported. These are also arranged by these agents / stockists. CCTC could also import these directly.

Machinery Suppliers

There are two kinds of machines at the CTTC, conventional and precision. The conventional machines are from HMT and other domestic manufacturers. CTTC has the know how to service such machine tools in-house. The other kinds of machine tools are CNC machine tools and other precision machines which are to some extent produced in the country. However, high end machine tools of this category are imported mainly from Switzerland and Germany and lately also from China where less accuracy and versatility are acceptable. A few of these machine manufacturers have liaison representatives based in Bhubaneswar which offer an advantage in liaison with zonal offices and headquarters in Kolkata in Mumbai, Bangalore, Delhi and Chennai for enquiries, servicing and attending to break downs.

Summary of Backward Linkages

Summary of backward linkages is given in Table 19

Table 19: Backward Linkages

Input	Linkage/ Sources
Raw Materials	Limited stockists in Bhubaneswar. Major stockists/importers of alloy tool steels are located in Mumbai and Chennai.
Machine Tools	Manufacturers for indigenous machines. Direct imports for imported machines, nearly all such suppliers have agents in India for liaison and service back up.
Standard Moulds and Die sets	Manufacturers or stockists, mostly outside Bhubaneswar. Some complex parts like hot tubes for hot runners etc are imported but stocked by stockists and traders.
Cutting Tools	Manufacturers and stockists sufficiently present in Bhubaneswar
Consumables like oils, greases, salts	Stockists in Bhubaneswar
Spares	From OEMs except for standard spares like bearings which are available locally to some extent and from stockists in Kolkata.
Specialised Maintenance/ Servicing of CNC Machines	By the machinery suppliers. In case of imported machines, this is provided by agents of the foreign suppliers through annual Maintenance Contracts which tend to be expensive or on visit basis which is preferred by CTTC. Service agents are based at the headquarters of the agent and arranged on need basis. Agents of a few foreign principals / suppliers have their branch

	offices or liaison offices in Bhubaneswar which is an advantage for close liaison with service engineers and cuts down time for attending to the break down

Chapter V

Inclusive Growth underlined by Social Impact

CTTC has made impact in all the three areas of training, production and dissemination of environmentally friendly technologies.

CTTC trained 2419 trainees in long term courses and 7151 trainees in short term courses in 2010-2011 and it aims to increase this figure to 10000 next year per annum under various training programmes resulting in employment generation. Since majority of these trainees are from the region as mentioned above, it is a great booster to which CTTC is contributing socially.

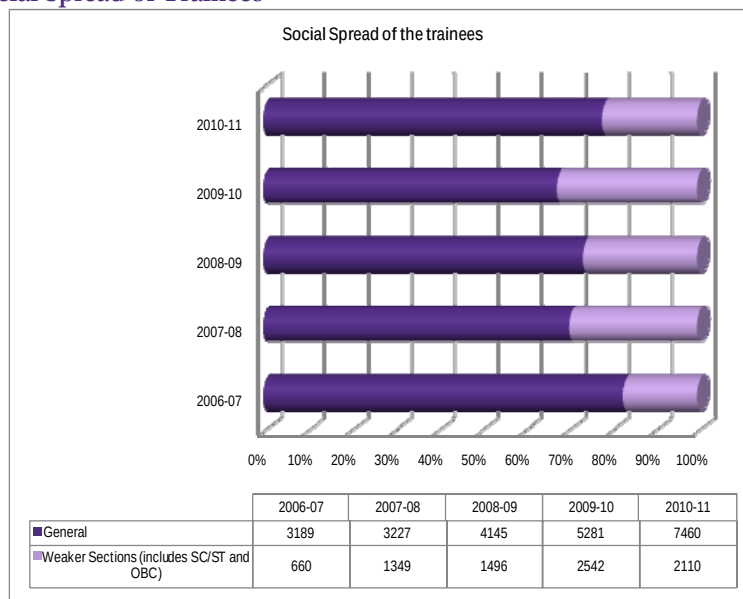
Environment

It has changed the way heat treatment was done in the region by adopting state of the art electricity powered vacuum heat treatment furnaces which are environment friendly. No toxic wastes are created as is the case with salt baths and oil fired muffle furnaces. The whole process takes place in closed chamber under vacuum.

Social Spread of Trainees

Social spread of trainees at CTTC Bhubaneswar is reflected in the Figure 11:

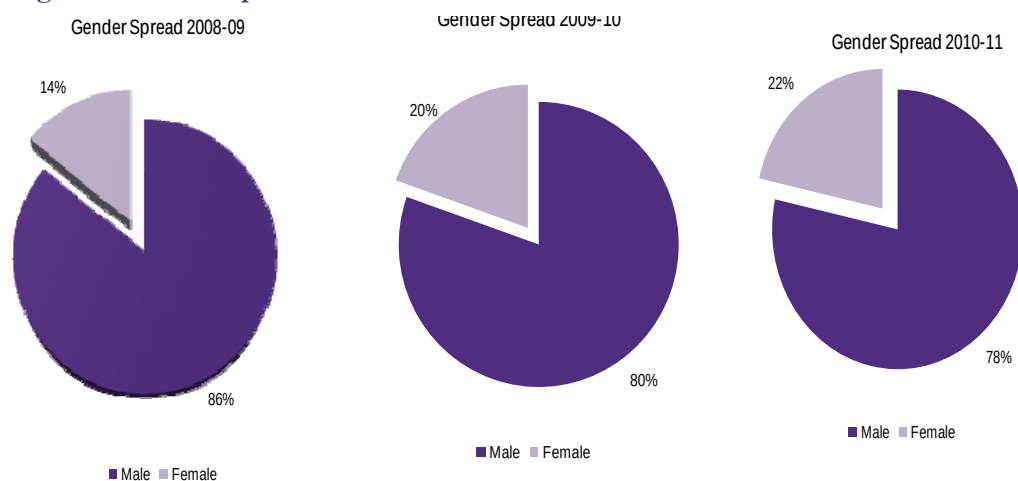
Figure 12: Social Spread of Trainees



Gender Spread

Given below is the gender spread in the Tool- Room for its long and short term courses for the last three years. Keeping in view that most of the training courses run by CTTC are for industry where women participation is less, representation of women in its training programmes is good. No special incentive is provided to encourage women to participate in the trainings. Trend in the last three years is given in Figure

Figure 13: Gender Spread



SWOT

Strengths

- CTTC is the most well equipped commercial Tool Room in the Region
- It is set up with development objectives and offers its services without commercial objectives
- It has dedicated and motivated team of officers and staff
- It has expertise in manufacture of accurate and complex components needed by aerospace industry and research and development organisation
- It has earned great reputation for its training expertise and training programmes
- It has developed good design capabilities for design of tools
- It does not depend on Government for grants

Weaknesses

- Utilisation of machine capacity even in critical areas is about 59%.
- Price of tools is high for MSMEs
- CTTC does not have independence to adopt its own incentive scheme. It has to follow the scheme centrally drawn for all Tool Rooms which has ceiling on the maximum incentive which can be paid even if more has been earned.
- Emphasis has shifted away from hand holding of MSMEs through tooling services

Opportunities

- CTTC holds good reputation with Industry for its expertise
- Significant scope for scaling up training and tooling services given the favourable market conditions
- Abundant demand for tools from plastic industry in which CTTC has expertise. It forms 38% of the total tooling demand.
- Huge national requirement of trained manpower
- Government support for capital investment is available

Threats

- Monitoring based only on indicators of self sustainability has diluted impact on MSMEs.
- Easy procedures and low customs duties for import of tools. TAGMA's latest survey indicates that 31 % tools were imported in the country in 2010-11.
- Low price levels and faster deliveries of tools from some countries, especially China.
- MSMEs prefer low costs of tools.

Conclusion

When the Tool Room was established in the year 1991-92, it was thought that this Tool Room is a white elephant and will be closed soon because there was no tooling requirement and industrial development (tool related in the State), as is shared by the GM. This has been personally experienced by the GM who was the Head of Marketing as well as Production for a long period from 1995-2004. But due to their innovative strategies and commitment/ hard work, the Team has been able to turn around TR performance and turn constraints into opportunities. This is among one of the most productive MSME Tool Rooms- in terms of profitability, trainees trained and services to MSMEs.

CTTC has made significant progress and impact in creating skilled manpower and producing precision components. It has contributed to inclusive growth in mainstreaming the weaker sections and empowerment of women. Infrastructure and equipment is well maintained. It has also made significant progress in financial self-sustainability. It is now recovering full costs including depreciation and going beyond it. Over the years, however, there is a shift from promotion of MSMEs and tool production to component production which is good for gap filling but should not be the main thrust.

The policy direction and monitoring indicators gives weightage to self sustainability which needs to be revisited as the impact on MSMEs is of equal significance. Over emphasis on cost recovery and related financial indicators has resulted in reduced impact on the MSMEs. It is also necessary that the CTTC develops an understanding of the current and emerging MSME needs, especially local clusters. A formal survey of the MSME market relevant to the CTTC is needed for this purpose. This would be essential to establish short and long term targets with an eye on the impact.

Annexure I

Details of visits

Details of visit of GT Team to CTTC Bhubaneswar

Date of the Meeting	Name of the City	Details of Meetings	List of People Met	Designation
16 June 2011	Bhubaneswar	CTTC Bhubaneswar	Mr. S. Maity	General Manager
16 June 2011	Bhubaneswar	CTTC Bhubaneswar	Mr. L Rajasekhar	Dy. General Manager
16 June 2011	Bhubaneswar	CTTC Bhubaneswar	Mr. B Paty	Senior Manager (Admin & Accts.)
16 June 2011	Bhubaneswar	CTTC Bhubaneswar	Mr. K. C. Mishra	Manager (Admin & Accts.)
17 June 2011	Bhubaneswar	O.P. Jindal Community College	Mr. P.W. Singh	Principal
17 June 2011	Bhubaneswar	Jindal Industrial Park(Potential User of CTTC, Bhubaneswar)	Mr. Bibhu Prasad Mishra	Director
17 June 2011	Bhubaneswar	Jindal Steel and Power Ltd. (Potential User of CTTC, Bhubaneswar)	Mr. Vikas Goel	General Manager-Plate Mill
17 June 2011	Bhubaneswar	Odisha Small Scale Industries Association	Mr. Nishikant Mishra	President
17 June 2011	Bhubaneswar	Khandagiri Pulp Pvt. Ltd.(User of CTTC, Bhubaneswar)	Mr. Sailendra	Director
17 June 2011	Bhubaneswar	Kalinga Stock Deal(Raw material Supplier)	Mr. BK Agrawal	Director

Annexure II

Training Courses

Course	Duration	Fee/student	Support from Ministry of MSME/Others (State etc.)	Intake	Selection Criterion	Certification by	Typical job on placement	Soft Skills	Entry Level Salary and Growth
Long Term									
Diploma in Tool & Die Making	4 years	30,000 P.A.	Fees for SC/ST reimbursed by GOI.	60 Nos.	Entrance Examination	CTTC	Automobile	Yes	7000 during placement training
ITI Machinist	2 years	20000 P.A.	-do-	24	Mark basis	-do-	-	-do-	5000/-
Condensed Certificate Course in Tool & Die Making	1 year	60,000/-	-do-	20	First come first serve basis	-do-	-	-do-	5000/-
Certificate Course in Basic Machining	1 year	22000/-	-do-	60	-do-	-do-	-	-do-	5000/-
Certificate Course in Tool- Room Machinist	1 year	20,000/-	-do-	24	-do-	-do-	-		5000/-
Certificate Course in	1 year	15000/-	-Nil-	20	Entrance	CTTC	-	No	4500/-

Course	Duration	Fee/student	Support from Ministry of MSME/Others (State etc.)	Intake	Selection Criterion	Certification by	Typical job on placement	Soft Skills	Entry Level Salary and Growth
Machine Operation					Exam.				
Post Diploma in CAD/CAM	1 year	42000/-	-do-	30	First come first serve	-do-	-	Yes	9000/-
Post Diploma in Tool Design & Mfg.	1 year	48,000/-	-do-	60	-do-	-do-	-	-do-	9000/-
Post Diploma in Computer Aided & Manufacturing	1 year	48,000/-	-do-	12	-do-	-do-	-	-do-	9000/-
Post Graduate in Tool Engineering CAD/CAM	1 year	60,000/-	-do-	30	-do-	-do-	-	-	9000/-
Certificate Course in Advance Machining	1 year	24000/-	-do-	60	Mark basis	-do-	-	No	6000/-
Certificate Course in Advance Machine Maintenance	1 year	21,000/-	Nil	25	Mark basis	CTTC	-	No	6000/-
Certificate Course in CNC Machining	1 year	24000/-	-do-	30	First come first serve basis	-do-	-	Yes	6000/-
Certificate Course in CNC Programming & Practice	1 year	32000/-	-do-	30	-do-	-do-	-	-do-	9000/-
Certificate Course in Computer Aided Engineering	1 year	22000/-	-do-	12	-do-	-do-	-	-do-	7000/-
Short Term									
Auto CAD	1 Month	5500/-	-do-	30	-do-	-do-	No Placement	No	-

Course	Duration	Fee/student	Support from Ministry of MSME/Others (State etc.)	Intake	Selection Criterion	Certification by	Typical job on placement	Soft Skills	Entry Level Salary and Growth
PRO-Engineer	1 Month	6500/-	-do-	30	-do-	-do-	-	-do-	-
Master CAM	1 Month	6000/-	-do-	30	-do-	-do-	-	-do-	-
Hypermesh	1 Month	6500/-	-do-	30	-do-	-do-	-	-do-	-
ANSYS	2 Weeks	5500/-	-do-	30	-do-	-do-	-	-do-	-
Unigraphics	1 Month	6500/-	-do-	30	-do-	-do-	-	-do-	-
CATIA	1 Month	6500/-	-do-	30	-do-	-do-	-	-do-	-
PRO-E Manufacturing	5 weeks	7000/-	Nil	30	First come first serve	CTTC	-	-do-	-
VLSI	1 Month	6500/-	-do-	30	-do-	-do-	-	-do-	-
Industrial Automation	1 Month	6500/-	-do-	30	-do-	-do-	-	-do-	-
STAAD Pro	1 Month	5500/-	-do-	30	-do-	-do-	-	-do-	-
Hardware & Networking	1 Month	4000/-	-do-	30	-do-	-do-	-	-do-	-
Hydraulics & Pneumatics	1 Month	6500/-	-do-	30	-do-	-do-	-	-do-	-
Laptop Maintenance	1 Month	5000/-	-do-	30	-do-	-do-	-	-do-	-
Advance Embedded System	1 Month	7000/-	-do-	30	-do-	-do-	-	-do-	-

Annexure III

Production Equipment

High Technology equipment in production related services						Year of Installation
CNC Machines	Type	Make/Model	Max Job Wt	Axes	Accuracy	
CNC	Lathe	MAZAK- QT 15N	Max. Cutting dia = 254mm Max. work Length = 350mm Distance between centre = 500mm	02	10 Micron	1995
CNC	-Do-	ACE DESIGNER-Turn	Max. Cutting dia = 250mm Max.Longitudinal Travel = 350mm Distance between centre = 425mm	02	10 Micron	9/3 2009
CNC	-Do-	MAZAK-Nexus 100	Standard machining dia – 185mm Max. Machining dia – 280mm Max working length – 320mm Distance Between centre – 430mm	2	5 Micron	Sep 2003
CNC	-Do-	SCHUBLIN-CCN 125	Standard machining dia - 115mm Max. machining dia – 200mm Max. working length – 255mm Distance between centre – 325mm	2	2 Micron	Nov 2003
CNC	Milling	SCHUBLIN-WF 32C	Travel in x*y*z=600*600*450mm Table size =520*800mm	3	5 Micron	1995
CNC	Milling	SCHUBLIN-WF 31DE	Travel in x*y*z=560*500*400mm Table size =460*800mm	3	5 Micron	1995

High Technology equipment in production related services						Year of Installation
CNC Machines	Type	Make/Model	Max Job Wt	Axes	Accuracy	
CNC	Vertical Milling Machine	BRIDGEPORT UK- VMC 2216 XV	Travel in x*y*z = 560*406*508mm Table size = 915*356mm	3	5 Micron	2003
CNC	Vertical Boring & Milling Machine	BFW- BMV- 40	Travel in x*y*z = 510*410*460mm Table size = 400X710mm Max. safe load on table = 400kg	3	5 Micron	2003
CNC	Vertical Machining Centre	BFW- AGNI	Spindle Speed- 6000Max Programming feed Rate-1- 1000mm/min Rapid Travec yx- 24m/min Rapid Travel- 15m/min Axis Trv-x- 600mm, y- 450mm, z-500mm	3	5 Micron	2008
CNC	Wire EDM	BFW- AGIECUT 220	Max. work dim in 1*w*h=860*580*250mm Max travel in x*y*z=400*250*250mm Max. work piece weight =400kg.	5 axis	10 MM	1995
CNC	Wire EDM	ELECTRONICA- MAXICUT 334	Work size max 1*w*h=500*400*150mm Max travel in x*y*z=400*300*150mm Max. work piece weight =235kg.	5 Axis	20MM	1995
CNC	Wire EDM	AGIE- AGIE Progress	Max. Work Dim 700X450X250 Max travel in XYZ=350X250X250 UV +/- 70 Max work pie weight 400kg	5 axis	2MM	2004
CNC	Die Sinking(EDM)	AGIE- AGIETRON 250C	Max. work dim in 1*w*h=1000*700*320mm Max travel in x*y*z=700*500*500mm Max. work piece weight =1200kg.	4 axis	5 MM	1995
DRO	Surface	JACOBSEN-	Max Work	03	05 MM	1995

High Technology equipment in production related services						Year of Installation
CNC Machines	Type	Make/Model	Max Job Wt	Axes	Accuracy	
	Grinding	1832	Dim(800X550X450mm)			
DRO	Surface Grinding	JACOBSEN-1026	Max Work Dim(490X400X300mm)	03	05 MM	1995
CAM	Package	Version/licenses	Vendor	Brief Description		
Pro-E/Master CAM	Mfg.	Master CAM x3	Onward Technology	Mfg.Software 1 No.		
CAD	Package	Version/licenses	Vendor	Brief Description		
AutoCAD	Drafting	2010	KLK Calcutta	Drafting-1 No.		
CATIA						
UG	Mfg.	NX-4	Tata Consultancy	Molelig Mfg.soft.-1NO.		
Simulation Software	DNC		Orbit Calcutta	For linkage CAD/CAM		5 NO.

Annexure IV

Training Equipment

High Technology equipment in Training Department							
CNC M/cs	Type	Make/Model	Max Job Wt / Specifications	Axes/Travel	Hourly Rate ⁷	Accuracy	Year of Installation
	Milling Machine	- PEDERSEN- VPU-900 - HMT- FN IV	1040X 305	700x300x455 1000x490x540 590x270x390	-	0.05 mm	1993
		- BFW- VF -1 - ZIGMA- HORIZONTAL 80SHI	1000x230	1076x470 x456			2008
		SIGMA- SVI- 164					2005
							2005
	Lathe Machine	- VIKRAM- HMT' GH1 2 - JYOTI- (PIONEER)175	- VIKRAM-Ø390X 750 - JYOTI-Ø360X	750x390 1000x340	-	0.05mm	1991
							2000

⁷ Assumptions for calculation of Hourly rate
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High Technology equipment in Training Department							
CNC M/cs	Type	Make/Model	Max Job Wt / Specifications	Axes/Travel	Hourly Rate ⁷	Accuracy	Year of Installation
		- GEDEE-CONDOR - KIRLOSKAR-ENTERPISE 355 - PADMINI	1000 • KIRLOSKAR-Ø350X800 MM	1000x1840 di350x800 x400 z720 dia 300		0.02m 0.02	1995 1995 2005
	Shaper	MMM LOYAL	LS -1	500x350x650	-	-	1991
	Pedestal Drilling M/C	EFCO S- Iddapura	PS/25/GTA/20 CTG		-	-	1992
	Bench Drilling M/C	EFCO	BOM/HD		-	-	1992
	Pedestal Grinding	KEF-1036246	3000/3600r/Min		-	-	1991
	Single Lip Cutter Gr				-	-	
	Lapwet Grinding M/C	HMT- HMTCCCTL 175	40X40	L 1.08 W 1.13 H. 1.62	-	-	1993
	Surface Grinder	- JAKOBSEN-JAKOBSEN (618) - JAKOBSEN-JAKOBSEN (1026) - BHURJI- A51 - PRAGA TOOLS-PSG 500 - HMT	Maxm Load 250 KG Capacity 650x300MM 250kg 650x300	450x200x236 620x470x350			1995

High Technology equipment in Training Department							Year of Installation
CNC M/cs	Type	Make/Model	Max Job Wt / Specifications	Axes/Travel	Hourly Rate ⁷	Accuracy	Year of Installation
							2011
	Tool & Cutter Grinder	- PEDERSEN- PEDERSEN (VSL) - HMT	920X 140MM				1993
	Cylindrical Grinder	HMT- K130/500V	Ø250X250MM		700x375	300	1993
	- CNC Milling m/c (1) - CNC Milling m/c (2)	BFW- VF-30 BFW(SIEMENS)- CHANDRA- BMV45	525X415X450				2007 2008
	CNC Milling (FANUC)	AMS- AMV- 400	525X415X450				2000
	CNC Lathe(Siemens)	AMS- JOBERXL AMS- JOBERXL & LT- 16	525X415X45 525x415x45				2003 2005
	EDM	ELECTRONICA- EMS - 5535	550X350X250				
	CNC 3D Measuring m/c	ACCURATE- SPECTRA	400X600X50				2003
	PLC	SIEMENS					2008
	VLSI with embedded system	SIEMENS	S7/400/300				2009
	Computers	HCL IV HCL dual core Core & Duo HCL 13	264 Nos 180 Nos 252 Nos 123 Nos.				

High Technology equipment in Training Department							
CNC M/cs	Type	Make/Model	Max Job Wt / Specifications	Axes/Travel	Hourly Rate ⁷	Accuracy	Year of Installation

Annexure V

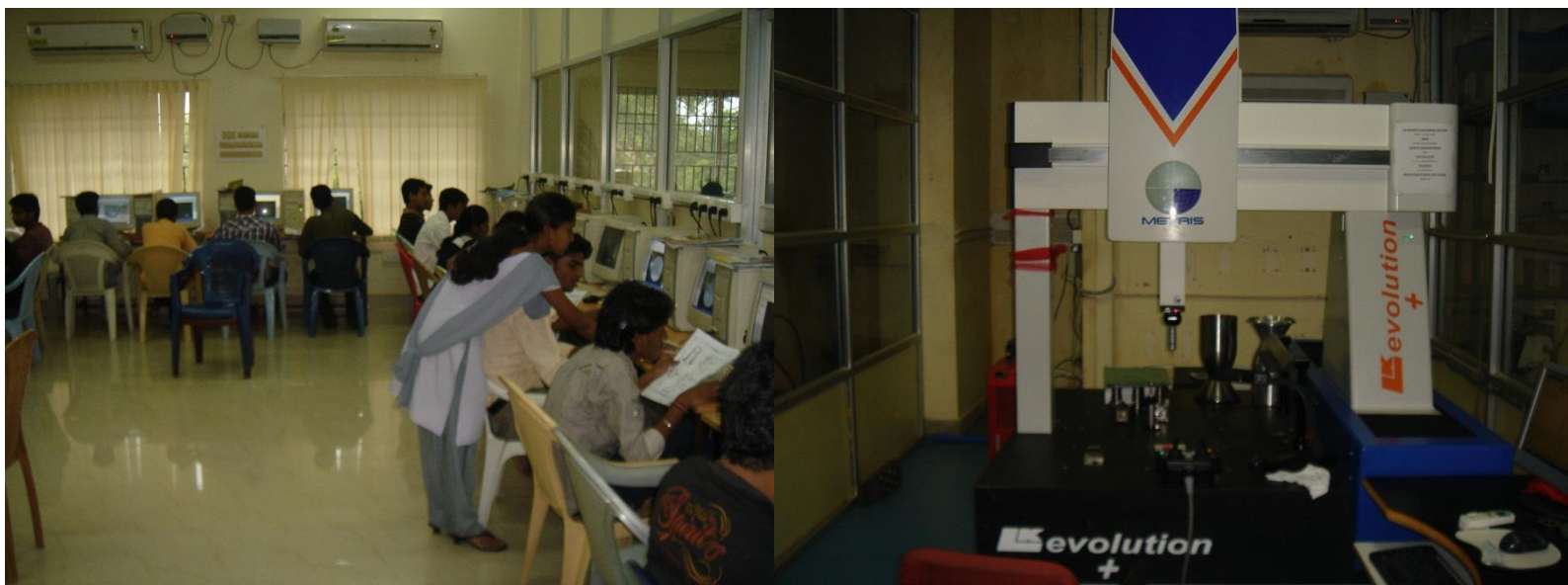
Training of Personnel

Sl. No.	Designation	Number	Subject
1	Manager Training	1	Operation of CNC Machines and Programming with CAD/CAM
2	Assistant Manager Training	2	
3	Assistant Manager Production	1	
4	Assistant Manager Design	1	
5	Assistant Manager Heat Treatment	1	
6	Design Assistant Grade I	1	Computer Aided Design
7	Design Assistant Grade II	1	
8	Technicians Grade I	22	Operation of CNC Machines
9	Technicians Grade II	15	
10	Technicians Grade III	20	



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Strategic Assessment of MSME Tool Rooms

As Is Assessment Report – TRTC Guwahati

Prepared for

**Micro, Small and Medium Enterprises
Umbrella Programme**



Knowledge Partner:



Grant Thornton

Contents

	Page
Abbreviations used	5
Executive Summary	7
Introduction	10
Chapter I - Organisational Profile	12
Chapter II - Governance, Management Systems and Processes	14
Chapter III - Organisational Assessment	18
Chapter IV - Overview of Local Business Environment from Tool Room Perspective	32
SWOT	36
Conclusion	37
Annexure I - Details of Visit	38
Annexure II - List of Short Term Courses	39
Annexure III - Training Equipment	40

Figure 1: Share of Services	19
Figure 2: Number of Trainees trained.....	20
Figure 3: Training Income from various courses	21
Figure 4: Spread of Income – Job Work Services	24
Figure 5: Repeat Orders 2010 - 11	24
Figure 6: Geographic Spread of the Production services supplied.....	25
Figure 7: Profitability and Composition.....	30
Figure 8: Trend Analysis.....	31
Figure 9 : Social Spread of Trainees	34
Table 1: Brief Profile.....	12
Table 2: Annual Targets.....	15
Table 3: Service Mix of TRTC Guwahati	18
Table 4: Service - Sector Mix of TRTC Guwahati	19
Table 5: Break-up of Revenue Contribution.....	19
Table 6: Spread of products, percentages based on values	23
Table 7: Industry Break up of TRTC Guwahati.....	24
Table 8: Facility Break up of TRTC Guwahati	25
Table 9: Power Back up.....	26
Table 10: Personnel	27
Table 11: Net worth Table	29
Table 12: Grants received by TRTC, Guwahati	29
Table 13: Net worth excluding grants	29
Table 14: Backward Linkages	33

Abbreviations used

CAGR	Compound Annual Growth Rate
TRTC	Tool Room and Training Centre
CAD	Computer Aided Design
CNC	Computer Numerical Control
CAM	Computer Aided Manufacturing
D	Dimensional
DC	Development Commissioner
DG	Diesel Generating
DONER	Department of North Eastern Region
EDM	Electric Discharge Machining
FMIS	Financial & Management Information System
FY	Financial Year
GFR	General Financial Regulations
GC	Governing Council
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GOI	Government of India
HOD	Head of Department
HRD	Human Resource Development
ISO	International Standards Organisation
IT	Information Technology
ITI	Industrial Training Institute
L 1	First Lowest
M/C	Machine
MIS	Management Information System
MoMSME	Ministry of Micro, Small and Medium Enterprises
MSME	Micro, Small and Medium Enterprises
NTTF	Nettur Technical Training Foundation
OEM	Original Equipment Manufacturers
PG	Post Graduate
PM	Project Manager
SOP	Standard Operating Procedure

Executive Summary

The Tool Room & Training Centre at Guwahati was set up by Government of India, with assistance from Government of Assam for manufacture of tools and training of manpower in employable skills in tool making and allied trades. It is operating as Government of India Society under Chairmanship of DC MSME since 2002. The activities at Amingaon premises started partially from January 2004 and full-fledged operations started from October 2007. The total investment in the project was Rs 22.08 Crores of which Governments of India and Assam government contributed Rs 18.10 Crores and Rs. 3.98 Crores respectively. Equipment installed at TRTC includes tool-room machines like CNC milling machine, CNC wire EDM machine, surface grinder, cylindrical grinder etc. However, the project is not able to progress as intended at the planning stage.

Over the years, TRTCs revenue has increased at an average rate of 23% over the last 4 years. Cash expenses during the same period increased at 47%, signifying that the gap between income and expenditure continued growing. The TRTC revenue excluding the Government grant is still negative. Government grant-in-aid of Rs 29,500,000 was given to meet recurring expenses of TRTC. The deficit is on account of depreciation averaging 42% in the five years FY 2005-10. Salary costs accounted for around 39% of the total expenses in FY 2005-06, but have reduced since then, and in FY 2009-10, the same accounted for only 23% of the total expenses.

TRTC's operating income and expenditure without depreciation in recent years was as below:

Rs. in lakhs

	2005-06	2006-07	2007-08	2008-09	2009-10
Total income	21.37	36.12	51.50	87.13	120.04
Recurring expenses	21.37	36.12	51.50	73.68	97.32
Income minus expenditure	0.00	0.00	0.00	13.45	22.71

The contribution of income from training fees and subscriptions has grown significantly over the years from 27% in FY 2005-06 to 82% in FY 2009-10, down to 74% in 2010-11. Unlike other Tool Rooms, there is no revenue from tool production services. Income shown above includes Rs.6.81 lakhs from job work. In 2010-11, TRTC trained 1103 trainees in its training programmes.

TRTC at present contains only a skeleton of the staff that should exist at the Tool Room, which includes the Project Manager and 8 other staff. It clearly needs to expand in terms of human resources and the capacity of manpower. TRTC faces great difficulty in recruiting and retaining manpower. Hence to retain manpower, it could train them, provide performance based incentives, reward and motivate employees who stay for long years with the Institute by promoting retention schemes and loyalty benefits (such as retention bonus etc). These schemes not only will enable the

Tool Room to retain manpower but also attract new talent to join TRTC as a lucrative career option. In addition, it is also required to train the employees in various technical as well as managerial aspects so that they can be promoted and can attain higher positions.

TRTC's objectives were to assist MSMEs of the northern region to enhance their competitiveness by providing to them high quality tools, common facilities in machining and heat treatment, consultancy to increase the quality and productivity of their products, training young men for the industry and to sharpen skills of existing employees from the industry. TRTC's core strength has been training skilled manpower for the MSME units. For sometime now, stress has been more on cost recovery for which targets are fixed but incentive to keep targets based on assistance to MSMEs and outreach and impact has been low. All units assisted with job work are MSMEs but the level of this activity is low, only 6% revenue is from this service. Micro and small units find TRTC's price level beyond their reach and delivery periods long. In an effort to keep costs low, and dearth of trained manpower in the region, vacancies at position of heads of the departments and other supporting positions in Production and Training have not been filled and these crucial departments are being managed by Technicians who are unable to command at intended levels. This is coupled with problem of availability of skilled personnel in market to recruit on these positions

Some of the key challenges, constraints and solutions are enumerated below:

<u>Division/ function/ process</u>	<u>Challenge/constraints</u>	<u>Key solutions /ideas</u>
Policy goals and direction	Outlined policy goal for setting up of TRTC is to enhance the competitiveness of MSME through supply of tooling services and skilled manpower. However, monitoring of performance is mainly on financial parameters and not so much on outreach and impact.	A balanced approach needs to be synthesised so that assistance to MSMEs is not lost sight of while aiming for self sufficiency
Autonomy of Institution	TRTC is set up as an autonomous society but is still to a large extent guided by Government policies. The decision making body, Governing Council meets once in a year on an average	Setting up one central society under DC MSME to administer all Tool Rooms would be examined while consolidating management issues for all 10 Tool Rooms
Core Management Team	Motivation in the core management team of Project Manager and the next line of Heads of the Departments.	Career improvement issues should be redressed. If required vacancies at lower levels could be kept vacant instead of those at higher levels
Management Systems	Post placement tracking of trainees is not undertaken	Design of IT enabled Financial and Management Information System (FMIS) is a required.
Networking with other Tool Rooms, institutions and alumni	There is no networking with other Tool Rooms/institutions except GMs meetings which are usually once in a year. The Tool Room does not leverage the network of its alumni to enhance its tool design and production.	Networking with other Tool Rooms under MoMSME, also at Heads of Departments level would be useful. Again IT enabled platform networking and with alumni is essential.

Pricing of services	The machine hour rates were approved by the Project Manager in the year 2007. Industry finds prices high	Machine hour rates should be re-examined with detailed analysis.
Lack of expertise	TRTC does not carry out any tooling and designing activities. It does carry out job work which does not have any significant contribution to the revenue, primarily because of the lack of skilled manpower.	Skill and knowledge development programmes are needed for existing employees. Apart from acquiring new skills and knowledge such programmes affect employees' motivation.

Introduction

Background Information

Tool Room is the backbone of Industry as manufacturing excellence begins with tools, dies and moulds. To foster the growth of Micro, Small and Medium Scale industries in the country, Government of India set up ten Tool Rooms across the country with state of the art equipment for design and manufacture of tools and for training of manpower in employable skills. Of these, four were set up with the assistance of Government of Germany, three with the assistance of Government of Denmark, two under UNDP and one, at Guwahati, without any external assistance. These are set up as autonomous bodies, Government of India societies with DC MSME as the executing agency. The Tool Rooms have now been operating for about 10 years after close of the agreements of external assistance. GIZ is supporting an evaluation study of these ten institutions. M/s Grant Thornton Advisory Private Limited has been retained as Consultants to carry out the Study.

Terms of Reference

Tasks entrusted to the Consultants are to prepare As Is Assessment reports of ten Tool Rooms, their ranking recommendations on improving their performance and an action plan for the same. This report is Strategic Assessment report in respect of Tool Room at Guwahati.

The consultant team has been tasked to analyse the existing strengths and weaknesses of the ten Tool Rooms in terms of their management, finances, human resources, technology and infrastructure, as part of the Strategic assessment of that includes the following:

- a. Institutional/organisational development study of the scheme consisting of political economy aspects involving actors, financial flows, management systems and inter-agency issues
- b. stakeholder feedback on existing Tool Room services from MSMEs and relevant business associations
- c. stakeholder feedback on further requirements from Tool Rooms by MSMEs and relevant business associations [a, b to be executed in form of a user feedback survey]
- d. training needs of Tool Room personnel
- e. Comparison of services with similar private sector and German facilities.
- f. best practices from comparable national institutions such as the Nettur Technical Training Foundation (NTTF), Bangalore [NTTF is a private educational trust established with the help of the Government of Switzerland]

Methodology

Data has been collected through secondary research, publicly available information on MSME Tool Rooms and through a structured questionnaire, filled by the respective Tool Rooms. Facility of the Tool Room was visited and series of meetings and discussions took place with management local associations, suppliers, users and non users MSMEs, large client and state government agencies for qualitative assessment.¹

Based on the quantitative information and qualitative assessment, functioning of each Tool Room has been assessed and analysed to provide actionable recommendations. For improving alignment of Tool Room services to the strategic goals of government in setting them up through optimum mix of different service and delivery approach, increased revenue, outreach and impact; improved organisational procedures and governance mechanism, technological and human resource development need, enhanced networking etc. Recommendations shall be accompanied by a time bound and cost estimated action plan for the DC-MSME to implement. Cost estimates would refer to requirements of additional machinery and equipment, general infrastructure, staff restructuring training etc that would be needed to implement the recommendations. In addition, an institutional analysis framework that can be used by the Ministry in future will also be developed.

However, this report is limited to as is assessment and analysis of Tool Room functioning and recommendations are part of a separate report.

Structure of the report

Given below is a summary of how the report has been structured:

Chapter I – Organisation Profile: A brief description of TRTC Guwahati

Chapter II – Governance, Management systems and Processes: This chapter assesses the autonomy of the Tool Room and its Chief Executive, the Project Manager, guidelines followed by the Tool Room defined by the Ministry of MSME and the level of interaction between DC MSME and the Tool Room.

Chapter III – Organisational Assessment: This chapter assesses the current status of service portfolio, technological infrastructure, marketing strategy, finance, management systems, human resource and its impact against the stated policy goals.

Chapter IV – Overview of local Business Environment from Tool Room perspective: This chapter assesses the location of the Tool Room and the market potential for it to expand its services. It also analyses the availability of raw material and machinery suppliers in the region.

Chapter V – Inclusive Growth underlined by Social Impact: This chapter analyses the impact made by TRTC in all the three areas of training, tooling and dissemination of environmentally friendly technologies to MSMEs.

¹ Complete list of meetings and interview is placed at Annexure I.

Chapter I

Organisational Profile

Government of India established the Tool Room and Training Centre (TRTC) in Guwahati in 2002 with support from the Government of Assam, which provided land and buildings. An area of 6.7 acres was earmarked for the project in Amingaon Industrial area

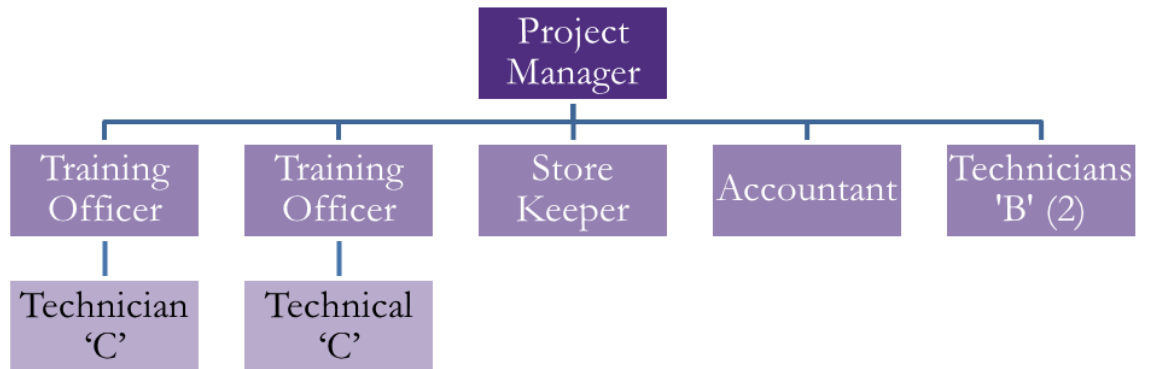
TRTC had been set up as "Government of India Society" under the Ministry of Micro, Small & Medium Enterprises, Government of India. Governing Council constituted by the Ministry manages the affairs of the society.

Table 1: Brief Profile

1.	Project Background	Tool Room and Training Centre (TRTC), Guwahati was established by the Government of India to cater to the tooling and training needs of industries of the NE region TRTC has been registered as Government of India Society under society registration act 1860 in February 2000. The Tool Room started functioning since August 2002 at MSME-DI campus. The activities at Amingaon premises started partially from January 2004..		
2.	Aiding Agency	Government of India and Government of Assam		
3.	Funding Pattern	GOI (In Rupees)	Government of Assam (In Rupees)	Total (In Rupees)
		18.10 crores	3.98 crores	22.08 crores
4.	Organisational Structure	Government of India Society – An autonomous body under MoMSME, DC MSME		
5.	Objectives	- To facilitate and encourage setting up of MSMEs in the Northern Eastern region in the cement, plastic, food processing and coal based industries and cosmetic sectors. - To develop production facilities of moulds, jigs, fixtures, gauges & other sophisticated tools preferable for Small scale industries - To train manpower in the field of tool making & other allied engineering trades both for the freshers and for personnel already engaged in the field - To provide common facilities in precision machining - To provide consultancy facilities primarily for Small scale units aimed at improvement in productivity.		
6.	Technology	Following technologies are available at TRTC for tooling, production and training. a. The tool production facilities include CNC milling and CNC		

		wire cut machine, Vertical Milling Machine, Universal Milling Machine, Surface Grinding Machine, Welding Machine etc b. Designing with AutoCAD, Master CAM, Catia, Solid works etc
7.	Training Programmes	a. Long Term Courses (One year or more duration)- 1. Two-Year Course in Machinist 2. One-Year Certificate Course in Advance Tool & Die Technology, Advance Machine Maintenance and Advance Machinist. 3. One –Year Certificate courses in Machine Tool Operation, Machine Maintenance and Welding. b. Short Term Courses (Less than one year) The Short-Term courses address various topics in the field of Tool Engineering. They deal with CAD designing, manufacturing technology, CNC technology and other skill based courses.

Organisational Structure



Chapter II

Governance, Management Systems and Processes

This chapter assesses the autonomy given to the Project Manager of the Tool Room, guidelines followed by the Tool Room defined by the Ministry of MSME and the level of interaction between DC MSME and the Tool Room. This also assesses the role of GC in the overall functioning of the Tool Room. This is to analyse how all these factors are contributing to or hindering the performance of TRTC Guwahati

Policy Goals and Direction

Outlined Policy goal for setting up of TRTC and all other Tool Rooms has been to enhance the competitiveness of manufacturing MSME through supply of tooling services and skilled manpower. However, monitoring of performance is mainly on financial parameters and not so much on outreach and impact. A clear reason that emerged from the interactions with the stakeholders is the policy direction which emphasises self-sustainability and cash recovery without much emphasis on the impact on MSMEs or job creation. As a result TRTC prioritizes training over job works which are largely from the MSMEs. No equipment is provided for tool making. Job work done by them is on training machines. The fees for training courses conducted are reimbursed by GOI and hence TRTC has been able to achieve financial sustainability. Thus, the centre contributes towards bridging skill gap faced by MSMEs but does not cater to the tooling demand of the growth of MSME in the region.

Autonomy of Institution

TRTC is set up as an autonomous society but is still to a large extent guided by the Government policies and in some cases even Government rules and regulations. The decision making body , Governing Council meets once in a year on an average and this mostly coincides with the Annual General Meetings called for approving the annual accounts and annual reports. The private sector members of the GC are not active participants.

Suggestion has emerged during meeting with DC MSME and with stake holders at TRTC that one central society under DC MSME to administer all Tool Rooms would improve governance issues and networking. This would be examined while consolidating management issues for all 10 Tool Rooms

Characteristics of Core Management Team

Lack of motivation was apparent within the core management team of Project Manager and the next line of representatives of the Departments. TRTC is headed by the Project Manager. There is no post of a General Manager or HOD's of Training and Production Departments at appropriate level as in other Tool-Rooms, Senior Manager or Manager. Thus the existing staff cannot be promoted to

the next level. Currently, training officers and technicians are managing the training and job working departments as a stop gap arrangement. If activities are to be expanded, the whole organisation needs to be reviewed and a working team positioned and production section organised. Higher vacancies are not being filled primarily on two accounts, one to keep the expenditure low as performance is judged mainly on financial parameters, that is income vis a vis expenditure and secondly, the availability of trained technical manpower. Some positions have been vacant since inception.

Annual Targets

There is no formal need assessment undertaken to estimate the market opportunity for its services. Each year annual targets are fixed by the governing council for revenue from training and job work/ production which are not linked to the market opportunity or desired level of impact. Targets are also fixed for number of persons to be trained and the number of industries and MSMEs to be assisted. Also there is no bifurcation in targets for revenue from training and production. The table below provides details of targets achieved by the TRTC in the year 2010-11

Table 2: Annual Targets

Service	Target	Achievement	Achievement %
Training (Physical)	1100	1103	100
Units assisted (MSME & others)	200	337	169
Training and Production (Revenue)	Rs 93 lakhs	Rs 124.82 lakhs	134

Source: Page 10, Performance report of MSME submitted to the Governing Council, by TRTC

Management System:

TRTC, Guwahati is not an ISO 9000–2000 certified organisation. There are Standard Operating Procedures (SoPs) that need to be implemented at the TRTC in order to receive the certification. Currently TRTC, Guwahati does not have the manpower or the range of services or operating procedures for getting certification. It is suggested that TRTC must, in the near future, set up operating procedures, receive certification and upgrade its level of services.

Procurement system

TRTC, Guwahati does not carry out any tooling and production activities; however it carries out job work to support the industry. For procurement of raw materials, for training and job work, the Tool Room follows the procurement guidelines laid down in the General Financial Rules (GFR) calling for quotations and decision making guided by L1 principle due to which suppliers tend to quote lower rates, sometimes compromising on quality. However, there are other difficulties in getting materials from outside the state on account of sales tax formalities of getting the forms and permits. As TRTC does only job work production for which materials are supplied by customers and training materials can be planned well in advance, the system works well with it.

For capital goods, an action plan with details of equipments and related costs is prepared in consultation with local GC members and submitted to DC-MSME at the beginning of FY which upon approval is ratified by the Governing Council. However, there may be delay in actual purchase since financial due diligence by the Integrated Financial Wing is after ratification.

Development of a procurement manual covering the operational details on above suggestions would be beneficial to improve efficiency and effectiveness of procurement. Also another suggestion came up during our interaction with the governing council was made to make the tendering process for procuring the machinery and equipment required in the Tool Room a common centralised process. This would not only enable them to get better deals for the machinery and equipment requirement

of the TRTC's, but optimize the time and resource required to pursue the vendors. This could also cover the raw material requirement of all Tool-Rooms. This will be dealt with in combined report to be submitted separately.

Networking with other Tool Rooms, institutions and alumni

TRTC can significantly improve networking with alumni which can lead to more business and placements as many ex-trainees eventually occupy decision making positions for tool planning and training in the Industry. There is no formal system to engage alumni at present.

The training initiative can be scaled up through networking with institutions having infrastructure available with them e.g. ITIs, Polytechnics, state government institutions, etc. There are such technical institutions in Guwahati itself. Networking with other Tool Rooms under MoMSME would also be useful for knowledge and capacity sharing. Again IT enabled platform for such networking is essential. At present networking with other Tool Rooms is through meetings of General Managers of Tool Rooms which take place once in a year.

Interaction with DC MSME

DC MSME monitors the performance of Tool-Room. System is in place under which Tool Room submits the following reports:

a) Performance report, submitted monthly. Against annual targets, following information is submitted for the month and cumulative during the year up to the month of report:

Revenue, expenditure, number of trainees and number of MSMEs assisted. Tool Room is required to explain the short falls, if any

System brings out cost recoveries but not the impact and out reach to MSMEs. Instead of monitoring numbers it should bring out the value of assistance provided to MSMEs and highlights of 5 technology related assistance cases. System should also be evolved to monitor customer and trainee feedback of courses conducted.

b) Annual action plan containing targets and funds needed during the year for recurring and non-recurring expenditure. It is prepared in consultation with local members and submitted to DC MSME who approves the same in consultation with Integrated Finance Wing of the Ministry. It is then put to Governing Council for ratification. Role of Governing Council is limited to local members who are consulted. Ratification is a formality.

c) Monthly status of courts cases in which DC MSME is respondent.

d) Annual Report which includes audited annual accounts for placement before the Parliament.

e) Information on innovative work done. This is used for preparation of Cabinet Note on performance of MoMSME.

f) Annual manpower status

Decision Making

Management of the Tool Room is with the Governing Council. However it meets once in a year, on an average, when convened to pass Annual Accounts and Annual Report. These meetings are generally held away from the Tool Room premises. Also representatives of industry are not found to be taking interest in decision making and it is generally the officials from MoMSME and state Govt. who deliberate in the meetings. Members other than officials are volunteers. It is needed that the

structure is revised in favour of greater percentage of independent members with no personal or professional relation with Tool Room e.g. representatives from universities and technology leaders. They should be paid honorarium for their services.

While expectations from TRTC are similar to those from a private commercial Tool Room, it is not allowed a similar level of independence.

Chapter III

Organisational Assessment

This chapter assess the current status of service portfolio, technological infrastructure, marketing strategy, finance, management systems, human resource and its impact against the stated policy goals. This chapter also analyses different factors which are either contributing and or hindering to the performance of TRTC Guwahati in achieving its stated objective and policy goals of “enhancing competitiveness of manufacturing MSMEs through tooling services and availability of skilled manpower”.

Overview of Services

TRTC Guwahati is currently offering “Training services and Job Works” which are in line with its overall stated objectives. The following services are currently being offered by TRTC:

Table 3: Service Mix of TRTC Guwahati

Production		
Tooling	Job work	Training ²
Tools are not manufactured in the TRTC	- Manufacturing of accurate Jobs and Machine Components - Repair of Dies and Tools - Re sharpening of cutting tools	- Long term training in SCVT mechanist, Advance Mechanist, Machine Maintenance and Tool and Die making. - Specialized hi-tech courses in tool and die technology and CAD/CAM for Engineering Graduates, Diploma and ITI Certificate holders. - Skill based courses for School drop outs in Plumbing, Industrial wiring, Motor cycle service and Repairing (sponsored by IGNOU)
In addition to the above TRTC also provides Consultancy and mentoring support to MSMEs to improve productivity by use of better tools and / or better production processes		

² List of short term and specialised courses conducted by TRTC is in Annexure IV

The service – sector matrix below indicates the services utilisation by respective sectors:

Table 4: Service - Sector Mix of TRTC Guwahati

Type of Tools/ services	Industry Sectors					
	Bicycle	Plastic/ Rubber	Auto Component s	Pharmace uticals	Home Appliance s	Others
Job work	—	√	—	√	—	√
Training	√*	√	√		√	√

*Only repairs and maintenance

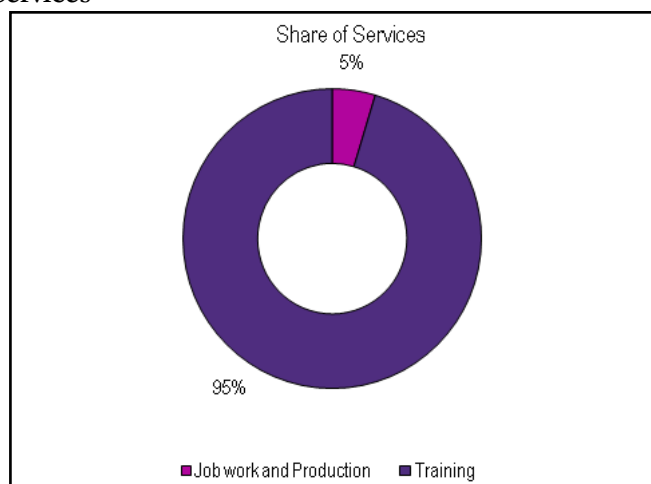
Contribution

The breakup of revenue contribution from various services is given in the table below:

Table 5: Break-up of Revenue Contribution

Services	Income (Rupees Lakhs) in 2010-11
Job Work and Production	6.81
Training	92.47
Other Income	25.54
Total	124.82

Figure 1: Share of Services

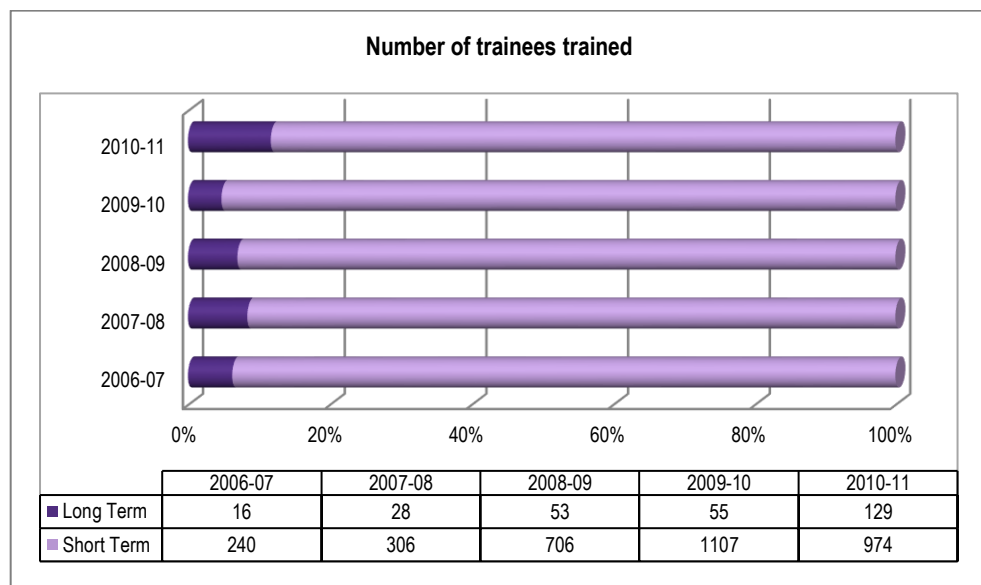


TRTC Guwahati does not have the capacity to carry out tooling and tool design activities. Maximum revenue is generated by training services in the service mix of the TRTC, contributing more than 95% of total sales realization in 2009-10. Only 5% of the revenue accrued is from job work. The contribution of income from training to total income has been steadily increasing every year, with a YOY growth of 15% in FY 2006-07 to 34% in FY 2009-10. The training income contributed 79% of the total revenue, which increased to 95% in 2009-10. The contribution of income from sale of tools has been increasing over years, from YOY growth of 31% in FY 2005-06 to 39% in FY 2009-10. This trend must be arrested if TRTC has to serve the industry in the field of tooling. Creation of tool making facility and fixing of targets in this regard and aggressive marketing is needed. The targets from this must indicate the share of MSMEs.

Training

Maximum revenue of training services is from short term courses. However, considering sustainability, about 45% of training revenue is fee from the candidates and balance is contributed by the Government (fee for SC/ST). There is huge demand for the long duration programmes as TRTC is often the first option of Joint Entrance Test applicants. The industry feedback is very positive too as TRTC graduates are considered to have better practical skills as compared to ITIs or even engineering colleges. Trend from 2006-07 to 2010-2011 is given in the diagram below.

Figure 2: Number of Trainees trained



TRTC Guwahati has a good reputation in Training. In 2010 – 2011, TRTC trained over 1100 trainees. Trainees in short term courses have increased in higher proportion than in long term courses. The trainees for short duration programmes are primarily personnel already working in the Industry and students from the engineering colleges, ITIs or polytechnics who undergo these training courses to improve their practical skills.

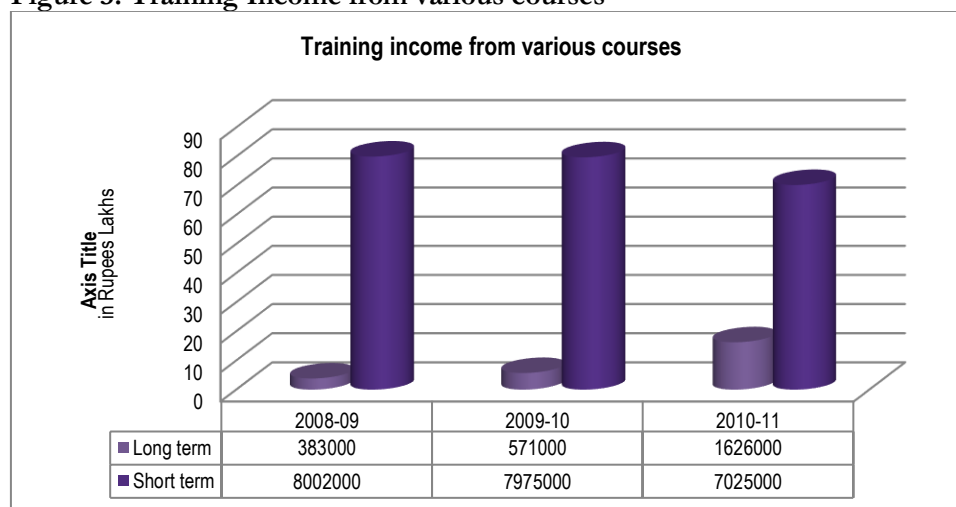
In 2010-11, about 94% of total trainees were unskilled persons who were imparted employment oriented skills while the balance 6% upgraded their existing skills.

The students for both the short term courses and the long term course (including condensed courses) can be admitted from all over the country but owing to the difficult conditions, are primarily from the region (100%). The students for both in long and short term courses about 87 % trainees come from the region and 13 % from the rest of India. Initially the demand for these courses from outside the state was also substantial at 49% but this has decreased over the years. The courses in demand are mechanical courses. TRTC centre selects candidates through an examination for certain courses

Training Income

Given below is a breakup of the training income received from long term course, short term course and condensed courses. The training department receives major proportion of its training income from the various short term courses conducted by the Tool Room. Currently 50% of the training income is coming from various skill development support programme of state /central government

Figure 3: Training Income from various courses



Scholarships and Fee Waiver

There are no scholarships provided to students by the TRTC, however the training fees for SC/ST students are reimbursed by Government of India. If 25 students join at one time, TRTC gives 10% discount. TRTC Guwahati has not had any industry sponsored candidates. The Ministry of DONER (Department of North Eastern Region) has been sponsoring 143 candidates since 2010 onwards.

The sustainability of training is of significant importance, however almost 90% of the training income is from Government subsidy.

Placements

TRTC has a 100% placement record for its long term training programmes. Placements are not arranged by TRTC for short duration programmes as these are mostly skill up gradation programmes. The industry recruits the students by conducting on and off campus interviews. Placement tracking information is not maintained by the TRTC, such information will be useful in analysing the segment of industries absorbing these student and assessing the actual benefit to MSME's.

Post Placement Tracking

There is no system of post placement tracking of candidates and thus leveraging the alumni potential for marketing of Tool Room services.

Pricing of Services

Job Work

TRTC does not carry out any tooling and production; however charges for job work is calculated on the following formula:

$$\text{Cost} = \text{Machine hour rates} \times \text{Number of hours on the machine}$$

The Machine hour rates take into account the following components:

- Machine price
- Depreciation
- Electricity
- Consumables
- Maintenance
- Labour
- Overheads (Salary of Management staff, Maintenance, Administrative staff)
- Contingency
- Margin

The machine hour rates were updated last in 2007 and the Project Manager was authorised to increase the same by 5% per year depending upon the market conditions. The prices are higher than the prices charged by the private Tool Rooms. The market perception is that TRTC prices are overly charged as compared to the services offered. The production at TRTC is a time consuming and a lengthy process. The Tool Room attributes these delays in servicing the customers to unreliable power supply. The recently installed generator set is expected to overcome these operational delays.

Training

The cost for each training programme is estimated at the time of commencement of the particular programme but comparison with actual costs is not available. Similarly, cost viz-a-viz fee comparison for each course is not maintained which makes it difficult to ascertain sustainability of training division as a separate business unit. This fortifies recommendation for a FMIS.

Marketing -

System

TRTC conducts marketing for the production facilities as well as for the training courses. The visits are conducted by engineers and technicians, on an average of twice a week. The marketing visits are to various industries, especially chemical and plastic industries. Since there is a shortage of manpower, there is no dedicated team deployed to carry out marketing activities.

Strategy

For marketing and promotion, TRTC participates in annual exhibitions like International Trade Fair and Vendor development Programme at Guwahati. The team makes periodical industrial visits to their regular customers. It would be useful for the marketing team to have a strategy which is based on market need assessment and segmentation.

The marketing of training services is through traditional means of newspaper advertisements and network with engineering colleges, ITI, Poly-techniques and diploma colleges, industry associations, etc. Personal visits are made throughout Assam in Guwahati, Itanagar, Silchaur and Jorhat. The

most significant source of candidates for the short duration programmes are the students of engineering colleges, ITIs, Polytechnics that enrol for summer trainings and project work. TRTC through its marketing efforts has established the tie-up with IGNOU to sponsor candidates.

There is significant room for improving the development and marketing of short duration fee based programmes for employable skills. A plan is required to reach out to the employer industry as well as pool of potential trainees for this purpose.

Constraints:

Key challenge faced by TRTC in marketing of its production services is higher cost for simple job works and time consumed to deliver the product compared to small private workshops and absence of strategy based on proper market need assessment and segmentation

Client Profile

Given the profile of industry in Guwahati and adjoining states, the maximum demand of tooling is for moulds, forging dies, press tools, die casting dies etc. TRTC is currently not carrying out any tooling. The reason for this is lack of expertise and manpower to operate it. They have the equipment but not the trained designers or precision operators. At the national level, plastic moulds have a share of about 37% of total tooling demand and expected to growth at CAGR of 17%³ followed by sheet metal, die casting and forging tools. The break up for spread of products, for the last five years is given in the table below:

Table 6: Spread of products, percentages based on values

	Percentage Share from 2006-07 to 2010-11
Moulds for Plastics	90%
Jig Fixtures & Gauges	5%
Forging Dies	-
STD Items / Components	5%
Inspection related CMM Jobs Design & Consultancy	-
Other Production Aid (Heat Treatment)	-
Rapid Prototyping	-
Total	100%

Types of Industries Served – MSMEs assisted

The share of MSME customers of TRTC has been 100% over the years. However, the interactions with the customers of TRTC suggested that most of these MSMEs are medium scale units with many having their captive Tool Rooms and come to TRTC when short of capacity. Most of these customers plan to increase their investments in captive Tool Rooms and their requirement from TRTC may not grow. However there is a growing demand from upcoming MSMEs for TRTC services. They cited long and non reliable delivery schedule, lack of design capability and demand from their buyers to build in house capabilities as major constraints of TRTC's services. At the same time, the micro and small scale users suggested that they cannot invest in Tool Room facilities and depend on locally available commercial Tool Rooms because the TRTC prices are significantly higher. However, they rate quality of job work products supplied by TRTC to be better than those of local commercial Tool Rooms/workshops. The table below provides trend of share of MSME customers to total customers of the TRTC

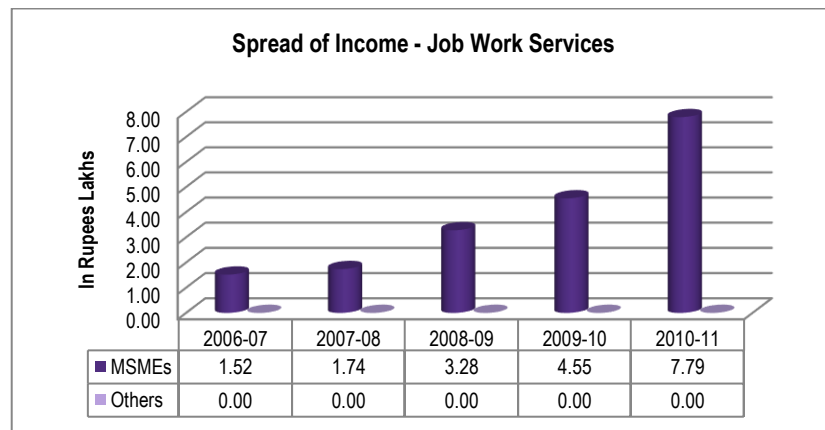
³ TAGMA Indian Tool Rooms Industry Report 2011

Table 7: Industry Break up of TRTC Guwahati

Type of Industry	2006-07	2007-08	2008-09	2009-10	2010-11
MSMEs	-	100%	100%	100%	100%
Large Scale	-	-	-	-	-

The share of MSMEs and large enterprises in TRTC's revenues is indicated in the bar chart below:

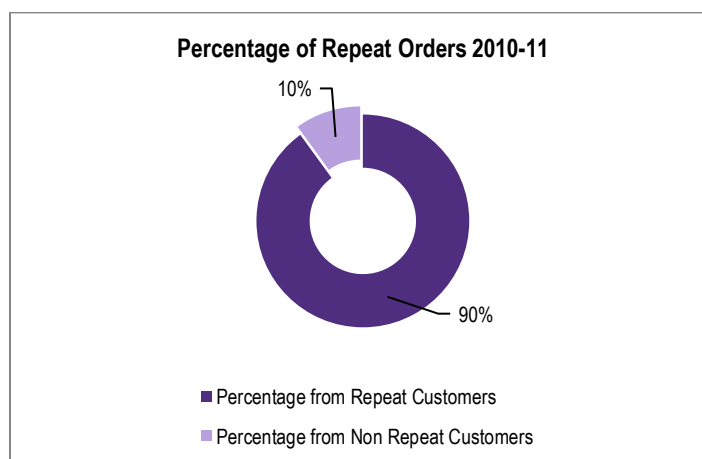
Figure 4: Spread of Income – Job Work Services



Proportion of Repeat Orders:

TRTC scores well on customer satisfaction and retention, most of the TRTC's job work orders come from repeat customers, which is 90% in 2010-11.

Figure 5: Repeat Orders 2010 - 11

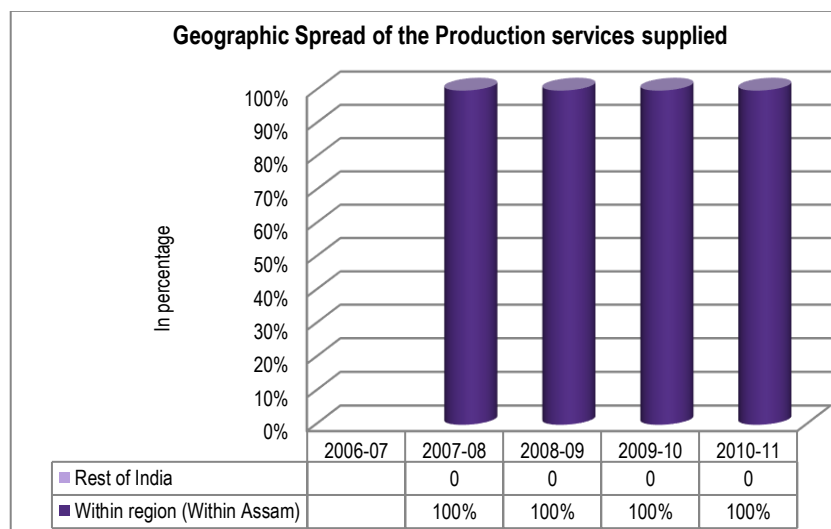


Geographic Spread of the clients for job work services

As indicated in the chart below, while majority of the customers of the TRTC are from the region, their share has been 100% from 2006-07 to 2010-11. The tool user industry in the North East (Chemicals, plastics, etc) is quite significant and servicing local customers is usually more efficient.

and lucrative. However there is significant potential for impact as there are thousands of upcoming MSMEs in the region.

Figure 6: Geographic Spread of the Production services supplied



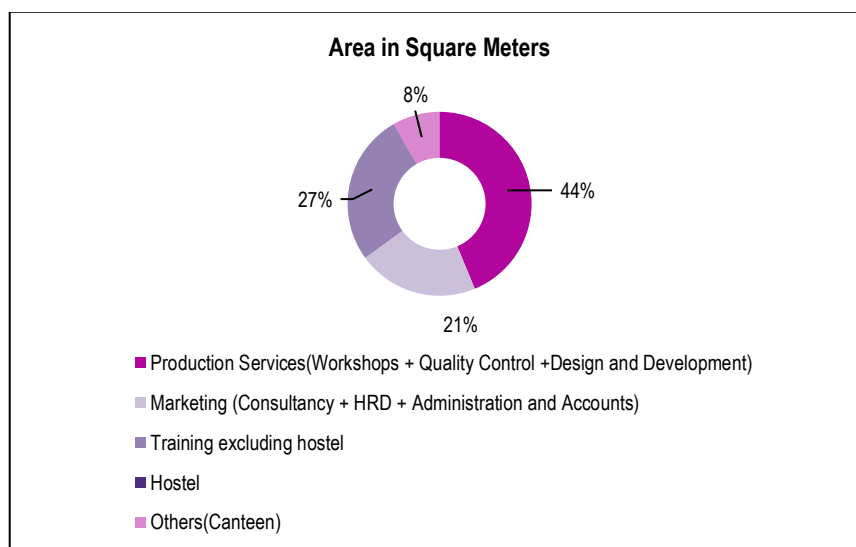
Physical and Technical Infrastructure:

Physical Infrastructure

TRTC is moderately equipped public commercial Tool Room in the Northern Eastern Region, with its main focus on training activities. It is located in the industrial area in Guwahati on a developed plot of land of 6 acres. The total built up area of TRTC is 2409 square meters. The built up areas for the various departments is given below:

Table 8: Facility Break up of TRTC Guwahati

Facility	Area in Square Meters
Production Services(Workshops+ quality control)	1050.00
Canteen	200.00
Training	640.00
Marketing(Admin and Accounts)	510.00
Total	2409.00



There is sufficient land available with TRTC for its future expansion. The TRTC has already begun construction for the hostels, administrative buildings classrooms, quarters for staff etc.

Utilities:

As regards utilities, TRTC has an electrical sub-station, submersible pump and tank for water supply. TRTC has power back up which can feed all the critical equipment in case of power cut by State Electricity Board. They have the following DG sets:

Table 9: Power Back up

Capacity	Flexibility for use
Connected Load	635 KVA
Transformer	800 KVA
125 KVA DG Set	The system is flexible. It can feed all important machines on priority basis, as selected by the Management.

TRTC depends on outside supplies for welding gases, oils and other utilities. It has its own arrangements for water supply.

Equipment in Production Related Services Sections:

TRTC does not have any production section and no separate equipment for it. It does not carry out any tool production activity. Job work is carried out on the equipment provided for Training.

Appropriateness of Technology

Discussion with representatives of Tool and Gauge Manufacturers and representatives of Industry using the facilities at TRTC indicate that, with the fast growth of manufacturing industry, particularly the pharmaceuticals, chemical, plastics and packaging industry with special incentives given in the State, demand for more accurate tooling that involves more complex shapes and faster deliveries (due to frequent change of models and designs) is growing. TRTC should therefore gear up and have equipment capable of heat treatment and equipment for design and manufacture of plastic moulds for packaging machines and blister machines.

Equipment in the Training Department:

Training Department is fairly well equipped.⁴ Equipment includes conventional machines as well as CNC machines of a general engineering workshop. The department also has typical tool room equipment like:

- CNC Wire EDM Machines
- CNC Electric Code EDM Machine
- CNC Milling Machine
- CNC Lathe
- CNC Co-ordinate Measuring Machine
- CAD/CAM hardware and software

Human Resources:

Out of the ten Tool Rooms under the Ministry of MSME, TRTC Guwahati has the least number of employees, with strength of 9. In addition to the Project Manager who is the Chief Executive, TRTC has the following personnel:

Table 10: Personnel

Designation/ Department	Senior Manager	Manager	Assistant Manager	Foreman/ Engineer	Technician	Others
Administration	-	-	-	-	1	1
Marketing	-	-	-	-	-	-
Design	-	-	-	-	-	-
Production	-	-	-	-	-	-
Training	-	-	-	-	6	-
Rapid Prototyping	-	-	-	-	-	-
Quality Control	-	-	-	-	-	-
Maintenance	-	-	-	-	-	-
Sub-Total	-	-	-	-	-	-
Total	8 (9 including Project Manager)					

Vacancies and requirement: Out of the 10 tool rooms, TRTC Guwahati has the minimum manpower. There is a requirement of 26 personnel of which only 15 positions have been sanctioned. Of the 15 sanctioned posts 7 remain vacant. Due to politico-economic situation in the state, lack of opportunities, level of education, TRTC has not been able to fill up even the sanctioned posts and take up design and manufacturing of tools. Their position can be summed up as below:

- As many as 15 personnel have been sanctioned by the GC but there is an acute shortage of trained manpower in the area. Hence 6 positions are vacant for more than 2-3 years; some positions are vacant since inception.
- Production Department which should be the nerve centre of TRTC has no Head of The Department at an appropriate level of Sr. Manager. It is being looked after by an Assistant Manager.
- Training, which is currently the key strength of TRTC Guwahati, is training as many as 1103 students with 7 staff members. The student teacher ratio is 158:1, which is very low as compared to the training norm of 25:1.

Skill up gradation /capacity building need

⁴ List of equipment in Training Department is given in Annexure III

Skill and knowledge development programmes are needed for existing employees. Apart from acquiring new skills and knowledge such programmes affect employees' motivation. There has been no training of officials at any levels.

Retention: All employees of TRTC are contractual. In order to retain trained and experienced manpower and encourage fresh recruitments, it is essential that the employees of the TRTC are brought on rolls of the organisation. All employees including the Project Manager are at the Tool-Room for more than 5 years. Retention therefore does not seem to be a problem if people can be attracted through effective recruitment drives.

Out of the 9 employees, 6 are shop floor operators and supervisors. More significant is the fact that acquisition of new skills is rather limited e.g. the production /training team is not updated to use latest design and simulation software, something that is bare essential for a tool room now- a-days which will be needed when TRTC takes up design and manufacture of tools. The senior management has also not undergone any management development programme recently. The training department team can significantly benefit from acquisition of latest pedagogical skills as also management skills for large scale training programmes

Incentive System: The Tool Room currently has no incentive system in place for the employees as they have not accepted an incentive system based on the guidelines issued by DC MSME for all Tool Rooms. Only bonus as announced by the Central Government for Government employees is paid but it has no link with the individual performance.

Developing MIS to establish accountability and contribution of each individual employee and departments will improve effectiveness. It would also enable putting in place a performance linked incentive system.

Operational Efficiency

Lead Time and Quality

Currently, TRTC Guwahati does not carry out any tool and production activity. All stake holders like associations of industry, user industries and members of the Governing representing industry and well as Director MSME Development Institute highlighted that while the quality of job work from TRTC is good, prices are very high and the delivery times a bit too long. Higher prices discourage MSMEs, specially micro and small units to use TRTC, an issue which needs to be redressed. Better quality will attract more prices. Deliveries could be improved by having a production shop as training machines may not always be available for job production.

Machine Utilisation

Being a training institute only, no organised data is collected about machine utilisation. However from the equipment they have and the training, it could be seen that utilisation of equipment is fairly good.

Breakdown

TRTC Guwahati does not collate such information on machine breakdown periods. Such data can be used to identify machines that are obsolete, need replacement and machines that need maintenance. This again fortifies the recommendation for an FMIS.

Financial Analysis

Analysis has been done of the performance data for the last five financial years from the TRTC's Annual Reports made available for the following indicators:

1. Net worth
2. Profitability analysis
3. Trend of income and expenditure

Net worth

The net worth of an enterprise is the sum of total equity and retained earnings. Net worth reflects the value of the enterprise, considering it is composed primarily of the money that has been invested in the enterprise since its inception, as well as the retained earnings for the duration of its operation.

Table 11: Net worth Table

Particulars	2005 - 06	2006 - 07	2007 - 08	2008 - 09	2009 -10
Net worth	57,308,118	67,461,650	87,007,791	109,623,986	130,313,357
Year on year increase		18%	29%	26%	19%

Net worth of TRTC Guwahati has been increasing every year around 23% on an average, which is a healthy sign as it implies an increase in equity or value of the Tool Room. During the years, the Tool Room was also in receipt of government grants. Following reflects the trend of government grants being received by TRTC Guwahati:

Table 12: Grants received by TRTC, Guwahati

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10
Contribution from GOI	13,780,285	12,734,590	22,663,447	25,000,000	29,500,000

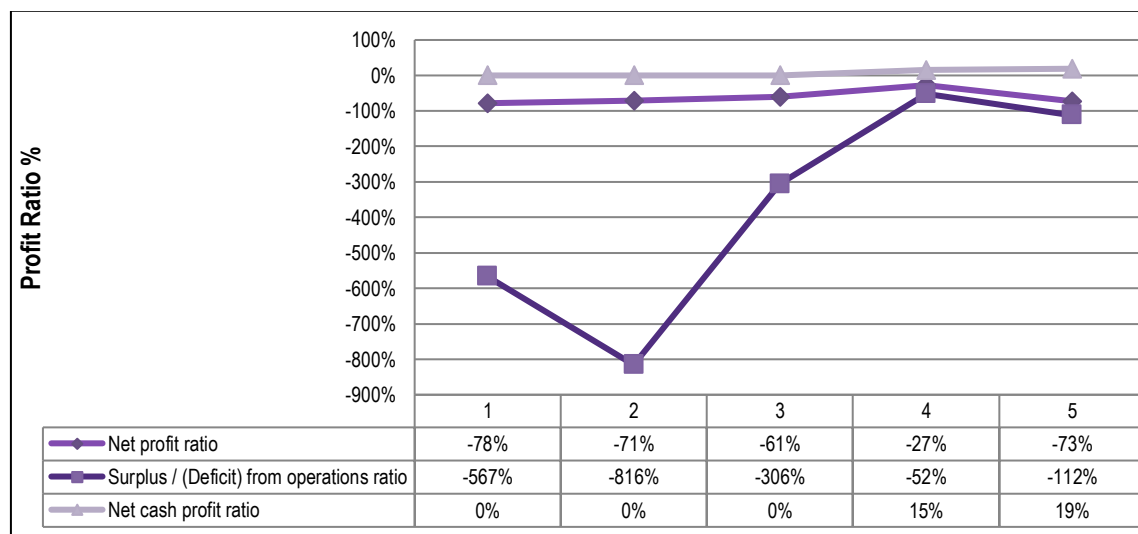
Net worth of the Tool Room excluding the government grants received is provided in the table below:

Table 13: Net worth excluding grants

Particulars	2005 - 06	2006 - 07	2007 - 08	2008 - 09	2009 -10
Net worth excluding government grants	43,527,833	40,946,775	37,829,469	35,445,664	26,635,035
Year on year increase		-6%	-8%	-6%	-25%

The net worth of the Tool Room is being sustained only on account of government grants. If the same are withdrawn, the net worth of the Tool Room is declining on account of losses being accrued. All investments by the GoI are getting eroded as a result of losses made by the TRTC.

Figure 7: Profitability and Composition



Tool Room Guwahati has been operating with a deficit in the five years from FY 2005-06 to FY 2009-10. However, there has been no cash deficit. The Tool Room was at cash breakeven point in FY 2005-08 and a cash surplus situation in FY 2008-10.

The deficit is on account of depreciation and the same accounts for the largest share of expenses incurred by the Tool Room, averaging 42% in the five years FY 2005-10. Salary costs accounted for around 39% of the total expenses in FY 2005-06, but have reduced since then, and in FY 2009-10, the same accounted for only 23% of the total expenses.

The increase in cash profitability is on account of an increase in the revenue which has even set off depreciation to some extent. However, overall profitability dipped in FY 2009-10 again on account of a significant increase in depreciation expenses which increased 197% in FY 2009-10 as compared to FY 2008-09.

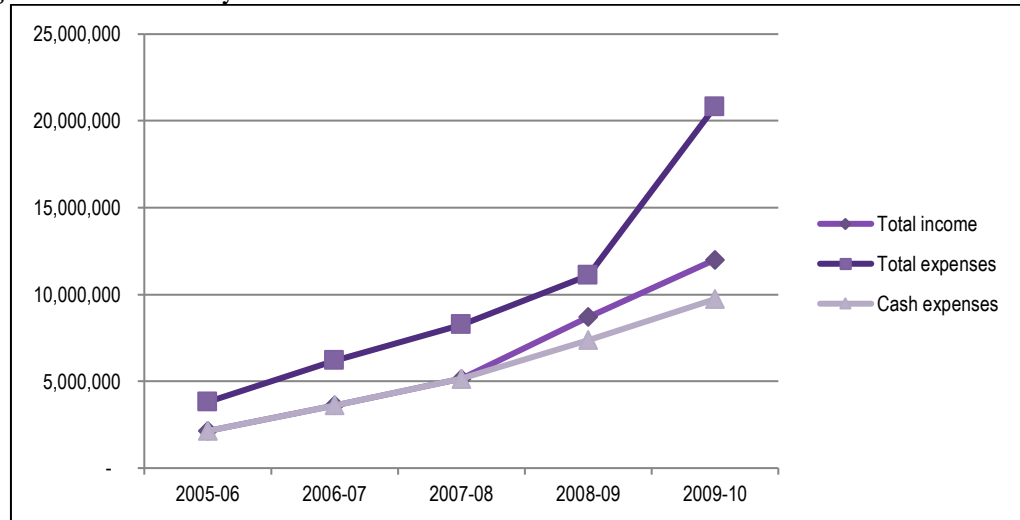
The contribution of income from training fees and subscriptions has grown significantly over the years from 27% in FY 2005-06 to 82% in FY 2009-10. Unlike other tool rooms, there is no revenue from sale of goods and services.

Initially the government grants accounted for as the prime source of revenue in FY 2005-06 at 57% which increased further to 63% in FY 2006-07, but since then the contribution of government grants to the total income has been reducing, with the grants constituting only 7% of the total income in FY 2009-10.

Trend of income and expenditure

Given below is a diagram reflecting the relationship between the income, expenses and cash expenses:

Figure 8: Trend Analysis



- Tool Room has been incurring a deficit as the expenses are in excess of income. However, the biggest expense for the Tool Room is depreciation and as the same is a non cash item, the Tool Room has not incurred a cash deficit. Moreover, the Tool Room was earlier primarily dependant on recurring government grants, but the same have reduced and the income from trainings has grown at a significant rate of 128% (average rate of increase in the five years FY 2005-10).
- Against this, total expenses have grown at a pace of 54%, and if depreciation is excluded, then the cash expenses have grown at a rate of 47% in the five years FY 2005-10.

Thus the Tool Room has remained cash positive. But in FY 2009-10, depreciation recorded a year on year increase of 197% due to which the gap between total income and total expenses has further widened, as can be seen in the graph above.

Chapter IV

Overview of Local Business Environment from Tool Room Perspective

This chapter assesses the location of the Tool Room and the market potential for it to expand its services. It also analyses the availability of raw materials and machinery suppliers in the region, although Tool Room has no control over these factors but they do affect its working.

Location and Market Potential

TRTC is located in the industrial area at Amingaon Industrial Area, near the Export Promotion Industrial Park (EPIP) in North Guwahati in Assam. It is well connected by air, rail and road. TRTC is strategically located in the largest metropolis of north-eastern region of India and was set up to cater to the tooling requirements of Mizoram, Tripura, Manipur, Arunachal Pradesh, Meghalaya and Nagaland. Assam is clearly the gateway to the North East, neighbouring Myanmar, China, Bangladesh, Nepal & Bhutan making it positively viable for trade with ASEAN countries. The Industrial Policy of Assam 2008, lays emphasis on sectors such as food processing, cement industry, plastics and packaging, hydro power, mineral based industries, pharmaceuticals etc. The chemical industry, fasteners, plastics, home appliances, electrical and auto component industries in these cities are estimated to consume more than Rs 500 crores of moulds, blanking dies, forging dies, sheet metal dies, etc according to the TAGMA Report 2010-11.

The Supplier Chain

Raw Material Suppliers

As tooling work does not take place in TRTC, the requirement for tool steel does not arise. The requirement of raw material for training and job work is procured through tendering process or purchased directly from the vendor in case of low value products. Mild steels are available locally, for alloy steels and other materials are purchased from Kolkata. Since training materials can be planned well in advance it does not prove to be a big disadvantage.

The logistics involved in sourcing raw materials makes the entire process of Tool making in Assam a long drawn and unviable process. At present, industries mainly depend on obtaining raw materials for training from Kolkata. This factor should be kept in view in planning a tool production unit. TRTC has to have more stock of commonly used tool steel than other Tool Rooms.

Machinery Suppliers

There are two kinds of machines at the TRTC, conventional and precision. The conventional machines are from HMT, Battliboi and other domestic manufacturers. TRTC has the know how to service such machine tools in house. The other kinds of machine tools are CNC machine tools and other precision machines which are to some extent produced in the country. However, high end machine tools of this category are imported mainly from Switzerland and Germany and lately also from China where less accuracy and versatility are acceptable.

These machinery suppliers primarily have agents / representatives based in Kolkata, but service engineers at their headquarters, mostly in Mumbai and Bangalore which often causes delay in attending major faults and breakdowns.

Summary of Backward Linkages

Table 14: Backward Linkages³

Input	Linkage/ Sources
Raw Materials	Stockists are Kolkata based, Mumbai and Chennai. Agents and importers in Mumbai and Chennai
Machine Tools	Manufacturers of indigenous machines. Direct imports for imported machines, nearly all such suppliers have agents in India for liaison and service back up. Some imported machines are also available in rupee payment in India from agents
Standard Moulds and Die sets	These are not needed in TRTC at Guwahati at present
Cutting Tools	Some are purchased from the local market, most manufacturers and stockists are all based out of Kolkata
Consumables like oils, greases, salts	Stockists in Guwahati as well as in Kolkata
Spares	These are not available in Guwahati, these are sourced either from Kolkata or Mumbai
Specialised Maintenance/ Servicing of CNC Machines	By the machinery suppliers. TRTC has not signed Annual Maintenance Contracts with suppliers so far. AMC tends to be expensive hence maintenance on visit basis is preferred by TRTC. Service agents are based at the headquarters of the agent and arranged on need basis. Agents of a few foreign principals/suppliers have their branch offices or liaison offices in Kolkata which causes delay in liaison with service engineers who in turn are based in their headquarters in Mumbai, Bangalore etc. The Kolkata Tool Room often assists them in identifying maintenance personnel.

Growth and Presence of Private commercial Tool Rooms:

As per various industry estimates, currently there are about 3-4 private tool rooms and a number of captive tool rooms. Majority tooling requirements of the industry are met from tool-rooms in Kolkata as most of the commercial Tool Rooms are small engineering workshops and specialise in specific area. They can upgrade their operations if TRTC can assist them with common facilities for precision and complex machining operations

Government Tool Rooms cannot meet the gap between demand and supply of tools. Private commercial tool making must be encouraged and Government Tool Rooms should act as a catalyst.

Chapter V

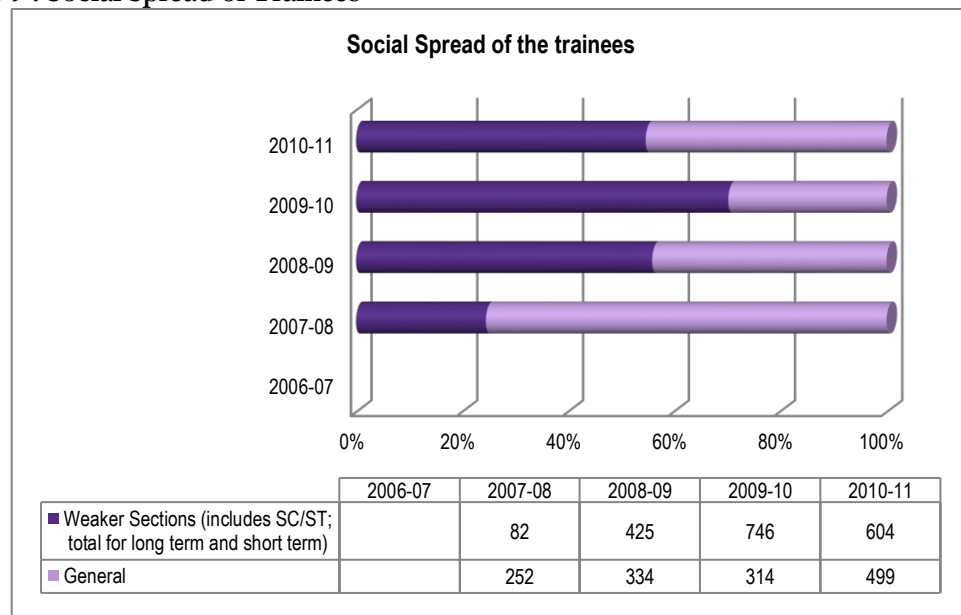
Inclusive Growth underlined by Social Impact

TRTC has made impact in all the three areas of training, job work and dissemination of environmentally friendly technologies to MSMEs. TRTC trains about 1000 candidates per annum under various training programmes resulting in employment creation across the sections of the society. TRTC's assistance has resulted in growth of the MSME in the region and has tremendous potential to graduate to a scale enterprise. With tooling and production machinery aligned to the market demands, TRTC can go a long way in shaping the future of MSME in the region.

Social Spread of Trainees

TRTC has had a balanced spread in terms of training to General category students and weaker sections.

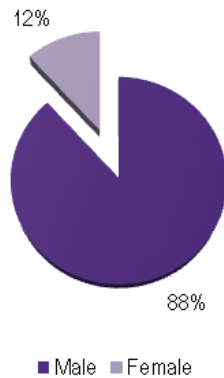
Figure 9 : Social Spread of Trainees



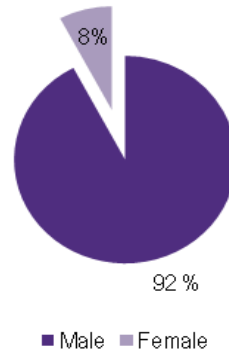
Gender Spread

Given below is the gender spread in the Tool Room for its long and short term courses for the last three years. The sex ratio of trainees is very weak and no special incentive is provided to encourage women to participate in the trainings.

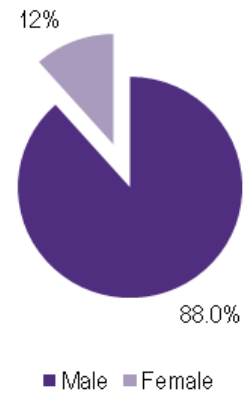
Gender Spread 2008-09



Gender Spread 2009-10



Gender Spread 2010-11



The impact of TRTC in terms of development of MSMEs is rather limited and scaling up has not been undertaken. The number of trainees is marginal in comparison to industry demand. The Industrial Policy of Assam 2008 highlights that the Chemical and Plastics industry has a huge requirement of trained manpower to run their operations. The ratio of direct employment to indirect employment in such industries is 1:1000 as every direct job generates 1000 jobs in the downstream industries. It is estimated that a lakh rupees of investment in fixed assets in the small scale sector generates employment for four persons. Thus with the forecasted growth of industries in Assam and the North eastern belt the requirement for skilled manpower will be tremendous.

SWOT

Strengths

- TRTC at Guwahati was set up with development objectives and offers its services without commercial objectives. It does not have any designing or tooling activities but offers job work services and mainly focuses on training
- TRTC is reputed for quality of its products in the field of Training Services
- TRTC has a fairly good training expertise and equipment.

Weakness

- No tool design facility
- No tool production section.
- High delivery times for job work
- TRTC has extremely low number of personnel thus making it difficult in maintaining and sustaining operations
- Pricing is not scientific and management's capacity is limited in using pricing techniques and other financial management tools
- Employees are contractual and thus have very low affinity to stay on
- Lack of performance based incentive scheme to motivate employees
- Limited use of Financial and Management Information systems

Opportunities

- TRTC has established reputation of a quality tool maker.
- Significant scope for scaling up training and tooling services given the favourable market conditions and state support to industries
- Abundant demand for tooling from the region. The national tooling demand is estimated at about Rs.13, 225 crores, TAGMA Report 2010-11
- Located in a growing industrial area
- Huge requirement of trained manpower
- Government support for capital investment is available

Threats

- Over the years emphasis has shifted from Tool Design & Manufacture to Training.
- Monitoring based on indicators of self sustainability has diluted impact on MSMEs and job creation
- Easy procedures and low customs duties for import of tools. TAGMA's latest survey indicates that more than 31 % tooling is imported in the country
- Low price levels and faster deliveries of tools from some countries, especially China.
- MSMEs prefer low cost of tools.

Conclusion

TRTC has made significant impact in the past in creating skilled manpower and job work for the MSME's. However, sustaining and scaling up the impact is critical. It would be a major challenge given constraints like absence of equipment for tool design and manufacture, lack of human resources for the same and low level linkages with local MSME market, limited networking skills, low level of use of modern financial and management systems, limited managerial skills, and severe shortage of man power etc.

The policy direction and monitoring indicators mainly gives weightage to self sustainability which needs to be revisited as the impact on MSMEs and job creation is of equal significance. Over emphasis on cost recovery and related financial indicators has resulted in reduced impact on the MSMEs in tooling services. It is also necessary that TRTC develops an understanding of the current and emerging MSME needs (especially local clusters) on both training and tooling fronts. A formal survey of the MSME market relevant to the TRTC is needed for this purpose. This would be essential to establish short and long term targets with an eye on the impact.

Annexure I

Details of Visit

Details of visit of GT Team to TRTC Guwahati

Date of the Meeting	Name of the City	Organisation/Agency	List of People Met	Designation
27 June 2011	Guwahati	Meeting at TRTC Guwahati	Mr. Kajal Kumar Saha	Project Manager & CEO
27 June 2011	Guwahati	User Industry	Mr. Prakash Sahu	Abdos Lamitubes
27 June 2011	Guwahati	User Industry	Mr. Manju Nath	Ozone Pharmaceuticals and Ozone Ayurveda
27 June 2011	Guwahati	User Industry	Mr. Ravi Sharma	Purvanchal Enterprise Private Limited
28 June 2011	Guwahati	All Assam Small Scale Industries Association	Mr. Anuj Kr. Baruah	President
28 June 2011	Guwahati	Department of Industries and Commerce, Government of Assam	Mr. A.P. Singh	Principal Secretary
28 June 2011	Guwahati	Department of Industries and Commerce Department, Dispur, Government of Assam	Mr. Gaurav Bothra	ACS, Joint Secretary
28 June 2011	Guwahati	Department of Industries and Commerce Department, Dispur, Government of Assam	Ms. Neera Daulapur	ACS, Special Officer
28 June 2011	Guwahati	Department of Assam Industrial Infrastructure Development	Er. Himanga Dip Das	Dy. General Manager(HQ)
28 June 2011	Guwahati	District Information Centre	Mr. Prabir Kakoti	General manager

Annexure II

List of Short Term Courses

List of Short Term Courses at TRTC Guwahati		
Name of the Course	Duration	Intake
Certificate Course in Manufacturing Technology	6 Months	25
Certificate Course in Mould Design with CAD/CAM	6 Months	25
Basic course in welding	6 Months	25
Certificate Course in Electrical Maintenance	6 Months	25
Certificate Course in Mechanical Maintenance	6 Months	25
Certificate Course in Advance Welding	6 Months	25
Certificate Course in CNC Technology	3 Months	25
Certificate Course in Computer Hardware Maintenance & Networking	3 Months	25
Certificate Course in Metrology	2 Months	25
Certificate Course in Auto CAD	2 Months	25
Certificate Course in Motor Cycle Service & Repairing	2 Months	25
Certificate Course in Electrical House Holding Equipments Repair & Maintenance	1 Month	25
Certificate Course in Basic Industrial Wiring	1 Month	25
Certificate Course in Plumber	1 Month	25
Certificate Course in Master CAM	4 Weeks	25
Certificate Course in Solid Works	4 Weeks	25
Certificate Course in Advance Auto CAD	4 Weeks	25

Annexure III

Training Equipment

Machine Type	Make	Model	Max Job Wt / Specifications	Accuracy	Year of Installation
Milling	Vertical Milling Machine	BFW	220X400X820	±0.1 mm	2007
	Vertical Milling Machine	GMT	200X400X750	±0.1 mm	2004
	Vertical Milling Machine	Battliboi	500X400X1000	±0.1 mm	2010
	Vertical Milling Machine	BFW	500X500X500	±0.1 mm	2007
	Universal Milling Machine	GMT	200X400X750	±0.1 mm	2004
	Horizontal Milling Machine	GMT	200X400X750	±0.1 mm	2004
	Horizontal Milling Machine	Battliboi	200X400X750	±0.1 mm	2007
CNC	CNC Milling Machine	Dekel Maho 63V	630X500X500	±0.05	2002
Surface Grinding	Surface Grinding Machine	Praga	175X200X600	±0.05	2004
Surface Grinding	Surface Grinding Machine	HMT	200X275X1000	±0.05	2007
Surface Grinding	Surface Grinding Machine	Parkson	600X300X400	±0.05	2011
Cylindrical Grinding	Cylindrical Grinding Machine	HMT	125X800	±0.05	2004
Cylindrical Grinding	Cylindrical Grinding Machine	HMT	260X800	±0.05	2011
Lathes	Conventional Lathe Machine	HMT	520X1000	±0.05	2009

	Conventional Lathe Machine	HMT	440X1000	±0.05	2009
	Conventional Lathe Machine	GMT	400X1000	±0.05	2004
	Conventional Lathe Machine	Parkson	400X1000	±0.05	2009
	CNC Lathe Machine	Guild Master 400E	400X570	±0.05	2002
	Tool & Cutter Grinder	Praga	600X150X100	±0.05	2004
Drilling	Shaper Machine	-	500X500X400	±0.05	2003
	Radial Drilling Machine	Battliboi	100X1000	±0.05	2007
Drilling	Pillar Drilling Machine	-	40X1000	±0.1	2007
Drilling	Bench Drill Machine	-	19X300	±0.1	2003
Drilling	Power Hacksaw Machine	-	440X200	±0.1	2003
Grinder	Pedestal Grinder	-	300X25	±0.1	2003
CNC	CNC wire EDM machine	Electronica	400X300X250	±0.1	2003
	Rectifier welding Machine	-	400 Amp.	±0.1	2010
	Arc welding AC Machine	-	440 Amp.	±0.1	2010
	TIG	-	200 Amp.	±0.1	2011
	MIG	-	600 Amp.	±0.1	2011
	Gas Cutter	-	Standard	±0.05	2011



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Strategic Assessment of MSME Tool Rooms

As Is Assessment Report – CITD Hyderabad

Prepared for

**Micro, Small and Medium Enterprises
Umbrella Programme**

giz Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH



Knowledge Partner:



Grant Thornton

Contents

	Page
Abbreviations Used	5
Executive Summary	7
Introduction	9
Chapter I - Organisational Profile	11
Chapter II - Governance, Management Systems and Processes	14
Chapter III - Organisational Assessment	18
Chapter IV - Overview of Local Business Environment from Tool Room Perspective	33
Chapter V - Inclusive Growth underlined by Social Impact	36
SWOT	38
Conclusion	39
Annexure I - Details of Visits	40
Annexure II - Equipment Installed	41
Annexure III - Training Courses	43
Annexure IV - Training of Personnel	46

Table 1: Key Challenges and constraints	8
Table 2: Profile.....	11
Table 3: Annual Targets.....	15
Table 4: Service Mix of CITD Hyderabad	18
Table 5: Service - Sector Mix of CITD Hyderabad	19
Table 6: Sector mix of revenue from production of services.....	19
Table 7: Training Income from various courses	21
Table 8: Spread of production services during last 5 years, percentages based on values.....	24
Table 9: Industry Break up of CITD Hyderabad	25
Table 10: Facility Break up of CITD Hyderabad	26
Table 11: Power Back up.....	27
Table 12: Personnel.....	28
Table 13: Retention	28
Table 14: Net worth trend over 5 years	30
Table 15: Government Grants	30
Table 16: Net worth without government grants.....	30
Table 17: Trend of Income and Expenditure	31
Table 18: Backward Linkages	34
Figure 1: Organisation Chart	13
Figure 2: Sector mix of revenue from production of services	20
Figure 3: Number of persons trained.....	21
Figure 4: Training Income from various courses	22
Figure 5: Percentage of MSME's served.....	25
Figure 6: Repeat Orders 2010-11	25
Figure 7: Geographic Spread of the Production services supplied.....	26
Figure 8: Break up of Infrastructure.....	27
Figure 9: Profitability and Composition	30
Figure 10: Trend Analysis.....	31
Figure 11: Social Spread of Trainees	36
Figure 12: Gender Spread	37

Abbreviations Used

AICTE	All India Council of Technical Education
CAGR	Compound Annual Growth Rate
CITD	Central Institute of Tool Design
CAD	Computer Aided Design
CNC	Computer Numerical Control
CAM	Computer Aided Manufacturing
D	Dimensional
DANIDA	Danish International Development Agency
DC	Development Commissioner
DG	Diesel Generating
EDM	Electric Discharge Machining
ESPD	Entrepreneurship & Skill Development Programme
FMIS	Financial & Management Information System
FY	Financial Year
GFR	General Financial Regulations
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GOI	Government of India
HOD	Head of Department
HRD	Human Resource Development
HT	Heat Treatment
ISO	International Standards Organisation
IT	Information Technology
ITI	Industrial Training Institute
IMTEX	India Metal-cutting Machine Tool Exhibition
IITF	India International Trade Fair
L 1	First Lowest
M/C	Machine
MIS	Management Information System
MoMSME	Ministry of Micro, Small and Medium Enterprises
MSME	Micro, Small and Medium Enterprises
NTTF	Nettur Technical Training Foundation
OEM	Original Equipment Manufacturers
PG	Post Graduate
SOP	Standard Operating Procedure

Executive Summary

Tool Room is the backbone of manufacturing industry. To assist MSMEs with infrastructure in tool engineering, government set up Central Institute of Tool Design in Hyderabad for design, for training in tool design and manufacturing with the assistance of ILO under United Nations Development Programme. It is operating since 1970. Management of the Institute is vested with Governing Council constituted by Government of India, under the Chairmanship of Development Commissioner, Micro Small and Medium Enterprises. Government of India has invested Rs.43.43 crores. Value of assistance received from ILO in the form of equipment and cost of expatriates to train Indian counterparts has not been taken in project costs.

CITD was the first of series of 10 established by Government of India. Facility installed at CITD includes high end Tool Room machines, CNC milling and turning machines, CNC wire cut machine, Jig Boring Machine, Jig Grinding Machine.

CITD's operating income and expenditure without depreciation in recent years was as below:

Rs. in lakhs

Year	2006-07	2007-08	2008-09	2009-10	2010-11
Income	498.35	542.34	770.52	755.88	776.29
Recurring Expenditure	369.16	382.12	534.22	611.47	631.52
Income minus expenditure	129.19	160.22	236.30	144.41	144.77

Most of the income is from training department. In 2010-11, training generated 82% of revenue, production services generated 5% and the balance was from interest and other miscellaneous sources. In terms of number of units, share of MSMEs in production related services was 84% % in 2010-11. CITD trained 4862 persons in its training programmes.

CITD has well knit management team. However, one of the main reasons for the non-performance of tool room production is lack of manpower with employee strength of 66. Also, understanding is lacking with other employees who are not coming forward to accept incentive scheme within the frame work of the guidelines issued by DC MSME for all Tool-Rooms to motivate employees towards better performance. For reasons mentioned above data is not captured to analyze machine utilization. Utilization of 14 critical / high value machines is 60 to 96 hours per annum during the last four years.

CITD has done well in skill development of industrial workers and imparting practical training to engineers, graduates and diploma holders and carrying out Post Graduate Engineering Education in collaboration with universities or in affiliation with them. Revenue from training was Rs.639.62 lakhs which was 88.84 % of the target of Rs.720 lakhs. It is however not doing well in production. Value of production in 2010-11 was only Rs.36.42 lakhs against a target of Rs.150 lakhs.

Unlike other Tool Rooms, CITD places a greater emphasis on training instead of production. CITD, though not against production of tools, is mainly a Training activity based organisation.

Contrary to any other Tool Room, CITD conducts several Post Graduation Programmes in collaboration with Osmania University and Jawaharlal Nehru University under Industry-Institution Programmes along with collaboration with other organisations like ECIL, Hyderabad, etc. Citing Memorandum of Association the Tool Room points out that CITD can take up limited production of tools subject to the condition that it promotes the training requirements of the Institute and this can be a possible reason for low production from the Tool Room.

CITD has expertise in manufacture of components for defence and their research and development organisation. Currently, there is more emphasis on cost recovery; as a result, even in limited production prime consideration is to go in for jobs which give higher revenues and outreach and impact is has lesser priority.

CITD being a Government of India Society has to work under the guidelines of the Government. But there are areas in which the autonomy built into the system is also not being effectively used. For instance, Governing Council has not been functioning as effectively as it should be.

Some of the key challenges, constraints and solutions are tabulated below:

Table 1: Key Challenges and constraints

<u>Division/ function/ process</u>	<u>Challenge/constraints</u>	<u>Key solutions /ideas</u>
Management Systems	Data on cost estimates and actual costs is not maintained for analyses as production is not treated as an important function.	Design of IT enabled Financial and Management Information System (FMIS) is a requirement. Continual improvement and accountability can be enhanced through the use of FMIS which can be linked to a suitable reward/incentive system. Suitable training and capacity building of the staff is necessary alongside.
Networking with other tool rooms, institutions and alumni	Networking with other tool rooms/institutions is limited, except CEOs meeting once a year. . The tool room does not leverage the network of its alumni to enhance its tool design and production.	Networking with other tool rooms may also be at HOD level, as done for heads of Tool-Rooms which could be more often. It would be useful for sharing experiences. Again IT enabled platform for such networking is essential.
Pricing of services	Industry find price of CITD high and beyond reach of micro and small unit.	Machine hour rates should be reviewed with analysis. 3 shift working would reduce overheads and thus the rates. Govt. could examine reimbursement of discounts allowed to MSMEs like fees of SC/ST trainees

Introduction

Background Information

Tool Room is the backbone of Industry as manufacturing excellence begins with tools, dies and moulds. To foster the growth of Micro, Small and Medium Scale industries in the country, Government of India set up ten Tool Room across the country with state of the art equipment for design and manufacture of tools and for training of manpower in employable skills. Of these, four were set up with the assistance of Government of Germany, three with the assistance of Government of Denmark, two under UNDP and one without any external assistance. These Tool Rooms are set up as autonomous bodies, Government of India societies with DC MSME as the executing agency. The Tool Rooms are now operating for more than 10 years after close of the agreements of external assistance. CITD was the first of these ten Tool Rooms established under UNDP programme.

GIZ is supporting an evaluation study of 10 Tool Rooms. M/s Grant Thornton Advisory Private Limited has been retained as Consultants to carry out the Study. Tasks entrusted to the Consultants are As Is reports of ten Tool Rooms, ranking of ten Tool Rooms, recommendations on improving the performance of the Tool Rooms and an action plan for the same.

Terms of Reference

The consultant team has been tasked to analyse the existing strengths and weaknesses of the ten tool rooms in terms of their management, finances, human resources, technology and infrastructure , as part of the as is assessment of tool rooms that includes the following:

- a) Institutional/organisational development study of the scheme consisting of political economy aspects involving actors, financial flows, management systems and inter-agency issues
- b) stakeholder feedback on existing tool room services from MSMEs and relevant business associations
- c) stakeholder feedback on further requirements from tool rooms by MSMEs and relevant business associations [a,b to be executed in form of a user feedback survey]
- d) training needs of Tool Room personnel
- e) Comparison of services with similar private sector and German facilities.
- f) Best practices from comparable national institutions such as the Nettur Technical Training Foundation (NTTF), Bangalore [NTTF is a private educational trust established with the help of the Government of Switzerland]

Methodology

Data has been collected through secondary research, publicly available information on MSME tool rooms and through a structured questionnaire, filled by the respective tool rooms. Facilities of the tool room was visited and series of meetings and discussions took place with senior and middle

management of tool room, local associations, suppliers, users and non users MSMEs, large client and state government agencies for qualitative assessment.¹

Based on the quantitative information and qualitative assessment, functioning of each tool room has been assessed and analysed to provide actionable recommendations. For improving alignment of tool room services to the strategic goals of government in setting them up through optimum mix of different service and delivery approach, increased revenue, outreach and impact; improved organisational procedures and governance mechanism, technological and human resource development need, enhanced networking etc. Recommendations shall be accompanied by a time bound and cost estimated action plan for the DC-MSME to implement. Cost estimates would refer to requirements of additional machinery or equipment, general infrastructure, staff restructuring and training etc that would be needed to implement the recommendations. In addition, an institutional analysis framework that can be used by the Ministry in future will also be developed.

However, this report is limited to assessment and analysis of tool room functioning and recommendations is part of a separate report.

Structure of the report

Given below is a summary of how the report has been structured:

Chapter I – Organisation Profile: A brief description of CITD Hyderabad

Chapter II – Governance, Management systems and Processes: This chapter assesses the autonomy given to the General Manager of the tool room, processes followed by the tool room defined by the Ministry of MSME and the level of interaction between DC MSME and the tool room.

Chapter III – Organisational Assessment: This chapter assesses the current status of service portfolio, technological infrastructure, marketing strategy, finance, management systems, human resource and its impacts against the stated policy goals.

Chapter IV: Overview of Local Business Environment from tool room perspective: This chapter assesses the location of the tool room and the market potential for it to expand its services. It also analyses the availability of raw material and machinery suppliers in the region.

Chapter V: Inclusive Growth underlined by Social Impact: This chapter analyses the impact made by CITD in all the three areas of training, tooling and dissemination of environmentally friendly technologies to MSMEs.

¹ Complete list of meetings and interview is placed at Annexure 1.

Chapter I

Organisational Profile

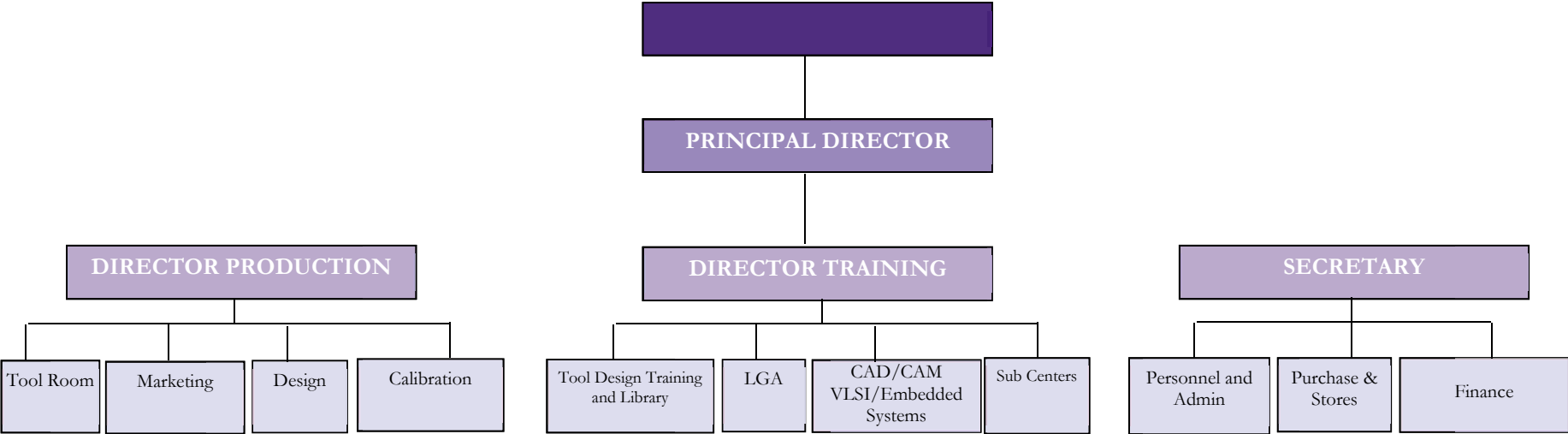
CITD Hyderabad

Table 2: Profile

1.	Project Background	MSME-Tool Room, Hyderabad (Central Institute of Tool Design) was established in 1970 by the Government of India with the assistance of UNDP. CITD is a pioneering institution in the field of Tool Engineering in the Country. The Institute was initially established as a United Nations Development Programme (UNDP) and was executed by International Labour Organisation (ILO). The precision machinery and equipment was donated by UNDP and the faculty were trained abroad in the area of Tool Engineering. The UNDP Experts stayed at CITD for about 5 years and trained officers, faculty & staff of CITD in manufacture and design of tooling.								
2.	External Aid Agency	United Nations Development Programme (UNDP)								
3.	Funding Pattern	<table><tr><th>GOI (In Rupees)</th><th>Aid Agency</th><th>Total (In Rupees)</th></tr><tr><td>43.43 crores</td><td>UN aid value not taken in balance sheet</td><td>43.43 crores</td></tr></table>			GOI (In Rupees)	Aid Agency	Total (In Rupees)	43.43 crores	UN aid value not taken in balance sheet	43.43 crores
GOI (In Rupees)	Aid Agency	Total (In Rupees)								
43.43 crores	UN aid value not taken in balance sheet	43.43 crores								
4.	Organisation Structure	Started as Government Institute, DC MSME, later on converted to Society.								
5.	Objectives	• Training of the technical personnel in design and manufacture of tools, jigs and fixtures, dies and moulds. • Provision of advisory, consultancy and common service facilities to Micro, Small and Medium Enterprises including assistance in the design and development of tools for various processes and projects in low cost automation. • Recommending measures to standardise tools and tooling elements, components of jigs and fixtures, dies and moulds etc. • Production on limited basis of dies and moulds, jigs and fixtures, gauges including manufacturing of precision jobs etc., subject to the condition that the job works undertaken by CITD would promote the training requirements of the Institute. • Training on Low Cost Automation Techniques. • Training in CAD/CAM/CAE/CNC programming								

		• Calibration services in dimensional metrology
6.	Technology	The tool room has the following machinery installed- a. CNC Machines- Wire Cut, EDM's, Lathe machines, Milling machines and Machining Centres upto 5 axis, Universal Grinding Machine. b. Conventional machines- Milling, Turning c. 3D Co-ordinate machines- 3D Co-ordinate and Laser 3D-Co-ordinate Measuring Machines. d. Other Machines- Plastic Injection Moulding Machine.
7.	Training Programmes	a. Long Term Courses (One year or more duration) – 1. Four-Year Diploma Courses in Tool & Die Making, Production Engineering, Automation & Robotics Engineering and electronics and Communication. 2. Post Graduate Courses of one and half to two year's duration in Tool Design, CAD-CAM, Mechatronics, Advanced Machinist, and VLSI. 3. One Year Post Graduate Diploma in CAD/CAM. for Tool Engineering. The above mentioned courses are approved by AICTE. 4. Advance CNC Machinist course of one year duration. b. Short Term Courses (Less than one year) The Short-Term courses address various topics in the field of Tool Engineering, Engineering Software, CAD-CAM-CAE, Mechatronics, Computer Hardware and Plastic Moulding; these include 3D-Modelling, die casting, sheet metal forming. c. Tailor made courses for corporate, sponsored courses and project work training for graduates, post graduates and research scholars. d. Courses for international participants under co-operation programmes of Government of India.

Figure 1: Organisation Chart



Chapter II

Governance, Management Systems and Processes

This chapter assesses the autonomy given to the General Manager of the tool room, processes followed by the tool room defined by the Ministry of MSME and the level of interaction between DC MSME and the tool room. This also assesses the role of GC in the overall functioning of the tool room. This is to analyse how all these factors are contributing or hindering the performance of CITD Hyderabad.

Policy Goals and Direction

Major variation in policy at CITD, from other Tool Rooms, is that production is not a major functional area. Objective 3 (iv) of their Memorandum of Association is as below:

“Production on a limited basis of dies, jigs, fixtures and gauges etc., subject to the condition that the job works undertaken by CITD promote the training requirement in the Institute”

It is a fact that the production levels at CITD are low. But, CITD does not believe that it has to render only training activities. In order to support through production activities, the Tool Room has taken up a no. of critical jobs for development of tools for Aircraft Division of HAL, Kanpur, Ordnance Factories, Defence Establishments, Research Institutes and Public Sector organisations. With an objective to serve MSMEs, CITD supports MSMEs through assistance in Design and Development of tools and providing common facility services.

Except for the revenue from production incidental to training, the Institute does not maintain systems to generate data like, capacity utilisation of machines, breakdown hours, time spent on rework/remaking, no load hours etc. Some of the aspects brought out for other Tool Rooms will not, therefore, be dealt with in this report. Any reference to production will refer to production incidental to training and not to a separate function or department.

CITD has made good progress in expansion of its activities and on financial account and is making cost recoveries. Main source of income is training contributing 82% to revenue, only 5 % coming from production jobs and balance 13 % other sources like interest on deposits of unspent funds.

Characteristics of Core Management Team

Core management team at CITD is well knit. All departments are headed at Director or Deputy Director Levels. However no incentive scheme is in place to act as motivation to perform better basically on account of resistance from employees who would rather accept annual bonus as announced by Government of India for its employees which is also allowed to employees of CITD in the absence of its own incentive scheme. An organised approach to depute personnel for skill and

knowledge development is missing. Such training programmes also act as motivation to perform better.

Annual Targets

There is no formal need assessment undertaken to estimate the market opportunity for its services. Each year annual targets are fixed for training and production which are not linked to the market opportunity or desired level of impact. The targets are both financial and physical. However, there are no targets with respect to the number of MSMEs to be assisted and value of assistance to them. The table below provides details of targets achieved by the CITD in the year 2010-11

Table 3: Annual Targets

Service	Target	Achievement	Achievement %
Training (Physical)	4800 persons	4862 persons	101 %
Training (Revenue)	Rs.720.00 lakhs	Rs.639.62 lakhs	89 %
Production (Revenue)	Rs.150.00 lakhs	Rs.36.42 lakhs	24 %

Source: Action Plan Report submitted by CITD

Management System

The CITD is an ISO 9001–2000 certified organisation. There are Standard Operating Procedures (SoPs) for the following, which are documented and followed at the CITD:

1. Design and execution of training courses
2. Estimation for fees for training courses
3. Quality Plan
4. In-process inspection report (including inspection of re work)
5. Final inspection report
6. Performance (trial) of the tool job completed
7. Inspection report for the raw materials purchased
8. Calibration Control Card for instruments
9. Rejection Report
10. Evaluation of training programmes

While various data are being generated, there is no integration and in many cases limited analysis. E.g. there is no analysis available on trials required for each tool before it is successful. Data on cost estimates and actual costs is not analysed. Design of IT enabled Financial and Management Information System (FMIS) is a requirement. Continual improvement and accountability can be enhanced through the use of FMIS which can be linked to a suitable reward / incentive system. Suitable training and capacity building of the staff is necessary alongside.

Procurement system

For procurement of raw materials for tool making, the tool room needs to follow the procurement guidelines laid down in the General Financial Rules (GFR) calling for quotations and decision making guided by L 1 principle due to which suppliers tend to quote lower rates, sometimes compromising on quality. But this does not affect CITD activities as materials required for training, and production incidental to training can be planned well in advance

For capital goods, an action plan with details of equipment and related costs is prepared in consultation with local GC members and submitted to DC-MSME at the beginning of FY for approval in consultation with Integrated Finance Wing of the MoMSME. It is then ratified by the Governing Council. However, there are instances, when request for funds is submitted Integrated Finance Wing sometime raises objection although it was concurred in by them before. Procedure needs to be simplified and if Integrated Finance has agreed before they should not object at the next and advanced stage. Since the capital goods are also procured on least cost basis, two bid system

should be used. It may be advisable to seek performance bank guarantee from the supplier for a limited period to ensure desired performance of plant and machinery.

Development of a procurement manual covering the operational details on above suggestions would be beneficial to improve efficiency and effectiveness of procurement.

Networking with other tool rooms, institutions and alumni

The CITD can significantly improve networking with alumni which can lead to more business and placements. The training initiative can be scaled up through networking with institutions having infrastructure available with them e.g. ITIs, Polytechnics, state government tool rooms / institutions, etc. There are many such institutions in Hyderabad itself. Networking, through an IT enabled platform, with other tool rooms under MoMSME would also be useful for knowledge and capacity sharing.

CITD has linkages with the following institutions which help it to be known as a centre of excellence for technical education and training and attract international students. These institutes are listed below:

• Bureau of Indian Standards, New Delhi	Member Sub-Committee on jigs and Fixtures
• Fluid Power Society of India, Bangalore	Member
• Indian Institute of Industrial Engg., Mumbai	Member
• Indian Institute of Manufacturing Engg., Mumbai	Member
• Indian Lead-Zinc Association, New Delhi	Member
• Power Metallurgists Association of India	Hyderabad

Interaction with DC MSME

DC MSME monitors the performance of Tool-Room. System is in place under which Tool Room submits the following reports:

a) Performance report, submitted monthly. Against annual targets, following information is submitted for the month and cumulative during the year up to the month of report:

Revenue, expenditure, order position, delivery status, machine utilization, number of trainees and number of MSMEs assisted. Tool Room is required to explain the short falls, if any

System brings out cost recoveries but not the impact and outreach to MSMEs. Instead of monitoring numbers it should bring out the value of assistance provided to MSMEs and highlights of 5 technology related assistance cases. System should also be evolved to monitor customer and trainee feed backs of courses conducted.

b) Annual action plan containing targets and funds needed during the year for recurring and non-recurring expenditure. It is prepared in consultation with local members and submitted to DC MSME who approves the same in consultation with Integrated Finance Wing of the Ministry. It is then put to Governing Council for ratification. Role of Governing Council is limited to local members who are consulted. Ratification is a formality.

c) Monthly status of court cases in which DC MSME is respondent.

d) Annual Report which includes audited annual accounts for placement before the Parliament.

e) Information on innovative work done. This is used for preparation of Cabinet Note on performance of MoMSME.

f) Annual manpower status.

Decision Making

Management of the Tool Room is with the Governing Council. However it meets once in a year, on an average, when convened to pass Annual Accounts and Annual Report. These meetings are generally held away from the Tool Room premises. It is generally the officials from MoMSME and state Govt. who deliberate in the meetings. So Management and the Council have similar composition. Members other than officials are volunteers. It is needed that the structure is revised in favour of greater percentage of independent members with no personal or professional relation with Tool Room e.g. representatives from universities and technology leaders. They could be paid honorarium for their services.

Chapter III

Organisational Assessment

This chapter assesses the current status of service portfolio, technological infrastructure, marketing strategy, finance, management systems, human resource and its impacts against the stated policy goals. This chapter also analyses different factors which are contributing or hindering the performance of CITD Hyderabad in achieving its stated objectives through training programmes.

Overview of Services

The following services are currently being offered by the CITD:

Table 4: Service Mix of CITD Hyderabad

Production		Training ²
Tooling	Job work	
- The tool room manufactures Plastic Moulds, Press Tools, Jigs & Fixtures, Gauges, Extrusion Dies, and Die Casting Dies etc. - Tool Design- Dies & tools, moulds, jigs & fixtures, gauges etc. - Metrology Services (This activity is subject to the condition that it promotes the training requirements of the Institute)	Precision machining and production of components subject to the condition that it promotes the training requirements of the Institute.	Long Term Courses (One year or more duration)- 2 year courses for Masters Degree in collaboration with universities where it is treated as an affiliation and degrees are awarded by the universities. - Post Graduate and Post Diploma courses in Tool Engineering & related subjects and even in Electronics and Communication - Diploma Courses in Tool and Die Making, duration 4 years. - Advance CNC Machinist course of one year duration. Short Term Courses (Less than one year) - Short term training programmes in Tool Engineering and related subjects, CAD/CAM /CAE and Low Cost Automation.

² List of courses conducted by CITD is at Annexure II

		Tailor made courses for corporate, sponsored courses and project work training for graduates, post graduages and research scholars. Courses for international participants under co-operation programmes of Government of India.
In addition to the above CITD also provides Consultancy ³ and Mentoring support to MSMEs to improve productivity by use of better tools and / or better production processes		

The service – sector matrix below indicates the services utilisation by respective sectors:

Table 5: Service - Sector Mix of CITD Hyderabad

Type of Tools/ services	Industry Cluster			
	Auto Components	Research and Development	Electronics	Defence
Moulds		√	√	√
Dies	√	√	√	√
Gauges, Jigs fixtures	√	√		√
Job work		√	√	√
Others		√		√

While the above is the status with respect to the services provided by the CITD, there is no formal need assessment undertaken to estimate the market opportunity for its production services as their approach is to undertake this service only where it promotes training. Each year annual targets are fixed for training and production which are not linked to the market opportunity or desired level of impact.

Contribution

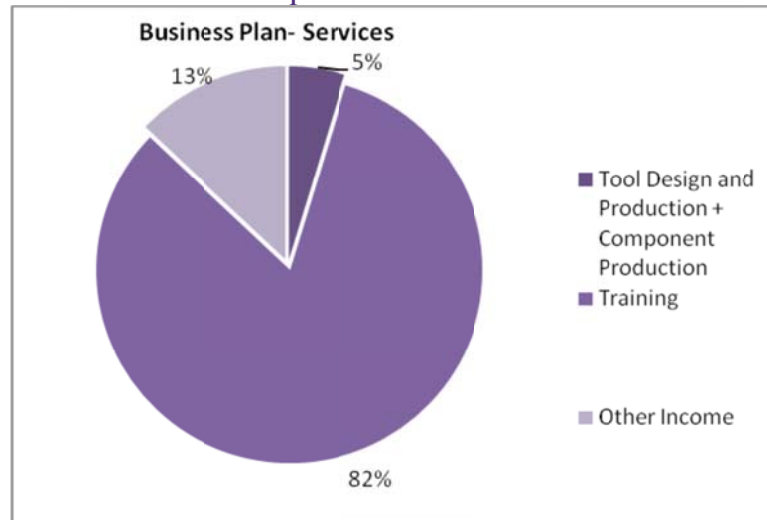
The breakup of revenue contribution for the year 2010-11 from various services is given in the table below:

Table 6: Sector mix of revenue from production of services

Services	Income (in Rupees Lakhs)
Tool Design and Production + Component Production	36.42
Training	639.62
Other Income	100.25
Total	776.29

³ These consultancy services have also extended to external projects like preparing Mini Tool Room Report, Industrial and Design consultancy etc.

Figure 2: Sector mix of revenue from production of services



CITD, mainly being a training institute has maximum revenue coming in from its training services, contributing 82% of revenue from production and training, in 2010-11. Tool design and production is the second contributor with 13%. The contribution of income from training to total income has been more or less stable every year, with more than 75% of the income from the training each year.

The industry feedback on training courses is positive as CITD graduates are considered to have better practical skills as compared to other vocational training institutes and engineering colleges.

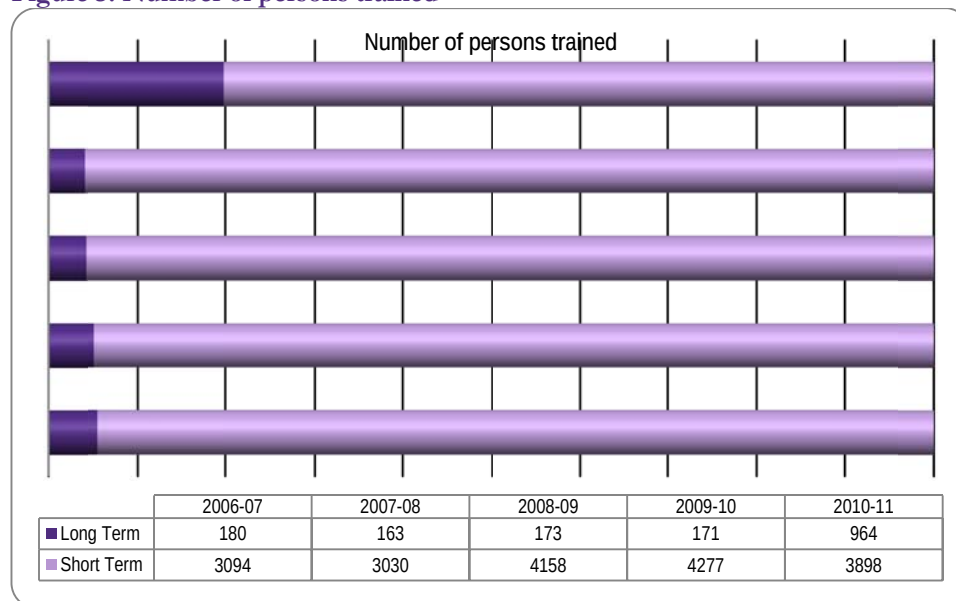
CITD has developed specialisation in, manufacture of press tools. At 5 % share in revenue, 50% of it in value is from press tools, next from components 15% and then mould and die casting dies with 10 % share each. Thirty percent of this revenue comes from defence and research and development.

Industry in around Hyderabad has abundant market for these products but CITD need a policy decision whether to only take orders linked with training programmes or not. This point will be elaborated more in the vision for next 10 years.

Training

The CITD Hyderabad is primarily a training institute and has a very strong reputation in Training. In 2010 – 2011, the CITD trained over 4800 trainees. Trend from 2006-07 to 2010-2011 is given in the diagram below.

Figure 3: Number of persons trained



The trainees for short duration programmes are primarily personnel already working in the Industry and students from the engineering colleges, ITIs or polytechnics who undergo these training courses to improve their practical skills.

In 2010-11, about 20% of total trainees were unskilled persons that were imparted employment oriented skills while the balance 80% upgraded their skills.

Training Income

The training department receives major proportion of its training income from the various short term courses conducted by the tool room. Currently more than 50% of the training income is coming from various short term programmes. Given below is a breakup of the training income received from long term course, short term course and condensed course.

Table 7: Training Income from various courses

Training Courses	2006-07	2007-08	2008-09	2009-10	2010-11
Long Term Courses	90.31	145.32	223.73	282.3	258.05
Short Term Courses	325.07	267.59	428.81	366.2	472.92
Foreigners	7.86	9.77	12.24	14.41	17.16
Total	423.24	422.68	664.78	662.91	748.13

Figure 4: Training Income from various courses



Fee Waiver

There is no fee charged from SC/ST students but their fee is reimbursed by Government of India, MoMSME. Fees from sponsored programmes are paid by sponsoring organisation. In 2010-11 government promoted another scheme with an intake of 25 in each course of duration varying from 100 hours to 300 hours for which fees were duration dependent and were paid by Government without diluting CITD's earnings.

The sustainability of training is of significant importance however almost 50% of the training income is from Government subsidy / Scholarships. This is welcome but needs a careful watch. What could happen if Governments decides as a policy to discontinue this practice? The cost for each programme is estimated at the time of commencement of the particular programme but comparison with actual costs is not available. Similarly, cost viz-a-viz fee comparison for each course is not maintained which makes it difficult to ascertain sustainability of individual training programmes

Placement and Tracking

The CITD has a 100% placement record for its long term training programmes. Placements are not arranged by the CITD for short duration programmes as these are mostly skill up gradation programmes. The training department sends placement brochures for its long term courses to various industries. Industry recruits the students by conducting on and off campus interviews. Majority of the candidates placed are recruited by MSME, about 83% of placements are in this segment.

Post Placement Tracking

Heads of Departments interact with alumni whenever required. This could also be integrated with the proposed IT based MFIS.

There is tremendous scope to increase the employment linked training programmes given the demand from the industry and potential to leverage available infrastructure, polytechnics and

engineering colleges in the region. The CITD can consider feasibility to offer their highly demanded courses through a network of these institutes.

The CITD has a sub-centre at Vijayawada and an extension centre in Chennai.

There is ample scope to professionalise the training services, from updating of content, development of an outreach strategy, post placement tracking of candidates, use of modern training and pedagogical tools, capacity enhancement of trainers, and industry participation. At present, this is mainly adhoc.

Pricing of Services

Tooling and Job Work

The pricing for any tooling job and production jobs like jigs, fixtures, dies and moulds etc is based on machine hour rates.

The Machine hour rates take into account the following components:

- Expected life of the machinery
- Actual cost
- Operator's cost
- Electricity
- Ground rent
- Maintenance cost
- Cost of consumables

Machine hour rates were fixed with detailed analysis of costs about 15 years back by the Governing Council. Presently Principal Director is authorised to increase these on ad hoc percentage basis of 5 % over the previous year if keeping in view the market trend The machine hour rates were last revised in the year 2006. Pricing policy is as below:

Fixed Formula: Price for metrology services is fixed at Rs.100/- per dimension. A discount of 30% is allowed to MSMEs. If dimensions for a single job are more than 30 a uniform, discount of 30% is allowed to all.

Cost Plus: For Tools, cost is calculated based on estimated hours and the rates of machines involved plus 10% design charges. 10 to 15 % margin is kept while quoting.

Market Determined: This is adopted for machining jobs only according to the time taken and machine hour rates which are fixed keeping market rates in view.

According to the members of the Governing Council, some of which are also customers of the CITD, the prices offered by the CITD for its tooling jobs are high and a reason why many MSMEs do not come to the CITD for tooling.

CITD takes approximately three days to quote the price for an average tool which is reasonable when compared to time taken by private tool rooms. It is necessary that the machine hour rates are revisited based on detailed analysis and benchmarked against the market rates. The depreciation as per written down method for some of the machines would be zero and should be removed as a cost component. Similarly, the manpower cost of CITD is significantly higher than the market which needs to be rationalized. Machine hour rates need to be revisited with detailed calculations of direct costs and indirect costs.

A suggestion is made that to promote MSMEs and still keep CITD's earnings, MoMSME should reimburse discount allowed by CITD to MSME units like fees of SC/ST trainees. This will be examined collectively for all Tool Rooms.

Training:

The cost for each training programme is estimated at the time of commencement of the particular programme but comparison with actual costs is not available. Similarly, cost viz-a-viz fee comparison for each course is not maintained which makes it difficult to ascertain its financial viability for future repetition.

Production Services

CTTC undertakes production activity only to promote training requirement. Marketing of production services is through personal contacts and participation in exhibitions and trade fairs. Concentration is on defence and public establishments.

The CITD has a very effective plan for marketing of its training programmes. In addition to advertising the courses in newspapers and Employment News the training department officials make regular visits to engineering colleges and polytechnics as a large number of students from those institutes take specialised courses. Besides, training calendars are extensively mailed. CITD also uses online medium to advertise about its courses available on its website www.citdindia.org

Client Profile

The major sectors serviced by the CITD are defence research and development organisations, revenue from which forms 50 % of production related services. Next are electronics and electrical industries which together contribute about 22 %. Share of auto component industry only 5 % although it is the most growing industry in the country today with a CAGR of 21%.

The Private Sector has been playing significant role in the defence industry sector as sub contractors and ancillary industry. The private sector mainly has been involved in supply of raw materials, semi-finished products, parts and components to Defence PSUs and Ordnance Factories to a great extent and also to Base Workshops of Army and Base Repair Depots of Air Force and the Dockyards of the Navy. Defence PSUs and Ordnance Factories are outsourcing their requirements from private sector (mainly SMEs) in the range of 20-25% that is where CITD fits in for production of components. Out of this outsourcing, about 25% requirement is met through small-scale sector where CITD could support.

Table 8: Spread of production services during last 5 years, percentages based on values

Products	Share
Moulds for plastics, metal	13%
Press Tools	50%
Jigs, Fixtures	5%
Die casting dies	10%
Gauges	2%
Design & development	5%
Components	15%

Types of Industries Served – MSMEs assisted

The share of MSME customers of CITD in production has been decreasing over the years, with 82% in 2006 – 07 and 72% in 2010 – 11. The interactions with the customers of CITD cited long

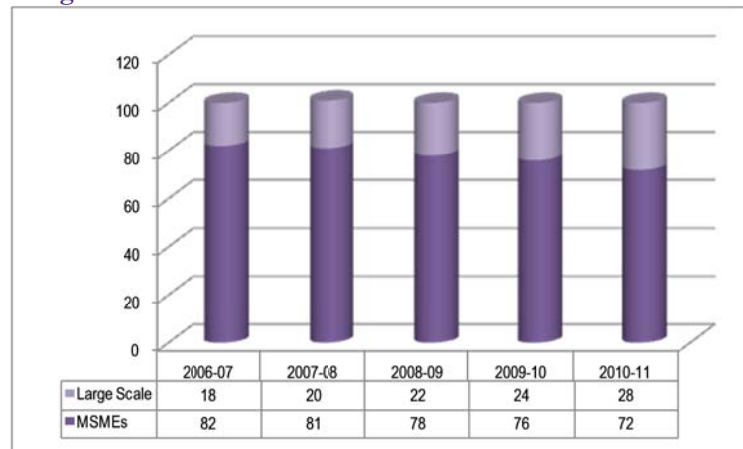
and non reliable delivery schedule as major reasons. At the same time, the micro and small scale users suggested that they cannot invest in tool room facilities and depend on locally available commercial tool rooms because the CITD prices are significantly higher. However, they rate quality of tools supplied by CITD to be better than those of local commercial tool rooms. The table below provides trend of share of MSME customers to total customers of the CITD

Table 9: Industry Break up of CITD Hyderabad

Type of Industry	2006-07	2007-08	2008-09	2009-10	2010-11
MSMEs	82%	81%	78%	76%	72%
Large Scale	18%	19%	22%	24%	28%

The share of MSMEs and large enterprises number wise is indicated in the bar chart below

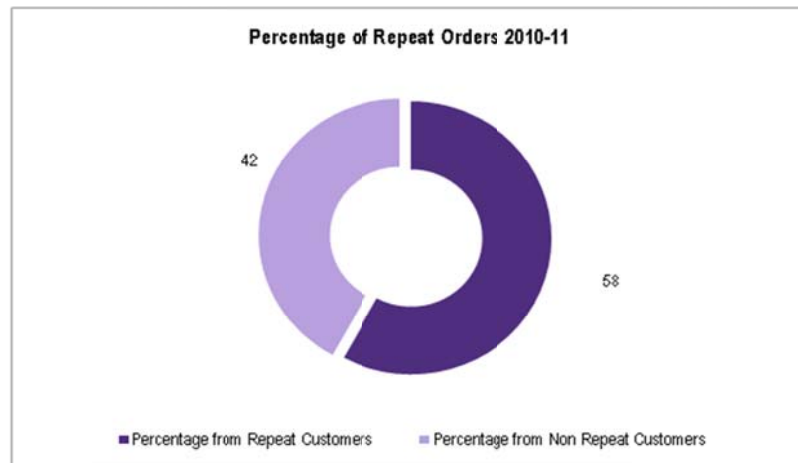
Figure 5: Percentage of MSME's served



The above data is based on numbers served. Value wise data for production services rendered to MSMEs and others is not maintained. Number wise CITD is serving MSMEs well. Comparison by values also needs to be undertaken for a clearer picture on outreach and impact.

Proportion of Repeat Orders

58% of the CITD's tooling orders come from repeat customers, which is an above average performance when compared with other MSME Tool Rooms

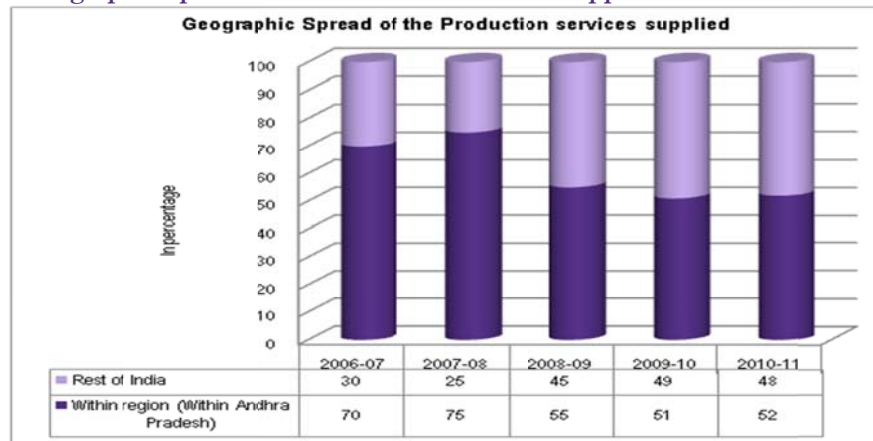


The figure, thus, indicates that CITD is able to retain customers.

Geographic Spread of the clients for tooling services

As indicated in the chart below, while majority of the customers of the CITD are from Andhra Pradesh, their share has been rapidly decreasing. It was 70% in 2006-07 which has come down to 52% in 2010-11. This may be a cause of concern as the tool user industry in Andhra Pradesh is quite significant and servicing local customers is usually easy and lucrative. In addition there is significant potential for impact as there are thousands of MSMEs in the region.

Figure 7: Geographic Spread of the Production services supplied



Although on a low level of activity, majority of CITD services are for regional development, falling trend in share of customers' needs attention.

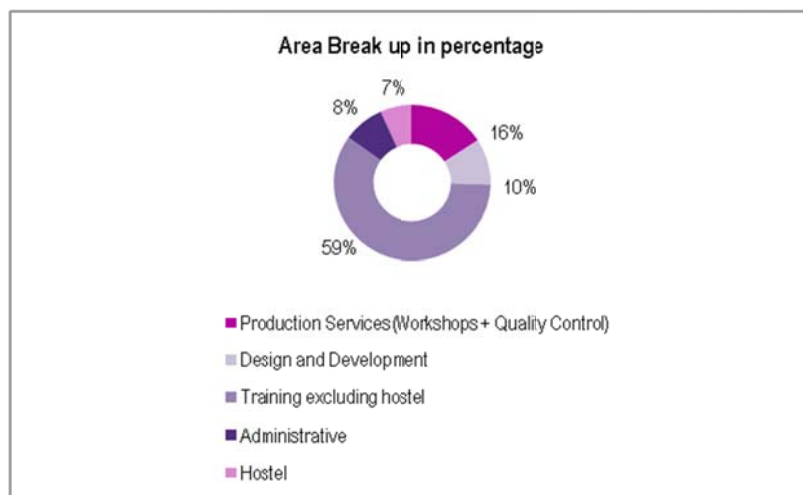
Physical and Technical Infrastructure:

Physical Infrastructure

CITD is located in the heart of capital city of Andhra Pradesh, Hyderabad. The total built up area of CITD is 11036 square meters. The built up areas for the various departments is given below:

Table 10: Facility Break up of CITD Hyderabad

Facility	Area in Square Meters
Production Services(Workshops + Quality Control)	1596.00
Design and Development	980.00
Training excluding hostel	5988.00
Administrative	850.00
Hostel	677.00
Other amenities	945.00
Total	11036.00



Building infrastructure is adequate for CITD's current activities and intended objectives. Institute has taken up construction of a New Diploma Block with a plinth of 1700 Square meters on each floor. The new building will come up in 4 floors in a phased manner. There is sufficient land available with CITD for its future expansion.

Utilities:

CITD has an electrical sub-station, an air conditioning plant, submersible pump and overhead tank for water supply. Power supply is from Andhra Pradesh State Electricity Board which is generally satisfactory. CITD has power back up which can feed all the critical equipment in case of power cuts. Power position is as below:

Table 11: Power Back up

Capacity	Flexibility for use
Connected Load at Hyderabad: 1050 KVA	Enough for whole plant
Connected Load at Vijayawada Sub-Centre: 80 KVA	Enough for whole plant
DG Sets 400 KVA	100 % back up on important machines as needed

Equipment in Production Related Services Sections:

Under ILO, CITD was equipped with high-tech equipment needed at that time. Subsequently, the Plant and machinery has been augmented and upgraded from time to time.⁴

Appropriateness of Technology

Although production is not treated as a separate entity at CITD, it has all the equipment which other Tool Rooms have, and some cases even better. As an example, in CNC milling it has a 5-axis Vertical Machining Centre from Bridgeport USA, which has an accuracy of 5 microns and can machine a part as heavy as 900 kg. Such expensive machines are being used only for about 90 hours in a year during the last 4 years. If only training values are to be maintained a much cheaper machine can be made available which will have same features for handling complex and accurate jobs by

⁴ List of high technology machines is given in Annexure III

CNC programming on similar controls. Difference will be in weight of parts and depths of cut and feeds which are not so crucial from pedagogical angle. There are other machines which production Tool Rooms would be proud to own, like AGIE Wire 5 Axes EDM, Kallenberger cylindrical grinding, Carl Zeiss ULM & CMM, Hardinge lathe, Kent precision surface grinder and others. The available equipment at CITD has the capacity to meet present majority demands with respect to accuracy, complexity and physical size of tools. It has high end hardware and software for CAD/CAM/CAE.

CITD need not take up production of tools and other products like a Production Organisation. However, the equipment, considering, it's mainly a training based organization could be possibly put to greater use through consultancy and mentoring of MSMEs if not through direct production of tools. This will be elaborated more in the combined report for all 10 Tool Room.

Design Development:

The Design department plays an important role in the success of a tool room. Its services include product design and tool design before the tools are taken up for production. CITD has well equipped design labs, both hardware and software being used mainly for training purpose.

Human Resources:

CITD Hyderabad has strength of 56 employees. In addition to the General Manager who is the Chief Executive, CITD has the following personnel:

Table 12: Personnel

Designation/ Department	Director/Secretary	Dy. Director	Assistant Officers	Engineers	Technicians	Others
Administration	1		4			20
Training	1	4	1	9	15	
Sub-Total	2	4	5	9	15	20
Total	55 (56 including Principal Director)					

Table 13: Retention

Total number of employees	Number of years at CITD					Number of employees undergone technical training
	20 years and above	15 – 20 years	10 – 15 years	5 – 10 years	Less than 5	
56	48	1	2		5	Only one Director and two Deputy Directors were deputed to Switzerland which was quite some time back

Manpower mix at CITD is adequate both with regards to the numbers and the levels.

A large number of trainees are engaged in production related jobs which keeps manpower costs low and gives hands on practice to the trainees. CITD also employs a large number of operators on contract as and when needed and at levels needed, which is cheaper as it costs Rs.6,000/- to Rs.10,000/- per month against Rs.20,000/- to Rs.35,000/- which CITD may have to pay in case of regular employees. It is a good policy decision consciously taken by the CITD management.

Skill up gradation /capacity building need

Skill and knowledge development programmes are needed for existing employees. Apart from acquiring new skills and knowledge such programmes affect employees' motivation. But, presently, there is no system at CITD to organise skill development for technicians and executive development programmes

Incentive System

Government of India has allowed for a performance linked incentive scheme which has been liberalised from time to time, last being in 2010. Management wanted to introduce the same, but employees of CITD have not accepted it and currently there is no incentive system in place for the employees. Only bonus as announced by the Central Government for Government employees is paid but it has no link with the individual performance. Developing MIS to establish accountability and contribution of each individual employee and departments will improve effectiveness. It would also enable putting in place a performance linked incentive system which is non-existent at present.

Operational Efficiency

Lead Time and Quality

CITD is known for the quality of its tooling work but lead times tend to be long and price level high for the MSMEs. This is offset, to some extent, by 30 % discount which CITD allows to registered MSMEs who still find the prices high. These trends can be reversed if machine hours rates are revisited with proper analysis.

Machine Utilisation

For reasons mentioned above detailed analysis of machines at CITD could not be done. However, as per information furnished to the Study Team, utilisation of 14 high value machines during last four years has been very low. This amounts to a very low level of utilisation of expensive equipment. For Tool Room like operations, aiming for utilisation of 85 % of capacity on three shift basis is the industry norm.

Improvement of capacity utilisation would ease the pricing level of CITD as CITD prices will come down if this ratio is improved. Machine hour rates will come down if utilisation could be increased as depreciation and other fixed cost will be spread across greater number of machine hours.

Financial Analysis

Analysis has been done of the performance data for the last five financial years from the CITD's Annual Reports made available for the following indicators:

1. Net worth
2. Profitability analysis
3. Trend of income and expenditure

Net worth

The net worth of an enterprise is the sum of total equity and retained earnings. Net worth reflects the value of the enterprise, considering it is composed primarily of the money that has been invested in the enterprise since its inception, as well as the retained earnings for the duration of its operation. Net worth of CITD is shown in the Table 13.

Table 14: Net worth trend over 5 years

Particulars	2005 - 06	2006 - 07	2007 - 08	2008 - 09	2009 -10
Net worth	9,73,24,288	13,35,62,408	16,29,63,822	20,65,10,626	22,03,03,507
Year on year increase		37%	22%	27%	7%

The net worth of CITD, Hyderabad has been increasing every year on an average of 23%, which is a healthy sign as it implies an increase in equity or value of the tool room. During the years the tool room was also in receipt of government grants during the year.

Table 14 reflects the trend of government grants being received by CITC, Bhubaneswar:

Table 15: Government Grants

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10
Contribution from GOI	32,500,000	40,000,000	35,000,000	48,000,000	30,000,000

Net worth of the Tool room excluding the government grants received is provided in the table 15:

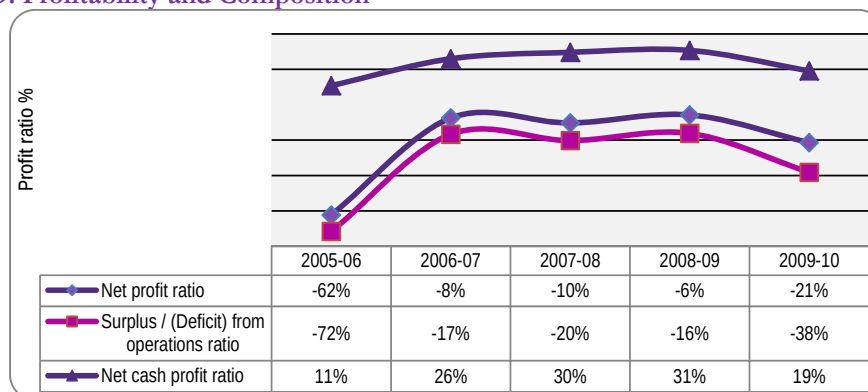
Table 16: Net worth without government grants

Particulars	2005 - 06	2006 - 07	2007 - 08	2008 - 09	2009 -10
Net worth excluding government grants	6,48,24,288	6,10,62,408	5,54,63,822	5,10,10,626	3,48,03,507
Year on year increase		-6%	-9%	-8%	-32%

The Net worth of the tool room has been declining without government grants. The revenues are not able to recover the costs and it is evident that the tool room is in need of aid from the government to sustain its operations..

Profitability and Composition

Figure 9: Profitability and Composition



The Tool Room has been generating a deficit from operations as well as on an overall basis. The deficit ratio was very high in FY 2005-06 at 62% but stabilized around 8% in the three years 2006-09. In FY 2009-10 it shot up again to 21%.

The other income has reduced the deficit from operations significantly but is still not enough to cover the expenses. The deficit from operations on an average for 5 years from FY 2005-2010 has been 33% but due to other income the deficit has been 21%. Thus other income, comprising mostly of interest income has set off the deficit by 12%.

In spite of generating a deficit, the Tool room has still been generating a cash surplus from its operations. The same has been on an average of 23% in the last 5 years FY 2005-2010.

The revenues are heavily dependent on one source - Training. Training revenues contributed to around 78% of the total revenues on an average in the last 5 years. Revenue from sale of finished goods contributed only around 14% in the last five years.

The Tool room did not earn any income from services till FY 2008-09, but in FY 2009-10, the Tool room generated income from labour and processing charges amounting to Rs.14.26 lakhs.

The contribution of sale of goods to total revenues has been declining steadily from 16% in 2005-06 to 15% in 2007-08 and finally 12% in 2009-10. On the other hand, the revenue contribution from other sources has been increasing steadily from 5% in 2005-06 to 8% in 2006-07 and 2007-08, then 9% in 2008-09 and finally 12% in 2009-10. Prime source of other income is Interest income which accounted for 90% in 2009-10.

In FY 2005-06, depreciation accounted for almost half of the total expenses while salary costs and other administrative expenses contributed to the other half. But over the years, the weight has shifted from depreciation to salary expenses, especially on account of the Sixth Pay Commission's recommendation, and the salary costs contributed to 37% of the total expenses in FY 2009-10. On the other hand, share of depreciation towards the total expenses has gone down gradually to 36% in FY 2007-08, 34% in FY 2008-09 and finally to 33% in FY 2010-11.

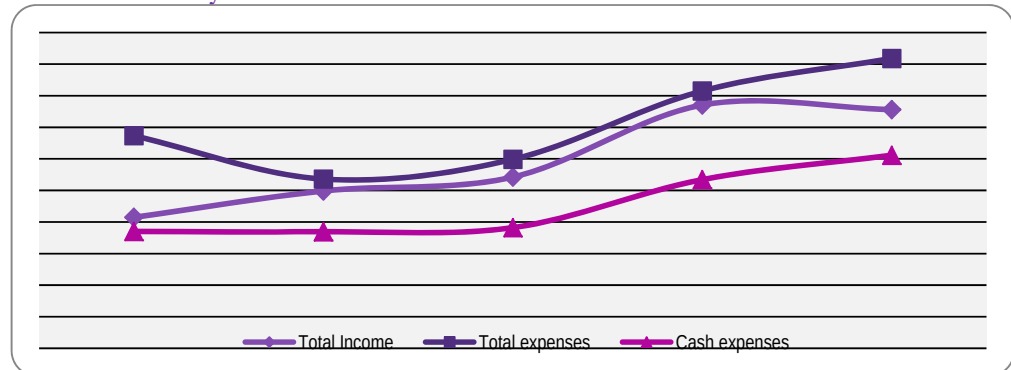
Trend of income and expenditure

Grant Thornton did a trend analysis of the income and expenditure of CITD, Hyderabad based on the audited financial statements provided for the five years ending March 31, 2010. Given below is a diagram reflecting the relationship between the income, expenses and cash expenses:

Table 17: Trend of Income and Expenditure

Particulars	2005 - 06	2006 - 07	2007 - 08	2008 - 09	2009 - 10
Total income	41,474,341	49,834,902	54,234,449	77,052,169	75,587,754
Total expenses	67,323,463	53,596,782	59,833,035	81,505,365	91,794,873
Cash expenses	37,005,495	36,915,254	38,212,721	53,421,592	61,147,328

Figure 10: Trend Analysis



Traditionally the expenses have been in excess of the income generated. In FY 2005-06, the gap between the two was very wide leading to a deficit of Rs.258 lakhs, but in FY 2006-07 the gap reduced significantly as the income started increasing and depreciation halved. Also, the interest income increased from Rs.9 lakhs to Rs.29 lakhs.

Since then, the total income and expenses have grown in proportion to each other. During the FY 2007-08 and FY 2008-09, the income increased at an average of 25% while the expenses increased at an average of 24%. But in FY 2009-10, the expenses increased by a significant 13% whereas the total income reduced by 2%, including revenue from operations which showed a 5% decline.

However, the tool room has always been cash positive as depreciation, forming a major part of the expenses, is a non cash item.

During the year 2007-08 and FY 2008-09, the cash surplus with the tool room increased significantly, but in FY 2009-10, the gap has reduced again on account of lower revenues.

Chapter IV

Overview of Local Business Environment from Tool Room Perspective

This chapter assesses the location of the tool room and the market potential for it to expand its services. It also analyses the availability of raw material and machinery suppliers in the region.

Location and Market Potential

Central Institute Tool and Design is located at Balanagar, Hyderabad in the state of Andhra Pradesh. The tool room is located in the capital city of the state and is well connected by air, rail and road; city is connected to the rest of the country by National Highways—NH-7, NH-9 and NH-202.

The Central Institute of Tool and Design draws a strategic advantage from its location in Andhra Pradesh which has a large concentration of industries with 146142 registered MSMEs. It is located in Hyderabad, one of the prominent industrial cities in India. Hyderabad and its nearby cities have significant concentration of industries which are heavy users of tools, moulds and dies. The major industrial cities are Hyderabad, Vishakhapatnam, Kurnool, Chittoor, Kankinada, Vijayawada, and Warangal in Andhra Pradesh; Bangalore, Belgaum in Karnataka; Chennai, Coimbatore, Madurai, Tiruchirappalli in Tamil Nadu can be effectively serviced by the CITD. In addition to Hyderabad and other cities of Andhra Pradesh, CITD is serving industries in states of Orissa, Tamil Nadu, Gujarat, Karnataka and Uttar Pradesh.

The Supplier Chain

Raw Material Suppliers

Tool Steels used all over the country for making critical parts like cores and cavities of moulds are imported from Germany, Austria, Poland, Japan and Sweden and for less critical applications from Taiwan and China. There is a large network of importers and stockists in the country with major concentration in Mumbai and Chennai. Many major stockists have local presence in Hyderabad which supply the steel from their local stocks or arrange it from their principals in Mumbai and Chennai. CITD however generates a small amount of revenue from production. In 2010-11 it was only 5 % of its total revenue. In absolute terms it was Rs.36.42 lacs and includes components. Their requirements for tool steels are therefore small which are met by local suppliers. Deliveries are prompt even on the same day if local stocks are available otherwise it takes one week if they have to obtain from their contacts in Mumbai. Order placement however takes time as CITD has to go through the normal system of tendering. This in turn affects deliveries to that extent but it does not affect CITD's operations.

Similarly, stockists and agents of standard mould and die sets and their components/ parts have local presence in Hyderabad with limited range, better stocks in Mumbai and Chennai. Some

complex parts like heat tubes for hot runner moulds are not made in the country but imported which are also arranged by these agents / stockists. Again, ease or otherwise of these does not affect CITD.

Machinery Suppliers

There are two kinds of machines at the CITD, conventional and CNC/ precision. The conventional machines are from HMT and other domestic manufacturers. CITD has the know how to service such machine tools in house. The other kinds of machine tools are CNC machine tools and other precision machines which are to some extent produced in the country. However, high end machine tools of this category are imported mainly from USA, Switzerland and Germany. Except minor problems, maintenance of these machines is done by service engineers trained by manufacturers. These machinery suppliers have agents / representatives based in Hyderabad which offers an advantage in prompt servicing and attending to break downs by proper liaison with their headquarters at Mumbai, Chennai and Bangalore where their service engineers are based.

Summary of Backward Linkages:

Table 18: Backward Linkages

Input	Linkage/ Sources
Raw Materials	Stockists are available in Hyderabad, Mumbai and Chennai. Agents and importers in Mumbai and Chennai
Machine Tools	Manufacturers for indigenous machines. Direct imports for imported machines, nearly all such suppliers have agents in India for liaison and service back up. Some imported machines are also available in rupee payment in India from agents
Standard Moulds and Die sets	Stockists in Hyderabad, Mumbai and Chennai. Some complex parts like hot tubes for hot runners etc are imported which can be done directly or even by placing orders on agents in Hyderabad, Mumbai and Chennai.
Cutting Tools	Manufacturers and stockists sufficiently present in Hyderabad
Consumables like oils, greases, salts	Stockists in Hyderabad
Spares	From OEMs except for standard spares like bearings
Specialised Maintenance/ Servicing of CNC Machines	By the machinery suppliers. In case of imported machines this is provided by agents of the foreign suppliers through annual Maintenance Contracts or on visit basis which is preferred by CITD. Service agents are based at the headquarters of the agent and arranged on need basis. Agents of a few foreign principals/suppliers have their branch offices or liaison offices in Hyderabad which is an advantage for close liaison with service engineers and cuts down time for attending to the break down

Growth and Presence of Private commercial Tool Rooms

Hyderabad has a mushroom growth of private commercial Tool Rooms. Many of them are MSMEs. All India requirement of tools in the country is Rs.13225 crores. There is no formal data on tooling requirement of the region (CITD does have to stick to the region any way). According to the member of the Governing Council and representatives of industry there is huge requirement of tools. CITD or for that matter Government Tool Rooms cannot meet the requirement and private Tool Rooms must play an effective role. It is here that CITD must play its role and act as a catalyst. According to them Private Tool Rooms can upgrade their operations if CITD does the 'hand

holding' and assist them in design and with common facilities in machining of complex parts as they do not have high end tool room equipment. CITD with state of the art equipment should assist commercial Tool Rooms in and around Hyderabad to expand their operations. Support in the following areas is needed:

- Design and development of products and tools
- Developments of prototypes
- Making tool parts for which commercial tool rooms do not have the facilities
- Assistance in programming of CNC machines to the extent available with these Tool Rooms
- Assistance in selection of new equipment

Chapter V

Inclusive Growth underlined by Social Impact

CITD has made major impact in the area of training. It trained 4862 persons in its training programmes in 2010-11 resulting in employment creation and skill development. It has promoted development of economically weaker sections as reflected from the following figure.

Gender Spread

CITD's contribution in empowerment of women is presently at low level. In its training programmes, only 1%, 2% and 7% were women candidates in 2008-09, 2009-10 and 2010-11, respectively as shown in the pie diagram below. Being an important segment, CITD could work on annual targets to train women in various training, to improve their representation.

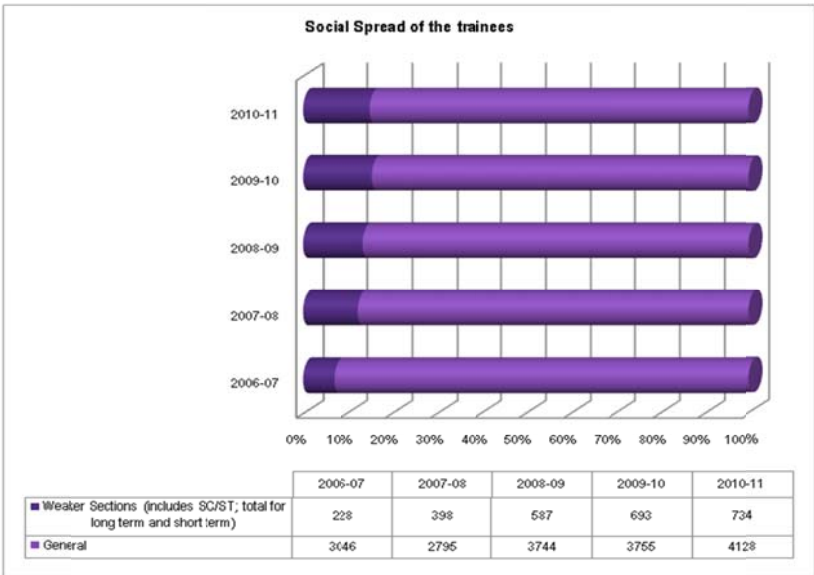
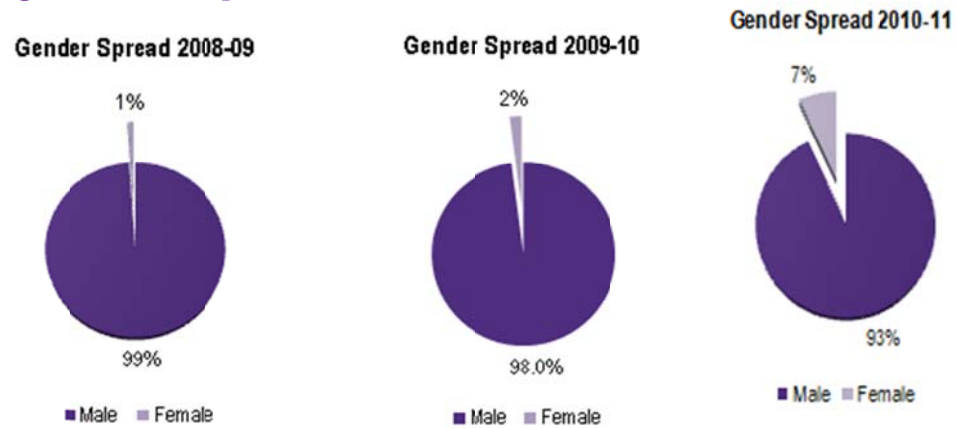


Figure 12: Gender Spread



As visible from the data above; the gender spread in CITD Hyderabad like many other MSME Tool Rooms is skewed in nature.

On other dimensions like environmentally friendly technology and its promotion, not much data was available on its usage and promotion.

SWOT

Strengths

- CITD is the most well equipped commercial Tool Room in the Region
- It is set up with development objectives and offers its services without commercial objectives
- It has expertise in manufacture of high precision components for defence, research and development organisations
- It has earned great reputation for its training programmes
- It has a good training expertise
- It does not depend on Government grants for recurring expenditure.

Weaknesses

- Utilisation of high value equipment is low, averaging 81 hours in a year during the past 4 years.
- Price of tools is high for MSMEs
- Delivery times for tooling services tend to be long
- CITD does not have independence to adopt its own incentive scheme and its employees are not accepting incentive scheme based on guidelines advised by Government for all Tool Rooms
- It does not accept production jobs unless such jobs promote training
- Over the years emphasis has shifted from Tool Design & Manufacture to Training

Opportunities

- Reputation of an institute of excellence in the field of training
- Significant scope for scaling up training and tooling services given the favourable market conditions
- Abundant demand for tooling if CITD wants to undertake such work without linking it with training requirement.
- Tooling demand in 2010-11 was Rs.13225 crores of which 31 % were imported. Demand is estimated to grow at CAGR of 13% (source: TAGMA)
- Huge national requirement of trained manpower
- Government support for capital investment is available

Threats

- Monitoring based on indicators of self sustainability has diluted impact on MSMEs.
- Easy procedures and low customs duties for import of tools. TAGMA's latest survey indicates that 31 % tools were imported in the country in 2010-11.
- Low price levels and faster deliveries of tools from some countries, especially China.
- MSMEs prefer low costs of tools.

Conclusion

CITD has made significant progress and impact in creating skilled manpower and producing precision components. It has contributed to inclusive growth in mainstreaming the weaker sections but impact on empowerment of women needs to be improved. Infrastructure and equipment is well maintained. It has also made significant progress in financial self sustainability; is recovering full costs excluding depreciation and going beyond it. This has been possible primarily due to main thrust on training; however, over the years there is a shift away from promotion of MSMEs with good tooling.

CITD takes up production work, if it is required for promotion of training but still keeps very expensive Tool Room equipment. A conscious decision should be taken. If production is taken up only for promotion of training, then the effective utilisation of heavy duty and high precision machines like Agie Wirecut 5 axes CNC machine which can carry part weighing 0.8 ton and cut it with accuracy of ± 0.005 mm, comes into question. Considering the Institute's advantage in these sophisticated machinery and location; greater focus can also be made on consultancy and mentoring of MSMEs which the tool room is already doing.

The policy direction and monitoring indicators give weight age to self sustainability which needs to be revisited as the impact on MSMEs is of equal significance. Skill development, in which CITD is doing well, is also important but development of MSMEs should not be lost sight of. It is also necessary that the CITD develops an understanding of the current and emerging MSME needs, especially local clusters. A formal survey of the MSME market, relevant to the CITD is needed for this purpose. This would be essential to establish short and long term targets with an eye on the impact.

Annexure I

Details of Visits

Details of visit of GT Team to CITD Hyderabad

Name of the City	Details of Meetings	List of People Met	Designation
Hyderabad	MSME	K.V. Subrahmanyam	Secretary
Hyderabad	MSME	V.Krishnaswami	Director
Hyderabad	MSME	U.KSHIRASAGAR	Deputy Director
Hyderabad	MSME	Shujayat Khan	Principal Director
Hyderabad	Vemulapalli Brothers	Srinivas V.	-
Hyderabad	Prasad ENGG. Enterprises	D.Purna Shankar	Partner
Hyderabad	Jaydeep Metal (Stockists & Dealers)	Ram Singh	Proprietor
Hyderabad	Sri Sai Steels Suppliers	Jugnu Malpani	-
Hyderabad	General Agencies	Kalyan Singh	-
Hyderabad	Reliable Steels	Vikas	-
Hyderabad	Kaalmanns (Group of Companies)	Ashok Kumar Vir	Executive Chairman
Hyderabad	FAPSIA (Federation of Andhra Pradesh Small Industries Associations)	P.Prabhakar Rao	Secretary General
Hyderabad	Research Centre IMARAT	K.Rama Sharma	Scientist 'G' Director Management Services

Annexure II

Equipment Installed

Part F: Equipment:(15 high value machines)						Year of Installation	Number of Hours utilised			
CNC M/cs	Type	Make/Model	Max Job Wt	Axes	Accuracy		2010 – 11	2009 – 10	2008 – 09	2007 – 08
VMC 5 Axes	Bridge port USA	VMC 1000	900 Kg	5 Axes	5 µ	2002	92	90	91	93
VMC 3-axis	Bridge port USA	VMC 2216	340 KG	4 Axes	5 µ	2002	35	30	32	30
Wire EDM	Agicut, Switzerland	Classic 3	800 KG	5 axes	±0.005 mm	2001	94	92	90	91
Wire EDM	Electronica, Pune, India	Ultra cut S1	500 KG	4 axes	±10.0 mm	2005	96	94	79	79
Cylindrical grinding	Kellenberger, gERMANY	COBRA 42	100 KG (MAX.)	--	±0.001 mm	2001	85	80	68	76
Lathe	Hardinge, USA	PRISMO 5	75 KG	--	±1.5 mm	2002	88	81	69	80
3D CMM	Carl Zeisx, GER	OPAL 600	1200 KG	--	(2+L/300)	2002	89	90	88	86
ULM	Car Zeisx, GER	826	25 KG	--	(0.15+L1000)mm	2003	79	65	68	78

Part F: Equipment:(15 high value machines)										
CNC M/cs	Type	Make/Model	Max Job Wt	Axes	Accuracy	Year of Installation	Number of Hours utilised			
							2010 – 11	2009 – 10	2008 – 09	2007 – 08
Slip gauge calibration	MHAR	MU-214 B		--	$\pm 1 \mu$	2003	76	70	74	82
Universal MM	SIP, Switzerland	Kent KGS 615 WMAZ Horizontal spinle	1300 KG	2 axes	1 mm	2003	60	88	66	66
PRECISION SURFACE GRINDING M/C.	Kent KGS 615, Taiwan	KMC 200 SD A	6000 KG	2 axis	$\pm .005$ mm	2004	88	85	85	85
Double calm milling m/c	KADMING, Taiwan	KMC-2000 S	700 KG	3 axis	$\pm .005$ mm	2005	94	84	92	82
VML 800 3A CNC	Lokesh m/c. India Ltd.,	VML 800	200 KG	3 axis	$\pm .005$ mm	2005	90	79	88	78
Vertical m/c. centre	Hardinge, Taiwan	VMC 600	200 KG	3 axis	$\pm .005$ mm	2006	96	86	84	82
Vertical m/c. centre	Hardinge, Taiwan	VMC 600	200 kgs	3 axis	$\pm .005$ mm	2006	93	88	88	87

Annexure III

Training Courses

Course	Duration	Fee/ student Per course In Rs	Support from Ministry of MSME/ Others (State etc.)	Intake	Selection Criterion	Certificati on by	Typical job on placement	Post Place- ment Tracking	Soft Skills	Entry Level Salary per month in Rs
Long Term										
Diploma course in Tool, Die and Mould Making	4 years	1,20,000	NIL	60	Entrance test	CITD	Middle Management	--	10 th Class Pass	12,000
M.E(Mech-CAD/CAM) in collaboration with Osmania University	2 years	1,28,000	NIL	25	-do-	Osmania University, Hyderabad	Management level	--	BE/B.Tech (Mech)	25,000
M.E(Tool Design) in collaboration with Osmania University	2 years	1,04,000	NIL	25	-do-	-do-	Management level	--	BE/B.Tech (Mech)	35,000
M.E(Mechatronics) in collaboration with JNTUUh,	2 years	1,92,000	NIL	25	-do-	JNTUUh, Hyderabad	Management Level	--	BE/B.Tech (Mech) ECE/EEE/ EIE	30,000

Course	Duration	Fee/ student Per course In Rs	Support from Ministry of MSME/ Others (State etc.)	Intake	Selection Criterion	Certificati on by	Typical job on placement	Post Place- ment Tracking	Soft Skills	Entry Level Salary per month in Rs
Hyderabad									Automobile Engg.	
Advanced Tool Makers Course	2 years	28,000	NIL	30	-do-	CITD	Supervisory level	--	ITI(Machinist/ Turner /Fitter)	12,000
Diploma Course in Tool Engineering	2 years	27,000	NIL	50	ITI marks	CITD	Supervisory level	--	ITI(Machinist/ Turner/ Fitter)	12,000
Advanced Machinist Course	2 years	Sponsored programm	NIL	100	Entrance	Govt. of Jhar-khand & CITD	Operator	--	10 th Class Pass	6,000
Post Graduate Diploma in Tool Die and Mould Design	1½ years	60,000	NIL	60	Entrance Test	CITD	Management level	--	BE/B Tech(Mech)	25,000
Post Graduate Diploma in CAD/CAM for Tool Engineering	1½ year	66,000	Nil	40	Counselling on marks	CITD	Management level	--	BE/B Tech(Mech)	
Post Graduate Diploma in Mechatronics	1½ year	60,000	NIL	40	Counselling on marks	CITD	Management level	--	BE/B.Tech (Mech) ECE/EEE/ EIE Automobile Engg	
Post Diploma in Tool Design	1 year	26,000	NIL	60	Entrance Test	CITD	Middle Management level	--	DME/LME	
Advanced CNC machinist course	1 year	12,500	NIL	60	ITI Marks	CITD	Supervisory level	--	ITI(Machinist/T urner/ Fitter)	
Short Term										

Skill Development programmes; Fitter/Turner/Quality Systems and Metrology/ Basic Pneumatics & Hydraulics/ CNC programming and Machining	1 to 6 months	15,000	15,000	25	ITI	CITD	--	--	ITI(Machinist/Turner/ Fitter)	---
Skill Development programmes; Fitter/Turner/CNC programming and Machining	1 to 3 months	15,000	15,000	25	X std/ITI	CITD	--	---	10 th Class Pass/ITI(Machinist)	--

Annexure IV

Training of Personnel

Sl. No.	Designation	Number	Subject
1	Manager Training	1	Operation of CNC Machines and Programming with CAD/CAM
2	Assistant Manager Training	2	
3	Assistant Manager Production	1	
4	Assistant Manager Design	1	
5	Assistant Manager Heat Treatment	1	
6	Design Assistant Grade I	1	Computer Aided Design
7	Design Assistant Grade II	1	
8	Technicians Grade I	22	Operation of CNC Machines
9	Technicians Grade II	15	
10	Technicians Grade III	20	



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Strategic Assessment of MSME Tool Rooms

As Is Assessment Report – IGTR Indore

Prepared for

Micro, Small and Medium Enterprises

Umbrella Programme



Knowledge Partner:



Grant Thornton

Contents

	Page
Abbreviations Used	5
Executive Summary	7
Introduction	10
Chapter I- Organisational Profile	12
Chapter II- Governance, Management systems and Processes	14
Chapter III- Organisational Assessment	18
Chapter IV- Overview of local Business Environment from Tool-Room perspective	32
Chapter V- Inclusive Growth underlined by Social Impact	34
SWOT	36
Conclusion	37
Annexure I- Details of visits	38
Annexure II- Production Equipment	39
Annexure III- Training Equipment	40
Annexure IV- Training Courses	42

Table 1: Brief.....	12
Table 2: Annual Targets and Achievements.....	15
Table 3: Service Mix of IGTR.....	18
Table 4: Service - Sector Mix of IGTR.....	19
Table 5: Break up of Revenue Contribution.....	19
Table 6: Spread of products, percentages based on values.....	22
Table 7: Industry Break up of IGTR Indore.....	23
Table 8: Facility Break up of IGTR Indore.....	24
Table 9: Power Back up.....	25
Table 10: Personnel.....	26
Table 11: Retention Pattern.....	27
Table 12: Capacity Utilisation of 15 Critical/High value Machines.....	28
Table 13: Networth.....	29
Table 14: Government Grants.....	29
Table 15: Networth without government grants.....	29
Table 16: Trend of income and expenditure.....	30
Table 17: Backward Linkages.....	33
Figure 1: Organisation Chart.....	13
Figure 2: Share of Services.....	19
Figure 3: Number of persons trained.....	20
Figure 4: Training Income from various Course.....	21
Figure 5: Spread of Income-Tooling Services.....	23
Figure 6: Repeat Orders 2010-11.....	23
Figure 7: Geographic Spread of the Production services supplied.....	24
Figure 8: Break up of Infrastructure.....	25
Figure 9: Profitability and Composition.....	29
Figure 10: Trend Analysis.....	30
Figure 11: Social Spread of the trainees.....	34
Figure 12: Gender Spread.....	35

Abbreviations Used

AICTE	All India Council of Technical Education
CAGR	Compound Annual Growth Rate
IGTR	Indo German Tool Room
CAD	Computer Aided Design
CNC	Computer Numerical Control
CAM	Computer Aided Manufacturing
D	Dimensional
DANIDA	Danish International Development Agency
DC	Development Commissioner
DG	Diesel Generating
EDM	Electric Discharge Machining
ESPD	Entrepreneurship & Skill Development Programme
FMIS	Financial & Management Information System
FY	Financial Year
GFR	General Financial Regulations
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GOI	Government of India
HOD	Head of Department
HRD	Human Resource Development
HT	Heat Treatment
ISO	International Standards Organisation
IT	Information Technology
ITI	Industrial Training Institute
IMTEX	India Metal-cutting Machine Tool Exhibition
IITF	India International Trade Fair
L 1	First Lowest
M/C	Machine
MIS	Management Information System
MoMSME	Ministry of Micro, Small and Medium Enterprises
MSME	Micro, Small and Medium Enterprises
NTTF	Nettur Technical Training Foundation
OEM	Original Equipment Manufacturers
PG	Post Graduate
SOP	Standard Operating Procedure

Executive Summary

Tool-Room is the backbone of manufacturing industry. To assist MSMEs with infrastructure in Tool Engineering, government set up Indo-German Tool-Room at Indore. It is one of the four Tool-Rooms set up under Indo-German Tool-Room Programme for design and manufacture of tools and training of manpower in employable skills in tool making and allied trades. It is operating as Government of India Society under Chairmanship of DC MSME since 1990. During the collaboration period total investment in the project was Rs.67.01 crores of which Governments of India, Germany and Madhya Pradesh contributed Rs.24.40, crores, and Rs.32.11crores and Rs.10.50 crores, respectively. State of the art Tool-Room equipment is installed at IGTR which includes high end tool machines like jig boring and jig grinding CNC machining centres and CMMs.

IGTR's operating income and expenditure without depreciation in recent years was as below;

Rs. in lakhs

Year	2006-07	2007-08	2008-09	2009-10	2010-11
Income	412.64	619.43	721.99	578.45	662.86
Recurring Expenditure	370.46	534.69	666.07	731.96	622.06
Income minus expenditure	42.18	84.74	55.92	(-) 153.51	40.80

IGTR is making efforts towards cost recovery and has introduced incentive scheme within the framework of guidelines issued by DC MSME to motivate its employees. It has made cost recoveries, without depreciation, except in 2009-10. Another tool of motivation is to depute all categories for skill development and executive development programmes. It is, at present, on a low scale and needs strengthening. Capacity utilization for critical and high values machines is 28%, if capacity is based on three 8 hour shifts and 296 working days (365 – 52 Sundays – 17 holidays), as is the industry norm. It is 47% when capacity is calculated based on two 7.5 hour shifts and 280 working days, as per practice at IGTR. Machine maintenance time is also very high at 17% of hours available. An effective preventive maintenance system is needed. IT based FMIS is needed to integrate the data being captured for analysis and corrective actions.

Training department is comparatively better than the production division. In 2010-11, it contributed 66% to revenue with 17 % employees. In terms of numbers, share of MSMEs in production related services was 21% in 2010-11, value wise their share was only 25%. It trained 4208 persons in its programmes.

IGTR has generated surplus of income over expenditure excluding depreciation since 2006-07 except in the year 2008-09 when expenditure increased in higher proportion than income.

IGTR's objectives are to assist MSMEs of the western region to enhance their competitiveness by providing them high quality tools, common facilities in machining and consultancy in quality and productivity of their products. Equally important object is to train young manpower for the industry and sharpen skills of existing employees from the industry. Earlier it has done excellent work in developing filled seal moulds for pharmaceutical industry which was a challenging job.

Currently, there is more emphasis on cost recovery which has diluted the initial objective of providing assistance to MSMEs and outreach and impact. As a result priority is to go in for jobs which give higher revenues rather than hand holding the MSMEs, especially micro and small units who find IGTR's price level beyond their reach and delivery periods long. To reduce expenditure, expenditure on critical activities like HRD is given a low priority, and training programmes to improve knowledge and skills of employees are not being organised in a systematic way.

IGTR being a Government of India Society has to work under the guidelines of the Government. But there are areas in which the autonomy built into the system is also not being effectively used. For instance, Governing Council does not operate as effectively as it could. For instance, their association in design of training programmes to make them industry oriented and in making the procedures and processes at IGTR to make them more efficient has not been significant.

Some of the key challenges, constraints and solutions are enumerated below:

<u>Division/ function/ process</u>	<u>Challenge/constraints</u>	<u>Key solutions /ideas</u>
Policy goals and direction	Outlined Policy goal for setting up of IGTR is to enhance the competitiveness of MSME through supply of tooling services and skilled manpower. However, monitoring of performance is mainly on financial parameters and not on outreach and impact.	A balanced approach needs to be synthesised so that assistance to MSMEs is not lost sight of while aiming for self sufficiency. Targets for help to MSMEs should be valuebased and not merely numbers
Autonomy of Institution	The IGTR is set up as an autonomous society but is still to a large extent guided by Government policies The decision making body - Governing Council meets once in a year on an average	Setting up one apex body under DC MSME to administer all Tool-Rooms would be examined while consolidating management issues for all 10 Tool-Rooms
Management Systems	Post placement tracking of trainees is not undertaken	Design of IT enabled Financial and Management Information System (FMIS) is required
Breakdown time	Machinery breakdown time is high, 23 % of available hours	An effective preventive maintenance system should be in place
Procurement System	IGTR follows General Financial Rules (GFR) calling for quotations and decision making guided by L 1 principle due to which suppliers tend to quote lower rates, sometimes compromising on quality.	Rate contract system should be considered. Development of a procurement manual would be beneficial.
Networking with other institutions and alumni	There is no networking with other Tool-Rooms except GMs meetings which are usually once in a year. The Tool-Room does not leverage the network of its alumni.	Networking with other Tool-Rooms, also at Heads of Departments level would be useful. IT enabled networking with alumni is needed.

Lead time	The average lead time taken by IGTR is on a higher side and the customers prefer private Tool-Rooms to meet their tooling requirements	Material procurement time should be reduced as also the tool try out times by use of simulations softwares in design.

Introduction

Background Information

Tool-Room is the backbone of Industry as manufacturing excellence begins with tools, dies and moulds. To foster the growth of Micro, Small and Medium scale industries in the country, Government of India set up ten Tool-Room across the country with state of the art equipment for design and manufacture of tools and for training of manpower in employable skills. Of these four were set up with the assistance of Government of Germany, three with the assistance of Government of Denmark, two under UNDP and one without any external assistance. These are set up as autonomous bodies, Government of India Societies, with DC MSME as the Chairman of their governing Councils. The Tool-Rooms are now operating for more than 10 years after close of the agreements of external assistance. GIZ is supporting an evaluation study of 10 Tool-Rooms. M/s Grant Thornton Advisory Private Limited has been retained as Consultants to carry out the Study.

Terms of Reference

Tasks entrusted to the Consultants are As Is reports of ten Tool-Rooms, their ranking, recommendations on improving their performance and an action plan for the same. The Consultant team has been tasked to analyse the existing strengths and weaknesses of the ten Tool-Rooms in terms of their management, finances, human resources, technology and infrastructure, as part of the AS-IS assessment. Terms of reference are as below:

- a. Institutional/organisational development study of the scheme consisting of political economy aspects involving actors, financial flows, management systems and inter-agency issues
- b. stakeholder feedback on existing Tool-Room services from MSMEs and relevant business associations
- c. stakeholder feedback on further requirements from Tool-Rooms by MSMEs and relevant business associations [a,b to be executed in form of a user feedback survey]
- d. training needs of Tool-Room personnel
- e. Comparison of services with similar private sector and German facilities.
- f. Best practices from comparable national institutions such as the Nettur Technical Training Foundation (NTTF), Bangalore [NTTF is a private educational trust established with Swiss help.

Methodology

Data has been collected through secondary research, publicly available information on MSME Tool-Rooms and through a structured questionnaire, filled by the respective Tool-Rooms. Facilities of the Tool-Room was visited and series of meetings and discussions took place with senior and middle

management of Tool-Room, local associations, suppliers, users and non users MSMEs, large client and state government agencies for qualitative assessment.¹

Based on the quantitative information and qualitative assessment, functioning of IGTR has been assessed and analysed to provide actionable recommendations for improving alignment of Tool-Room services to the strategic goals of government in setting them up through optimum mix of services, delivery approach, revenue, outreach and impact; improved governance, technological and human resource development, enhanced networking etc. Recommendations shall be accompanied by a time bound and cost estimated action plan for the DC-MSME to implement. Cost estimates would refer to requirements of additional machinery or equipment, general infrastructure, staff restructuring, raining etc that would be needed to implement the recommendations. In addition, an institutional analysis framework that can be used by the Ministry in future will also be developed.

However, this report is limited to AS-IS assessment and analysis of Tool-Room functioning. Recommendations are part of a separate report.

Structure of the report

Given below is a summary of how the report has been structured:

Chapter I – Organisation Profile: A brief description of IGTR Indore.

Chapter II – Governance, Management systems and Processes: This chapter assesses the autonomy of IGTR, processes followed by the Tool-Room under guidelines defined by the Ministry of MSME and the level of interaction with DC MSME.

Chapter III – Organisational Assessment: This chapter assesses the current status of service portfolio, technological infrastructure, marketing strategy, finance, management systems, human resource and its impact against the stated policy goals.

Chapter IV – Overview of local Business Environment from Tool-Room perspective: This chapter assesses the location of the Tool-Room and the market potential for it to expand its services. It also analyses the availability of raw material and machinery suppliers in the region.

Chapter V – Inclusive Growth underlined by Social Impact: This chapter analyses the impact made by IGTR in all the three areas of training, tooling and dissemination of environmentally friendly technologies to MSMEs.

¹ Complete list of officials met is placed at Annexure I.

Chapter I

Organisational Profile

IGTR Indore

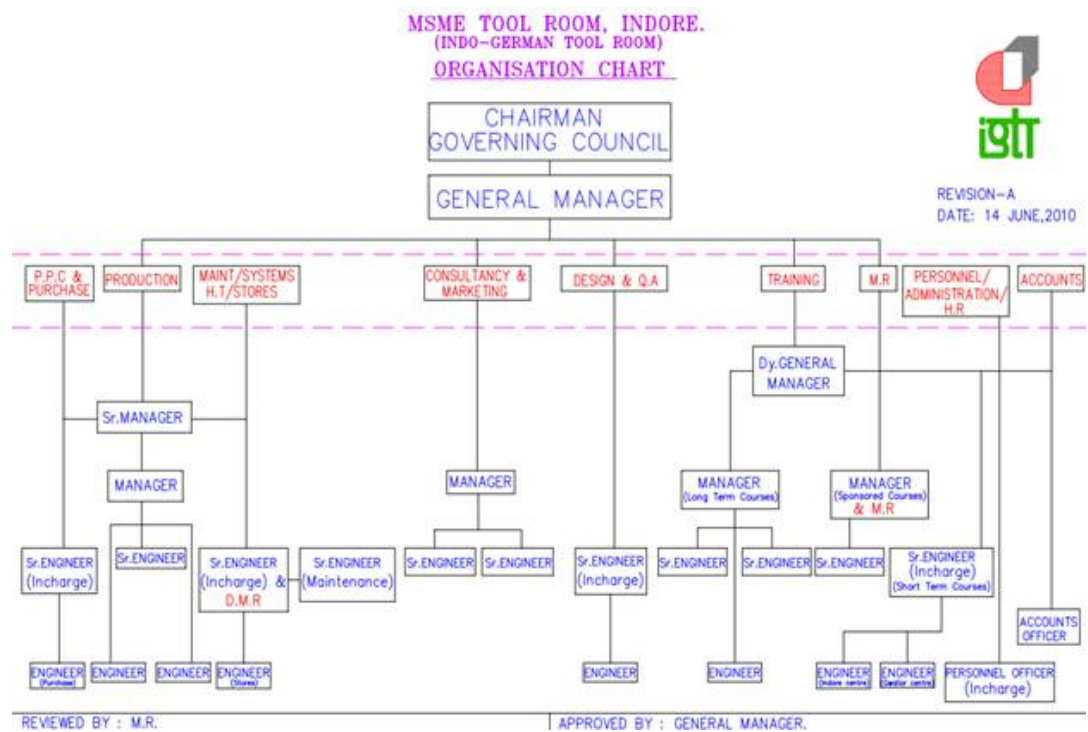
MSME Tool-Room Indore (Indo German Tool-Room, Indore) is located in one of the commercial cities of Madhya Pradesh. It is a Ministry of MSME, Government of India project with assistance from Republic of Germany. Government of Madhya Pradesh provided land, building and infrastructure.

Table 1: Brief

1.	Project Background	IGTR established in 1990. It is one of the leading Tool-Rooms in central part of India. It was established with assistance from Federal Republic of Germany and Government of India.			
2.	External Aid Agency	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)			
3.	Funding Pattern	GOI (In Rupees)	Aid Agency (In Rupees)	Others (In Rupees)	Total (In Rupees)
		24.40 crores	32.11 crores	10.50 crores	67.01 crores
4.	Organisation Structure	Government of India Society – An autonomous body under MoMSME, DC MSME			
5.	Objectives	- To provide technical, advisory and consultancy services for the existing and planned micro/small/medium scale industrial units in the field of design, development and manufacturing tools, dies, moulds, jigs, fixtures, metal casting and related items, production planning, utilization, repair and maintenance of these items. - To provide service facilities at the Tool-Room for design, development, manufacturing and repairing the products mentioned above. - To provide training for tool makers and other allied trades to meet the needs of industries in the field of tools, dies, gauges, CAD/CAM, CNC technology etc. at the Tool-Room and need based in-service training for staff of MSMEs. - To promote, advice, support, encourage and assist training activities in MSME industrial units and to provide in-plant training oriented services to MSME units			
6.	Training Programmes	a. Long Term Courses (One year or more duration) - Advanced Diploma in Tools and Die Making. The duration of the course is 4 years - Certificate Courses of two years duration in the trades of Machinist, Automobile Assembly and Service and Machine Tool Operations			

	Courses of one year duration tool design, tool & dies making, conventional machining and CNC turning and milling b.Short Term Courses of 1 to 3 weeks duration on various subjects. c.Sponsored Training Courses- These are residential training courses on CAD/CAM, pneumatics and hydraulics, machine tool operation and machinist trade.

Figure 1: Organisation Chart



Chapter II

Governance, Management systems and Processes

This chapter assesses the autonomy given to the General Manager of the Tool-Room, processes followed by the Tool-Room, defined by the Ministry of MSME and the level of interaction between DC MSME and the Tool-Room. This also assesses the role of GC in the overall functioning of the Tool-Room. This is to analyse how all these factors are contributing or hindering the performance of IGTR Indore

Policy Goals and Direction

Outlined Policy goal for setting up of IGTR has been to enhance the competitiveness of manufacturing MSMEs through supply of tooling services and skilled manpower. However, monitoring of performance is mainly on financial parameters and not so much on, value of assistance to MSME, outreach and impact. This is due to the present policy which emphasizes financial self-sustainability without much emphasis on the impact on promotion for growth of MSMEs, development of expertise in tool design and manufacture. As a result the IGTR prioritizes jobs which give higher revenues whether from MSME or large units. Monitoring of skill development training courses is in line with the stated objectives

Strategic Shift

Autonomy of Institution

The IGTR is set up as an autonomous society but is still to a large extent guided by Government policies and in some cases even Government rules and regulations. The decision making body, Governing Council, meets once in a year on an average and that mostly coincides with the Annual General Meetings called for approving the annual accounts and annual reports. The private sector members of the GC are not active participants.

Suggestion has emerged during meeting with DC MSME and with stakeholders at IGTR that one apex body under DC MSME to administer all Tool-Rooms would improve governance issues and networking. This would be examined while consolidating management issues for all 10 Tool-Rooms

Characteristics of Core Management Team

Cohesiveness and motivation was apparent within the core management team of General Manager and the next line of Heads of the Departments. All departments are headed at Managers level. Employees are deputed for skill and knowledge development programmes. But this function is at low level mainly to save costs. There is scope for improvement of confidence building and motivation to improve performance.

Annual Targets

There is no formal need assessment undertaken to estimate the market opportunity for its services. Each year, annual targets are fixed for training and production which are not linked to the market opportunity but simply based on ad-hoc enhancement from past performances. The targets are fixed revenue receipts from production related services, and training programmes and number of trainees to be trained. However; there are no targets with respect to the revenue from tooling services as distinct from manufacturing of standard parts and value of services rendered to MSMEs. Substantial part of revenue from production related services should be from manufacturing tools which would be in line with the stated objectives and common facilities for complex machining of tool parts for private commercial Tool-Rooms. Dilution of tool making will dilute the expertise in tool making. It is easy for a Tool-Room to handle standard components/parts but it is not true the other way around. Tool making expertise once diluted takes a long time to recoup.

The table below provides details of targets achieved by the IGTR, level of impact on MSMEs.in the year 2010-11

Table 2: Annual Targets and Achievements

Service	Target	Achievement	Achievement %
Training (Physical)	4000 persons	4208 persons	105
Training (Revenue)	Rs 405 lakhs	Rs 449 lakhs	110
Production (Revenue)	Rs 400 lakhs	Rs 228 lakhs	57
MSME Units to be assisted	400	461	106

Source: Information furnished by IGTR Indore

Management System:

The IGTR is an ISO 9001–2008 certified organisation. There are Standard Operating Procedures (SoPs) for the following which are documented and followed at the IGTR:

1. Tool Design
2. Maintenance
3. Preventive Maintenance
4. Order Processing
5. Rework and Rejections
6. Tool Try Out
7. Customer Complaints
8. Estimation Sheet for Tooling
9. Quality Plan
10. Long-Term Training Courses
11. Short-Term and Tailor Made Training Courses
12. Calibration Control Card
13. Product Deviation/Acceptance Note
14. Rejection Report

ISO system and procedures are followed. Annual audit of 2010 revealed that only a minor non-conformity was raised by the auditors, which was effectively closed.

While various data are being generated, there is no integration and in many cases limited analysis. e.g. there is no analysis available on trials required for each tool before it is successful. Data on cost estimates and actual costs is also not analysed. Post placement tracking of trainees is not undertaken. Design of IT enabled Financial and Management Information System (FMIS) is a requirement. Continual improvement and accountability can be enhanced through the use of FMIS which can be linked to a suitable reward/incentive system. Suitable training and capacity building of the staff is necessary alongside.

Procurement system

Discussion with one vendor brings out a tendency on the part of vendors to quote higher prices as it takes IGTR a month to place the order after opening of tenders and there are delays in getting the payments after supplies are made. Decision making takes longer as IGTR has to follow General Financial Regulations (GFR) and is further guided by L 1 principle. It takes time to make a case to ignore lower offers even hence they do not meet the specifications of requirements. Local suppliers are available for materials like steel to specifications En 8, En 9, En 24, En 31, stainless steels and non ferrous metals. For other tool steel IGTR uses sources in Mumbai, Chennai etc as even the local suppliers depend on them.

Delay in getting the raw materials slows delivery of tools. Being a public institute, IGTR has to adhere to the general financial regulations (GFR) but within that also the process can be made faster with yearly rate contracts. For capital goods, procurement can be planned well in advance. Specification should be elaborate and clear so that competency of the equipment is not compromised on account of L 1 principle. Two bid system takes care of it to some extent.

Development of a procurement manual covering the operational details on above suggestions would be beneficial to improve efficiency and effectiveness of procurement.

Networking with other Tool-Rooms, institutions and alumni

The IGTR can significantly improve networking with alumni leading to more business and placements as many ex-trainees eventually occupy decision making positions for tool planning and training in the Industry. At present there is no formal system to engage alumni. The training initiative can, also be scaled up through networking with institutions having infrastructure available with them e.g. ITIs, Polytechnics, state government institutions, etc. Networking with other Tool-Rooms under MoMSME would also be useful for knowledge and capacity sharing. In its present, it is through meetings of CEOs which takes place once in a year. It should be upped and also extended to HOD level. Again an IT platform for such networking is essential.

Interaction with DC MSME

DC MSME monitors the performance of Tool-Room. System is in place under which Tool Room submits the following reports:

a) Performance report, submitted monthly. Against annual targets, following information is submitted for the month and cumulative during the year up to the month of report:

Revenue, expenditure, order position, delivery status, machine utilization, number of trainees and number of MSMEs assisted. Tool Room is required to explain the short falls, if any

System brings out cost recoveries but not the impact and outreach to MSMEs. Instead of monitoring numbers it should bring out the value of assistance provided to MSMEs and highlights of 5 technology related assistance cases. System should also be evolved to monitor customer and trainee feed backs of courses conducted.

b) Annual action plan containing targets and funds needed during the year for recurring and non-recurring expenditure. It is prepared in consultation with local members and submitted to DC MSME who approves the same in consultation with Integrated Finance Wing of the Ministry. It is then put to Governing Council for ratification. Role of Governing Council is limited to local members who are consulted. Ratification is a formality.

- c) Monthly status of courts cases in which DC MSME is respondent.
- d) Annual Report which includes audited annual accounts for placement before the Parliament.
- e) Information on innovative work done. This is used for preparation of Cabinet Note on performance of MoMSME.
- f) Annual manpower status.

Decision Making

Management of the Tool Room is with the Governing Council. However it meets once in a year, on an average, when convened to pass Annual Accounts and Annual Report. These meetings are generally held away from the Tool Room premises. Also representatives of industry are not found to be taking interest in decision making and it is generally the officials from MoMSME and state Govt. who deliberate in the meetings. Members other than officials are volunteers. It is needed that the structure is revised in favour of greater percentage of independent members with no personal or professional relation with Tool Room e.g. representatives from universities and technology leaders. They should be paid honorarium for their services.

While expectations from IGTR are similar to those from a private commercial Tool Room, it is not allowed similar level of independence.

Chapter III

Organisational Assessment

This chapter assesses the current status of service portfolio, technological infrastructure, marketing strategy, finance, management systems, human resource and its impacts against the stated policy goals. This chapter also analyses different factors which are either contributing or hindering the performance of IGTR Indore in achieving its objective and policy goals of “enhancing competitiveness of manufacturing MSMEs through tooling services and availability of skilled manpower.”

Overview of Services

IGTR Indore is currently offering “Tooling, Job Work and Training services” which are in line with its overall stated objectives. The following services are currently being offered by the IGTR:

Table 3: Service Mix of IGTR

Tooling	Production	
	Job work	Training ²
○ Design manufacture of Press tools moulds, gauges, jigs, fixtures, die-casting and dies ○ Manufacture of Press tools moulds, gauges, jigs, fixtures, die-casting and dies ○ Manufacture of tool parts ○ Assembly and try-out of manufactured tools ○ Repair of tools ○ Inspection and measurement of customer jobs by using 3D-CMM and other instruments	● Job work for heat treatment. ● Precision machining components, mostly for R&D establishments under Atomic Energy Commission ● Component standard parts production ● Common facilities in machining	● 4 Years Duration ○ Advanced Diploma in Tool & Die Making ● 2 Year Duration ○ Certificate Courses in Machinist Trade ○ Certificate Course in Automobile Assembly and Service ○ Advanced Certificate Course in Machinist Trade ● 1 Year Duration ○ Tool Design ○ Tool and Die Making ○ Conventional Machining ○ CNC Turning & Milling ● Short Terms Courses of 1 to 3 weeks duration ● Tailor made skill enhancement courses for Industry
In addition to the above IGTR also provides Consultancy and mentoring support to MSMEs to improve productivity by use of better tools and / or better production processes		

² List of short term and specialised courses conducted by IGTR is Annexure II

The service – sector matrix below indicates the services utilisation by respective sectors:

Table 4: Service - Sector Mix of IGTR

Type of Tools/ services	Industry Cluster						
	Hand Tools	Plastic	Auto Components	Pharmaceutical	Defence	Atomic Energy	Others
Heat Treatment	√	√	√				√
Moulds			√	√			√
Dies	√		√		√	√	√
Gauges, Jigs fixtures			√		√	√	√
Job work			√			√	√
Others			√			√	√

Contribution

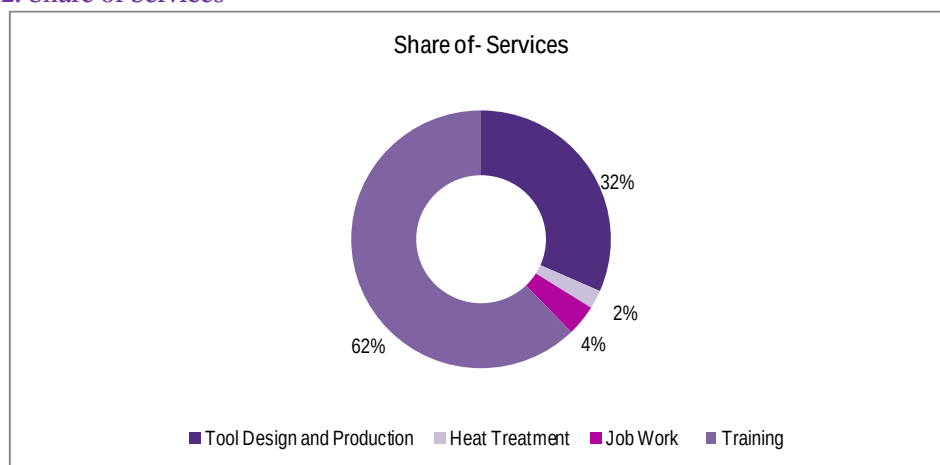
The breakup of revenue contribution from various services is given in the table below:

Table 5: Break up of Revenue Contribution

Services	Income (in Rupees Lakhs) in 2009 – 10
Production related services	214.76
Training	357.89
Others	5.81
Total	578.45

Percentage share of services mix is shown in table below

Figure 2: Share of Services



The maximum revenue is generated by training services in the service mix of the IGTR. Position regarding contribution by training further went up to 67 % with 17 % employees.

IGTR has developed specialisation in form filled seal moulds and blow filled seal moulds for the Pharmaceutical Industry. This is an excellent development work done by IGTR but, unfortunately, it has not been encashed. There should be a huge demand for such moulds. It only needs to be tapped

effectively. IGTR has also developed moulds for pace-maker components. Next to moulds IGTR caters to the needs of auto component industry for press tools of which there is a growing demand. Share of tooling during the last 5 years has been less than 50 %. IGTR should aim for 50 % revenues from production related services and out of that more than 50 % should be from tooling.

Training

The IGTR Indore enjoys strong reputation in Training and there is demand for training courses at IGTR. In 2010 – 2011 the IGTR trained 4208 personnel.

Figure 3: Number of persons trained



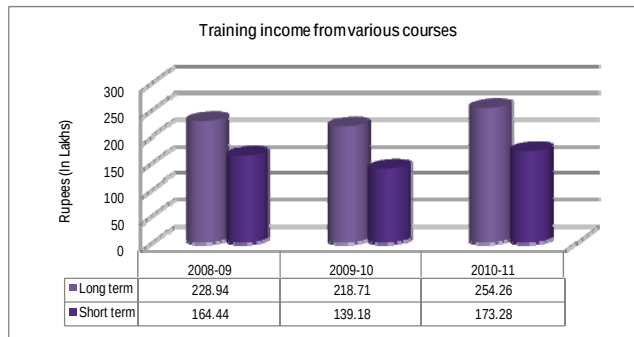
In deviation from other Tool Rooms, IGTR Indore has concentrated on long term courses. Revenue from long term courses is about 60% of total training revenue, out of which two third is from Government sponsored training schemes. While Government sponsored courses are welcome, management of Too-Room should be careful about it. If such skill development schemes are withdrawn or curtailed by the Government Tool Room should be able to fill that gap. Against the backdrop of financial sustainability being the key performance indicator, Tool-Room can increase revenue by expanding short-term courses as there are higher revenue earnings from such courses at relatively less costs. The trainees for short duration programmes are primarily personnel already working in the Industry and students from the engineering colleges, ITIs or polytechnics who undergo these training courses to improve their practical skills.

The students for both the short-term courses and the long-term course are admitted from all over the country but majority (91%) come from within the region showing of regional impact.

Training Income

Major proportion of IGTR's training income is from the various short term courses Given below is a breakup of the training income received from long term course, short term course and condensed courses. Currently, 60% of the training income is from various long term programmes and state sponsored long term programmes but these courses are also cost intensive.

Figure 4: Training Income from various Course



Scholarships and Fee Waiver

There is no fee charged from SC/ST students and from students deputed under ESDP. Fees of such students are paid by MoMSME to IGTR.

Placements

IGTR has a 100% placement record for its long term training programmes. Placements are not arranged by the IGTR for short duration programmes as these are mostly skill up gradation programmes. The training department sends placement brochures for its long term courses to various Industries. The industry recruits the students by conducting on and off campus interviews. Majority of the candidates placed are recruited by MSME, about 60% of placements are in this segment.

Post-Placement Tracking

There is no system of post placement tracking of candidates, thus leveraging the alumni potential for marketing of Tool-Room services.

Pricing of Services

Tooling and Job Work

The pricing for any tooling job and production/job work is calculated on the following formula:

Cost = Machine hour rates X Number of hours on the machine

The Machine hour rates take into account the following components:

- Machine landed cost
- Machine life
- Machine depreciation cost
- Man Power cost
- Electricity
- Machine maintenance cost
- Machine consumables
- Overhead Costs

The machine hour rates were last revised in April 2011.

Training

Long-term courses are subsidised. Cost is calculated based on machining capacity needed at the rates fixed, consumables needed and then the overheads cost fee is fixed. Likewise short-term course costs are

estimated. A system is in place to compare the estimate with actual costs on execution of the course. It is kept in view for corrective measures in future.

Marketing

System

The IGTR has a marketing team three officers and another staff for tooling services. Training programmes are marketed by operational staff of Training Department. Both teams are given annual targets which are communicated to the GC as well as DC office. The progress is reviewed on a monthly basis.

Strategy

Key marketing strategy of IGTR is industrial visits to regular and prospective customers, participation in exhibitions, online marketing through email and website for production services and newspaper advertisement and networking with engineering colleges, industry associations for training services. IGTR website³ receives inquiries sometime but is not very effective.

Constraints

Key challenge faced by IGTR in marketing of its production services is higher cost for simple tools and lack of speed compared to small private tool rooms, absence of strategy based on proper market need assessment and segmentation and inability to encash its reputation of high quality tools specially Form Filled Seal Moulds and Blow Filled Seal Moulds for pharmaceutical industry as a USP.

Client Profile

Given the profile of industry in Madhya Pradesh and its adjoining states, the maximum demand of tooling is for moulds, standard parts and press tools etc for auto component industry. IGTR caters to industries in Indore and nearby Pithampur which is the hub of industrial activity. Many major auto companies have their manufacturing units and ancillaries in Pithampur such as Cummins India, Mahle Engine Components Pvt. Ltd., Eicher Motors, Mahindra, Caparo. Pharma Cluster in Indore is another user of IGTR for plastic moulds. The IGTR has developed expertise in Form Filled Seal Moulds and Blow Filled Seal Moulds, Press Tools, Magnets and Radio Frequency Quadra Poles. The break-up for spread of products, for the last five years is given in the table below:

Table 6: Spread of products, percentages based on values

	2006-07	2007-08	2008-09	2009-10	2010-11
Moulds for plastics, metal	57.10%	15.96%	66.53%	54.01%	42.27%
Press Tools	9.53%	4.52%	19.57%	15.83%	38.05%
Forging Dies, Foundry Patterns/Std. Parts	24.76%	79.24%	13.14%	30.00%	13.65%
Jigs, Fixtures	--	0.15%	--	0.10%	4.27%
Components	0.54%	0.12%	0.02%	--	--
RP, Design, Product Dev	8.09%	--	0.74%	0.06%	1.76%
Others (Heat Treatment)	--	--	--	--	--

³ www.igtrindore.com

Types of Industries Served – MSMEs assisted

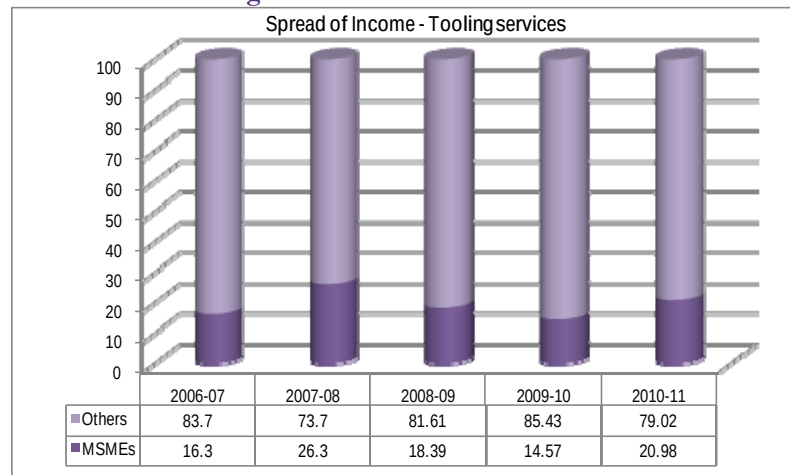
The share of MSME customers of IGTR had increased from 75% to 85% from 2006-07 to 2009-2010 declined to 79% in 2010 - 11. Also, the interactions with the customers of IGTR suggested that most of these MSMEs are medium scale units with many having their captive tool-rooms and come to IGTR when short of capacity. Most of these customers plan to increase their investments in captive tool-rooms and their requirement from IGTR may not grow. They cited long delivery schedule and higher price as major reasons. However, they rate quality of tools supplied by IGTR to be better than those of local commercial Tool-Rooms. The table below provides trend of share of MSME customers to total customers of the IGTR

Table 7: Industry Break up of IGTR Indore

Type of Industry	2006-07	2007-08	2008-09	2009-10	2010-11
MSMEs	16.3	26.3	18.39	14.57	20.98
Large Scale	83.7	73.7	81.61	85.43	79.02

The share of MSMEs and large enterprises in IGTR's revenues is indicated in the chart below.

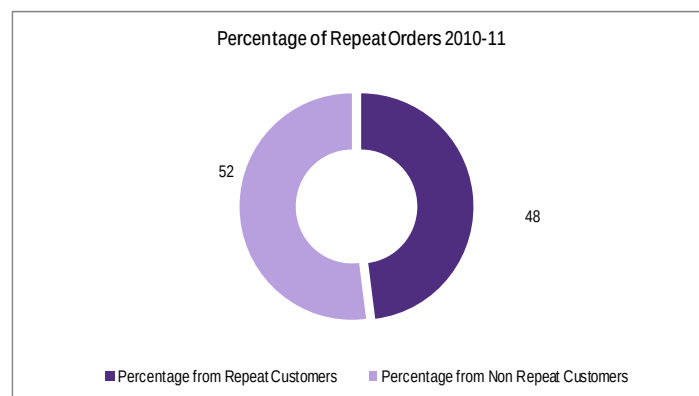
Figure 5: Spread of Income-Tooling Services



Proportion of Repeat Orders

IGTR scores midway on customer satisfaction and retention as reflected in the diagram below. New customers are therefore being identified and attracted.

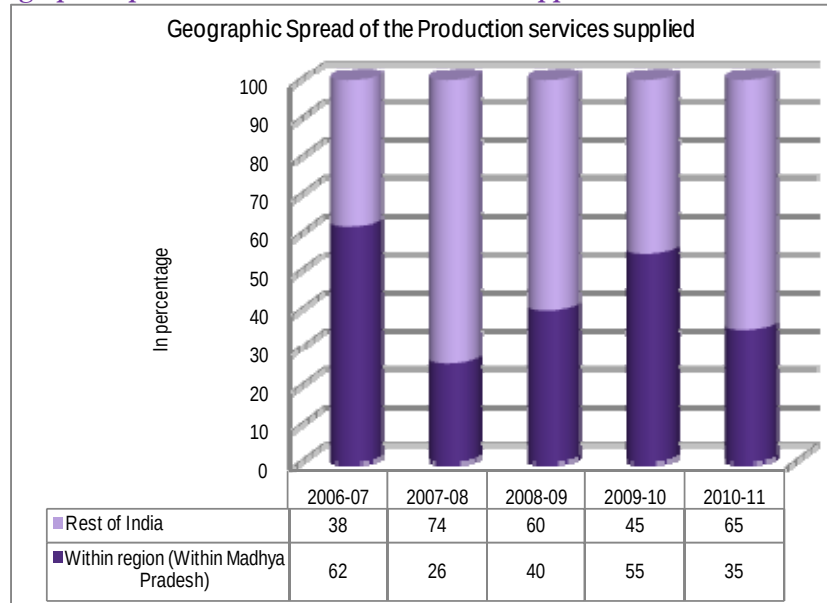
Figure 6: Repeat Orders 2010-11



Geographic Spread of the clients for tooling services

Majority of the customers of the IGTR are from outside Madhya Pradesh; their share has increased over the last five years. It was 38% in 2006-07 which has increased to 65% in 2010-11. This trend emanates from the policy to go where ever more revenue can be earned as targets are based on cost recovery. This may be a cause of concern as the tool user industry in Madhya Pradesh (auto components, plastics, pharmaceuticals etc) especially in Pithampur and Indore is quite significant and servicing local customers is usually more efficient and lucrative. In addition there is significant potential for regional impact on MSMEs in the region.

Figure 7: Geographic Spread of the Production services supplied



Infrastructure

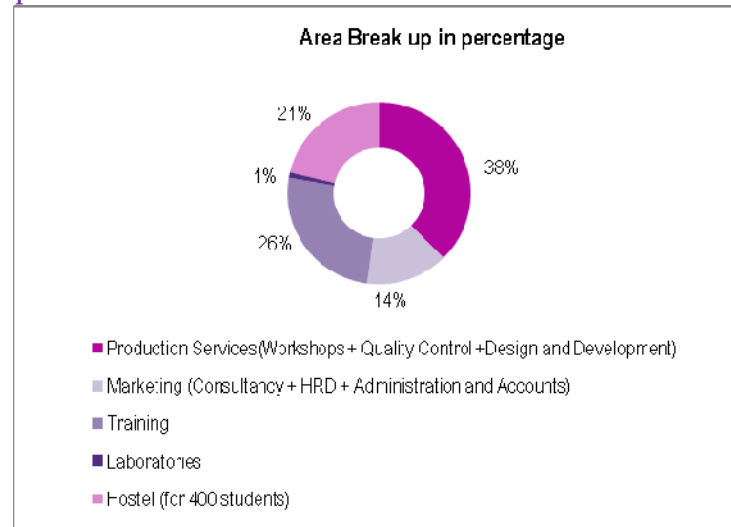
Physical Infrastructure

The total built up area of IGTR is 9210 square meters. The built up areas for the various departments is given below:

Table 8: Facility Break up of IGTR Indore

Facility	Area in Square Meters
Production Services(Workshops + Quality Control + Design)	4400.00
Marketing(Consultancy + HRD + Admin and Accounts)	1700.00
Training	3000.00
Laboratories	110.00
Hostel (for 400 students)	2500
Total	11710

Figure 8: Break up of Infrastructure



Utilities

As regards utilities, IGTR has an electrical sub-station, an air conditioning plant, submersible pump and tank for water supply. IGTR has power back up which can feed all the critical equipment in case of power cut by Electricity Board. They have the following DG sets:

Table 9: Power Back up

Capacity	Flexibility for use
Connected Load	500 KVA for the whole plant
Two DG Sets of 200 KVA and 100 KVA	The system is flexible. It can feed all important machines on priority basis, as selected by the Management.

IGTR depends on outside supplies for welding gases, oils and greases etc. IGTR has its own arrangements for water supply and generation of compressed air. The utilities are adequate and are procured appropriately on need basis.

Equipment in Production Related Services Sections

Under Indo-German Technical Co-operation Programme, IGTR was equipped with high-tech equipment needed at that time. Subsequently, the plant and machinery has been augmented and upgraded from time to time.⁴

Appropriateness of Technology

IGTR has all the equipment to handle design and manufacture of tools needed by the regional industry like, CNC Machines/Machining Centres, CNC EDM and wire EDM machines, Co-ordinate Measuring Machine (CMM) and software packages in CAD / CAM from AutoCAD and Unigraphics. They also have simulation softwares Mould Flow and Hyper Form. For Reverse Engineering IGTR uses HOLOS on CMM. However technology development is a dynamic process and IGTR has to continuously upgrade it to provide an effective service to the Industry.

Discussions with Association of Industry and Industrialists requirements of Industry, specially the Auto Component Industry which will have the highest growth in the coming years, are changing and IGTR should keep pace with it and should augment the facilities with the following:

⁴ List of equipment is in Annexure III

- Upgrade CNC machining operations to 5-axis
- Add laser based technology
- Develop the expertise to manufacture hot runner moulds

Equipment in the Training Department

Training Department is well equipped⁵. It has machines needed by a Tool-Room and can thus impart practical training with high pedantic values.. Equipment includes conventional machines as well as CNC machines of a general engineering workshop. Typical Tool-Room machines in Training Department are mentioned below:

- CNC Wire EDM Machines
- CNC Electrode EDM Machine
- CNC Milling Machine
- CNC Lathe
- CAD/CAM hardware and software

Design

The Department is equipped with Work Stations for all design staff and conventional drawing board practice has been discontinued as a part of technology upgradation. It has design and simulation packages and is thus in a position to simulate processing parameters of tools before release of designs to production. This reduces the likelihood of carrying out design changes after trials, once the tool is made, a great advantage that the Tool Room has.

Human Resources

IGTR Indore currently employs 84 people. In addition to the General Manager who is the Chief Executive IGTR has the following personnel:

Table 10: Personnel

Designation/ Department	Deputy\ GM	Manager	Senior Engineer	Admin Officer/ Foreman	Technician	Others
Administration*				3		10
Marketing		1	2			1
Production**		2	4	4	32	5
Training	1	1	4	5	1	2
Quality Control					1	
Maintenance			1		1	2
Sub-Total	1	4	11	12	35	20
Total	83					

**Includes Design *includes Accounts and Stores #includes similar designations

As an example of a good practice followed at IGTR, it also engages technicians on contract which keeps the salary expenditure low.

⁵ List of equipment in Training Department is given in Annexure IV

Vacancies and requirement

Eighteen posts are vacant at IGTR which include important posts like 4 posts of Senior Managers who should normally head department like Production, Marketing, Design and Training. It is to keep the costs low. If higher posts are filled up and lower ones kept vacant additional costs will be incremental and advantages would possibly be off set.

Skill up gradation /capacity building need

Employees are deputed for developing training programmes but it is on the lower side. Only 13 employees were deputed for such programmes during the last 5 years. It should be done in a systematic and regular exercise as it improves knowledge and skills. It also motivates employees toward better performance.

Retention

The retention pattern is reflected in the table given below.

Table 11: Retention Pattern

Status	Total number of employees	Number of years at IGTR					Number of employees undergone technical training
		20 years and above	15 – 20 years	10 – 15 years	5 – 10 years	Less than 5	
No. of Employees	84	-	55	13	6	10	13

Out of the 84 employees, 55 have been with IGTR for more than 15 years. IGTR is thus in a position to retain employees. At the same time 27 employees have left during last 6 years. Twenty four of these were technical personnel, engineers to senior managers. Therefore, more persons who go to the industry can be leveraged to market the services. In this way, IGTR spreads technology which is also a deep drawn objective.

Incentive System

The Tool-Room has an incentive system in place for the employees. This is a group incentive scheme. It lays stress on increasing generation of surplus of income over expenditure 25 % of which is allowed to be distributed to the employees. There are restrictions on maximum amount payable, 3 month salary if a tool room has recovered cost without depreciation and 4 month salary. The payment out of the amount payable is made in proportion to the amount of basic plus dearness allowance. This is subject to the maximum limits and their attendance. The annual bonus on the lines payable to Central Government employees is not paid to employees as they have accepted the incentive scheme. This was the case in 2009-10. It puts them at a disadvantage. Employees of a tool-room with less income expenditure ratio than that of IGTR Indore were paid bonus but not the employees of IGTR Indore Also, once employees perform, here should be no limit on the maximum amount payable if it has been earned. This will be examined more in detail in separate report on all 10 Tool-Rooms.

Developing MIS to establish accountability and contribution of each individual employee and departments will improve effectiveness. It would also enable putting in place a performance linked incentive system. Initial analysis reveals that the cost and contribution of human resource significantly varies across departments e.g. training with about 17 % employees contributes 66% of revenues.

Operational Efficiency

Lead Time and Quality

Associations of industry and other users find the quality of tools made at IGTR to be good but they feel costs are high and delivery periods long. Machines, which are in use for more than 15 years must have depreciated in full. Manpower costs have gone up due to pay revisions. If 3 shift working on expensive machines is stated, over heads will be more and will have bearish effect on machine hour rates. It is time to revisit the machine hour rates based on detailed calculations rather than ad-hoc increases being presently done.

Machine Utilisation

Table 12: Capacity Utilisation of 15 Critical/High value Machines

Description	Number of hours
Installed capacity ⁶	106560
Available hours	63000
Available Load	45000
Hours utilised	29639
Rework	5102
No work	10652
Maintenance	10496
Capacity utilisation based on three 8 hours shifts, 296 working days (29639/106560)	28 %
Capacity utilisation, as above but 2 shift working (28 / 0.67)	65 %
Capacity utilisation based on three 7.5 hours shifts, 280 working days [29639/ 63000 (15 X 280 X 7.5 X 2)]	47 %
Percentage of available hours under breakdown	17 %

Machine utilisation is low. Improvement will have effect of lowering of machine hour rates as mentioned above. Breakdown time of machines is high and needs to be controlled. Preventive maintenance system at IGTR should be relooked.

Financial Analysis

Analysis has been done of the performance data for the last five financial years from the IGTR's Annual Reports made available for the following indicators:

1. Net worth
2. Profitability analysis
3. Trend of income and expenditure

Net worth

⁶ Calculation of installed capacity:

Days in a year	= 365
(Less) Sundays	=(52)
Holidays	=(17)
Net working days	=296
Number of Hours on 24x7 basis (284x24)	=7104
per machine	
Number of hours on 24X7 basis (284X24) for 15 machines	=106560

The net worth of IGTR reflects its value, considering it is composed primarily of the money that has been invested in the enterprise since its inception, as well as the retained earnings for the duration of its operation, minus what has been depreciated. Net worth of CTTC is shown in the Table 13.

Table 13: Networkth

Particulars	2005 - 06	2006 - 07	2007 - 08	2008 - 09	2009 -10
Net worth	227,173,947	235,596,046	251,707,814	271,728,583	273,177,704
Year on year increase		4%	7%	8%	1%

The net worth of IGTR, Indore has been increasing every year on an average of 5%, which is a healthy sign as it implies an increase in value of the Tool-Room. During the years the Tool-Room was also in receipt of government grants during the year.

Table 14 reflects the trend of government grants being received by IGTR, Indore:

Table 14: Government Grants

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10
Contribution from GOI	19,900,000	25,800,000	30,000,000	35,700,000	30,000,000

Net worth of the Tool-Room excluding the government grants received is provided in the table 15:

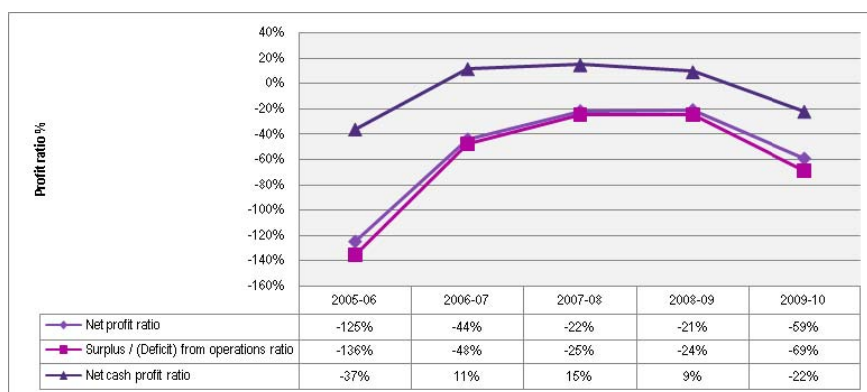
Table 15: Networkth without government grants

Particulars	2005 - 06	2006 - 07	2007 - 08	2008 - 09	2009 -10
Net worth excluding government grants	207,273,947	189,896,046	176,007,814	160,328,583	131,777,704
Year on year increase		-8%	-7%	-9%	-18%

The Net worth of the Tool-Room has been declining without government grants. The revenues are not able to recover the costs and it is evident that the Tool-Room is in need of aid from the government to sustain its operations.

Profitability analysis

Figure 9: Profitability and Composition



The Tool-Room has been incurring a deficit from operations. The same reduced over the years from FY 2005-06 at 136% to 48% in FY 2006-07, 25% in FY 2007-08, 24% in FY 2008-09. However, in FY 2009-10, the deficit has increased again to 69%.

Even after including other income, the deficit cannot be set off completely and the Tool-Room has a deficit even on an overall basis.

However, the Tool-Room generated a cash surplus in the three years FY 2006-09. The reason for the same is that depreciation is a non cash expense and accounted for a major part of the total expense. But in FY 2009-10 the Tool-Room incurred a cash deficit again due to reduction in revenue and increase in expenses. While all data for 2010-2011 was not available at the time of study, it was learnt from the management team that in 2010-2011 IGTR has generated cash surplus.

Apart from the reduction in revenue in FY 2009-10, the salary costs have increased significantly, 49% in FY 2008-09 and 26% in FY 2009-10 on account of revision in the salaries of the employees on account of recommendations from the Sixth Pay Commission, which has led to an increased burden on the profitability of the Tool-Room. With the increase in salary costs, depreciation now accounts for one fourth of the total expenses, down from one third of the expenses in FY 2005-06.

Initially the Tool-Room focussed on production and sale of goods and the same formed a major part of the total revenue, contributing around 65% to total revenue in FY 2005-06, 48% in FY 2006-07 and 51% in FY 2007-08.

However, the focus of the Tool-Room seems to have shifted from production of moulds and dies towards trainings and production of standard parts, the contribution of which to total revenue has increased from 29% in FY 2005-06 to 47% in FY 2006-07, 45% in FY 2007-08, 54% in FY 2008-09 and finally 62 % in FY 2009-10.

Income from other sources comprises of interest, scrap sales etc forms less than 10% of the total income.

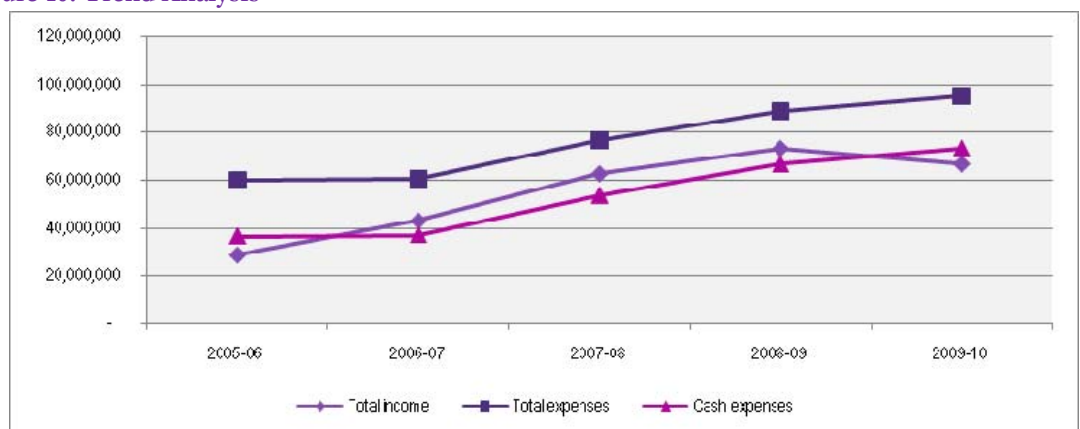
Trend of income and expenditure

Trend analysis of the income and expenditure of IGTR, Indore is based on the audited financial statements provided for the five years ended March 31, 2010. Given below is a diagram reflecting the relationship between the income, expenses and cash expenses:

Table 16: Trend of income and expenditure

Particulars	2005 - 06	2006 - 07	2007 - 08	2008 - 09	2009 -10
Total income	3,306,987	2,163,755	1,291,029	1,788,296	10,341,103
Total expenses	59,882,178	60,403,093	76,543,900	88,967,652	95,306,697
Cash expenses	36,398,555	37,046,288	53,469,433	66,606,567	73,195,865

Figure 10: Trend Analysis



- The Tool-Room's expenses have been in excess of the income and the same has led to a deficit from FY 2005-10.
- In FY 2005-06 the income was lower than the cash expenses and the Tool-Room was operating in a cash deficit scenario. But in the next three years FY 2006-09 the income increased at an average rate of 37% whereas the cash expenses increased at an average rate of 24% due to which the Tool-Room turned cash positive in each of the three years mentioned.
- However in FY 2009-10 the Tool-Room's revenues dipped by 9% whereas the total expenses increased by 7% and cash expenses increased by 10%.

Chapter IV

Overview of local Business Environment from Tool-Room perspective

This chapter assesses the location of the Tool-Room and the market potential for it to expand its services. It also analyses the availability of raw material and machinery suppliers in the region.

Location and Market Potential

The Indo-German Tool-Room, Indore is located in the industrial area on Sanwer Road in Indore in the state of Madhya Pradesh. The Tool-Room is located in the industrial hub of the state and is well connected by air, rail and road. The area around Indore houses two special economic zones Pithampur and Sanwer. Pithampur, which is about 40 km away, is often called the 'Detroit of India'. It has many automobile industries, like Cummins India, Mahle Engine Components Pvt. Ltd., Eicher Motors, Mahindra, and Caparo. Some of the largest pharmaceutical companies are also there. Sanwer, on the other hand, has steel industries. Indore shares its border with Dewas, which hosts several automobile parts manufacturing companies. The city is connected to the rest of the country by National Highways—NH-3, NH-59 and NH-59A.

The Indo German Tool-Room Indore draws a strategic advantage from its location in Indore. The city and its neighbours have significant concentration of industries which are heavy users of tools, moulds and dies. A large number of national and international reputed companies are functioning in Pithampur. Majority of the vehicle-producing companies of India have their factories in Pithampur. It is considered as a hub for the automobile manufacturing industry. Some of the major companies that have industrial units in Pithampur are New & ReCon Parts, Cummins, India, Mahle Engine Components (I) Pvt Limited, Flexituff International Limited, Anant Steel P. Ltd., L&T CASE Equipment, Eicher Motors, Mahindra 2 Wheelers, Caparo, Force Motors Ltd., Man Force Trucks, Indorama Synthetics, Steel tubes of India, Bridgestone Tyre Ltd, Kach Motors . The construction of Asia's largest auto testing track is also sanctioned by Government of India. Apart from automobile industries, Pithampur is home to various other manufacturing industries.

The Supplier Chain

Raw Material Suppliers

Local suppliers are available for materials like steel to specifications En 8, En 9, En 24, En 31, stainless steels and non ferrous metals. For other tools, steel is sourced in Mumbai, Chennai etc as even the local suppliers depend on them.

Machinery Suppliers

Machinery suppliers both conventional and precisions machine have liaison agents/representatives based in Indore which offers an advantage in servicing and attending to break downs. They can help in getting

the service engineers who are generally based in headquarters or regional offices in Mumbai, Chennai, and Bangalore.

Summary of Backward Linkages

Table 17: Backward Linkages

Input	Linkage/ Sources
Raw Materials	Limited stockists in Indore. Stockists, importers and agents of alloy tool steel are located in in Mumbai and Chennai.
Machine Tools	Indigenous machines are purchased directly from manufacturers. Direct imports of imported machines. Nearly all such suppliers have agents in India for liaison and service back up. Some imported machines are also available in rupee payment in India from agents
Standard Moulds and Die sets	Manufacturers or stockists, mostly in Mumbai, Chennai and Bangalore. Some complex parts like hot tubes for hot runner moulds are imported.
Cutting Tools	Manufacturers and stockists sufficiently present in Indore
Consumables like oils, greases, salts	Stockists in Indore
Spares	From OEMs except for standard spares like bearings
Specialised servicing of CNC Machines	By the machinery suppliers. In case of imported machines this is provided by agents of the foreign suppliers through annual Maintenance Contracts which tend to be expensive or on visit basis. IGTR prefers visit basis. Service agents are based at the headquarters of the agent and arranged on need basis.

Growth and Presence of Private commercial Tool-Rooms:

According to Association of Industries, Madhya Pradesh, there are a few private commercial tool-rooms in the state. They are operating at a low scale and making simple tools. According to them these commercial tool-rooms can upgrade their operations if IGTR does the 'hand holding' and assist them in design and with common facilities in machining of complex parts as they do not possess high end tool-room equipment which IGTR has got. Also Government Tool-Rooms cannot meet the gap between demand and supply of tools. Private commercial tool making must be encouraged and IGTR should act as a catalyst in Indore and assist commercial Tool-Rooms in and around Indore to expand their operations. Support in the following areas is needed:

- Design and development of products and tools
- Developments of prototypes
- Making tool parts for which commercial Tool-Rooms do not have the facilities
- Assistance in programming of CNC machines to the extent available with these Tool-Rooms
- Assistance in selection of new equipment

IGTR needs to concentrate on hand holding with private commercial tool-rooms. To gear up for this, as mentioned above, it should increase its utilisation and review the machine hour rates. Reasonable rates and timely deliveries will go a long way in this endeavour.

Chapter V

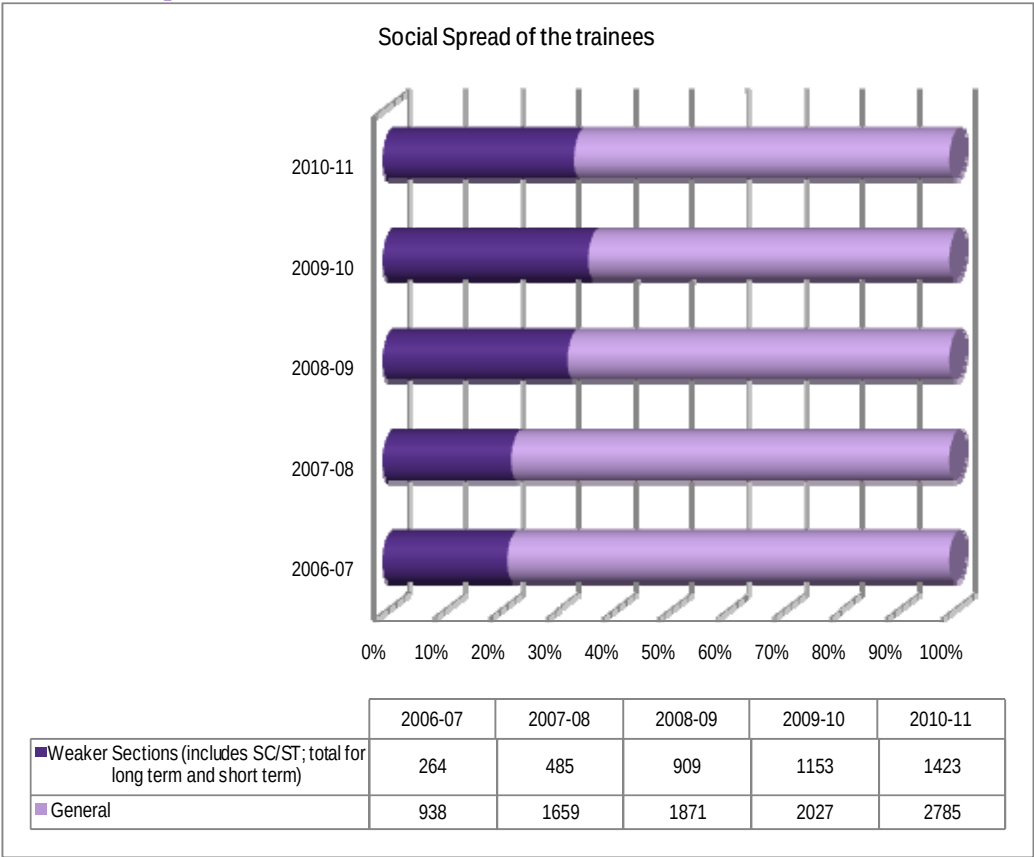
Inclusive Growth underlined by Social Impact

The IGTR has made maximum impact in area of training compared to other services. It has trained 4208 persons in 2010-11 under various training programmes resulting in employment creation. Target for next year is 4100.

Social Spread of Trainees

The IGTR has had a balanced spread in terms of training to General category students and weaker sections.

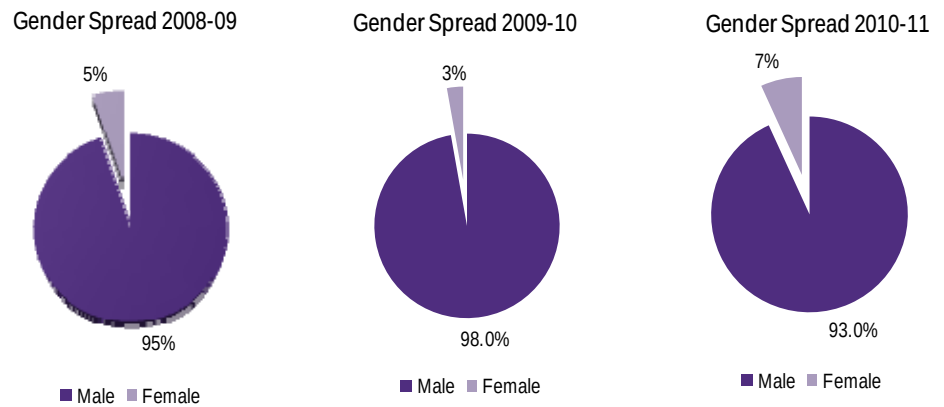
Figure 11: Social Spread of the trainees



Gender Spread

Given below is the gender spread in the Tool-Room for its long and short term courses for the last three years. Representation of women in training programmes is skewed. No special incentive is provided to encourage women to participate in the trainings. Pattern for the last three years is reflected in the Figure below.

Figure 12: Gender Spread



The impact of IGTR in terms of development of MSMEs and human resource for the industry is rather limited and scaling up has not been undertaken. The number of trainees is marginal in comparison to industry demand. For instance, auto component industry needs additional manpower of more than 35 million over next 10 years.

SWOT

Strengths

- is the most well equipped commercial tool room in the Region
- It is set up with development objectives and offers its services without commercial objectives
- It has developed expertise in design and development of Form Filled Seal Moulds for Pharmaceutical Industry
- It has earned great reputation for its training programmes
- It has a good training expertise
- It does not depend on Government grants for recurring expenditure.

Weaknesses

- Low level of utilization of installed capacity
- High response time and procedural delays
- High price level
- There is limited use of pricing techniques and other financial management tools
- Limited understanding of the local market and MSME needs

Opportunities

- Industry is aware that IGTR is an institute of excellence in training for industry
- Significant scope for scaling up training and tooling services given the favourable market conditions
- Abundant demand for tooling. In 2010-11 national demand was Rs.13225 crores and it is growing at CAGR of 13% (Source: TAGMA)
- Location in a growing industrial area
- Huge requirement of trained manpower in the country
- Government support for capital investment is available

Threats

- Mandate for monitoring based on indicators of self sustainability drives the Tool Room towards revenue generation through high paying jobbing services that often limits the policy objective of increasing competencies of MSMEs
- Easy procedures and low customs duties for import of tools. TAGMA's latest survey indicates that more than 30 % tooling is imported in the country.
- Low price levels and faster deliveries of tools from some countries, especially China and Taiwan.
- MSMEs prefer low costs of tools compared to high cost tooling services provided by IGTR

Conclusion

IGTR has made significant impact in the past in creating skilled manpower, producing precision tooling and disseminating new technologies. Over the years, the trend has changed and there is dilution of effort in supporting MSMEs. However, sustaining and scaling up the impact is imperative. It would be major challenge given constraints like, diluting linkages with local MSME market, limited networking skills, low level of use of modern financial and management systems, etc.

The policy direction and monitoring indicators mainly give weight age to self sustainability which needs to be revisited as the impact on MSMEs and job creation is of equal significance. Over emphasis on cost recovery and related financial indicators has resulted in reduced impact on the MSMEs. It is also necessary that the IGTR develops an understanding of the current and emerging MSME needs (especially local clusters) on both training and tooling fronts. A formal survey of the MSME market relevant to the IGTR is needed for this purpose. This would be essential to establish short and long term targets with an eye on the impact.

Annexure I

Details of Visits

Details of visit of GT Team to IGTR Indore

Date of visit	Name of the City	Details of Meetings	Person Met	Designation
19 July 2011	Indore	MSME – Indo-German Tool Room	Shri M.M Sharma	General Manager
19 July 2011	Indore	MSME – Indo-German Tool Room	Shri P.K. Sharma	Deputy General Manager
19 July 2011	Indore	MSME – Indo-German Tool Room	Shri Ashok Kumar	Manager
19 July 2011	Indore	MSME – Indo-German Tool Room	Shri C.S. Sharma	Manager
19 July 2011	Indore	Regal sales Corporation	Shri Sanjay Jain	Proprietor
20 July 2011	Indore	SECO (Shubham Marketing)	Shri S K Jhalawad	Sales Representative
20 July 2011	Indore	Association of Industries Madhya Pradesh	Shri Ashok Jaiswal	President
20 July 2011	Indore	Shree Aadhaswami Steel Industry	Shri Subhash Sachdev	Sr. Vice President
20 July 2011	Pithampur	Shree Pacetronix Ltd	Shri Mayar Bhurai	Engineer
20 July 2011	Pithampur	Panasonic Energy India Co. Ltd.	Shri P.D.Joshi	Deputy General Manager
20 July 2011	Pithampur	Panasonic Energy India Co. Ltd.	Shri R.V. Mahajan	Assistant Engineer

Annexure II

Production Equipment

Equipment in Production (15 high value machines)				
Ref No.	Type	Make/Model	Max Job Wt/Length	Axes
TR-05	CNC TUR FAMOT CTX400 Series2	DMG	Dia 570 x 635	
PM-01	CNC MILL.WF 52-D	MIKRON	300KG./1200 X600	3
PM-02	JIG BOR.B3 DR	HOUSER	300 KG/600X380	3
PM-03	CNC MILL.DMC 70V	DECKEL MAHO	800KG	3
PM-04	CNC MILL.DMC 100V	DECKEL MAHO	1200 KG/1250X800	3
PM-05	CNC MILL.DMC 70V hi-dyn	DECKEL MAHO	800 KG/900X550	3
PM-06	CNC MILL.KMC2000SDA	KAO-MING	6000KG/2000X1250	3
ED-01	CNC EDM ROBOFORM-20	CHARMILLES	200 KG/397X300	3
ED-02	EMS 5535/R50	ELEIGTRA	300KG/550X350	3
ED-03	CNC EDM ROBOFORM-50	CHARMILLES	1600KG /750X500	3
ED-05	CNC W/C FROBOFIL 310	CHARMILLES	500/850X500	2
ED-06	CNC W/C ROBOFIL 300	CHARMILLES	500KG/850X500	2
ED-07	CNC W/C CW850HS	CHAMER	1200X800X400	2
PM-07	CNC MILL.DCM 1422	TAKANG	6000kg/2200 x1600x900	3
SG-05	PREC. SUR GRD. JF 520-1	JUNG	600X200	3

Annexure III

Training Equipment

Machine Description Make/Model	Specifications	Nos.
LATHE		
1 LATHE KIRLOSKAR/E 380	Max. Dia of Job – 380 mm Max. Job Length Between Centres – 1000 mm	05
2 LATHE KIRLOSKAR/E 1550	Max. Dia of Job – 310 mm Max. Job Length Between Centres – 1000 mm	03
3 LATHE KIRLOSKAR 355	Max. Dia of Job – 380 mm Max. Job Length Between Centres – 1000 mm	03
4 LATHE PANTHER 1350/2	Max. Dia of Job – 205 mm Max. Job Length Between Centres – 1000 mm	04
5 LATHE – DMTG	Max. Dia of Job – 360 mm Max. Job Length Between Centres – 1000 mm	07
TOTAL		22
MILLING		
1 MILLING MACHINE BFW . VF2(WITH DRO)	Table size – 1350 x 315 mm Movement (X x Y x Z) – 830 x 260 x 420 mm	05
2 MILLING MACHINE HMT/FNIU	Table size – 900 x 230 mm, Max. Job Wt. – 150kg. Movement (X x Y x Z) – 560 x 250 x 400 mm	02
3 MILLING MACHINE	Table size – 1000 x 230 mm	04

	BFW . VFI(WITH DRO)	Movement (X x Y x Z) – 590 x 270 x 390 mm	
4	MILL NAMMILL UNIVERSAL	Table size – 1320 x 320 mm Movement (X x Y x Z) – 800 x 300 x 410 mm	08
5	MILLING MACHINE HMT/MITR	Table size – 1070 x 230 mm, Max. Job Wt. – 250kg. Movement (X x Y x Z) – 760 x 305 x 400 mm	01
6	MILL NAMMILL UNIVERSAL/XL6026AU	Table size – 1320 x 320 mm Movement (X x Y x Z) – 800 x 300 x 410 mm	04
7	SHAPPER (SAGAR ENGINEERING)	24” stroke	01
	TOTAL		25
	GRINDING		
1	SURFACE GRINIDER ELB – OPTIMAL	Grinding Area – 500 x 375 mm Movement – 550 x 375 x 250 mm	01
2	SURFACE GRINIDER KIRLOSKAR	Grinding Area – 700 x 350 mm Movement (X x Y x Z) – 750 x 350 x 300 mm	01
3	SURFACE GRINIDER TYPE GSH 10030 PARMAR	Grinding Area – 1000 x 300 mm	01
4	SURFACE GRINIDER KIRLOSKAR	Grinding Area 250 x 500	02
5	SURFACE GRINDER MAKE PROYOSHA MODLE NO P1H1230 SUPRIME	Table size – 250 x 750 mm,	01
6	CYLINDRICAL GRINDER HMT/K1304	Max. Dia of Job – 250 mm Max. Job Length Between Centres – 800 mm	02
7	UNIVERSAL CYLINDRICAL GRINDER PARISHUDH GCI 200 S	Max. Dia of Job – 200 mm Max. Job Length Between Centres – 400 mm	01
8	CYLINDRICAL GRINDER DEVCO/UC-500	Grinding Area Dia 250 x 500	01
9	VERTICLE CUP WHEEL GRINDER SOLID	Table size – 350 x 200 mm,	02
10	TOOL & CUTTER GRINDER HMT/T28C	Max. Dia of Job – 280 mm Max. Job Length Between Centres – 760 mm	02
	TOTAL		14

Annexure IV

Training Courses

Course	Duration
Long Term	
Advance Diploma in Tool & Die Making	4 Years
Certificate Course in Machinist Trade	2 Years
Advance Certificate Course in Machinist Trade	2 Years
Certificate Course in Automobile assembly & Service	2 Years
Post Diploma in Tool Design	1 Year
Condensed Course in Tool & Die Making	1 Year
Certificate Course in Conventional Machining	1 Year
Certificate Courses in CNC Turning & Milling	1 Year

Short Term	Duration
Post Diploma in CAD / CAM	6 Months
Certificate Course in CNC Machining	6 Months
Advanced Certificate Course in CAD/CAM	3 Months
Basic Course in CAD / CAM	3 Months
Advance Course in CAD / CAM	3 Months
Master CAM	3 Weeks
Solid Works	3 Weeks
Pro E	3 Weeks
Unigraphics	3 Weeks
Catia	3 Weeks
CNC Turning Programming & Operation	2 Weeks
CNC Milling Programming & Operation	2 Weeks
Auto CAD	2 Weeks
Inventor	3 week
Heat Treatment of Steels	1 Week

Basic Course on Pneumatics	1 Week
Basic Course on EleIGTRo Pneumatics	1 Week
Basic Course in Hydraulics	1 Week
Basic Course on EleIGTRo Hydraulics	1 Week
Solid Edge	3 Week
MSC Nastran Basic	2 Week
MSC Nastran Advance	2Week
Del CAM	2week



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Strategic Assessment of MSME Tool Rooms

As Is Assessment Report – CIHT Jalandhar

Prepared for

**Micro, Small and Medium Enterprises
Umbrella Programme**



Knowledge Partner:



Grant Thornton

Contents

	Page
Abbreviations Used	5
Executive Summary	7
Introduction	9
Introduction	9
Chapter I- Organisational Profile	11
Chapter II- Governance and Management Systems	13
Chapter III- Organisational Assessment	17
Chapter IV- Overview of Local Business Environment from Tool-Room Perspective	31
Chapter V- Inclusive Growth underlined by Social Impact	33
SWOT	35
Conclusion	36
Annexure I- Details of visits	37
Annexure II- Training Courses	38
Annexure III- Production Equipment	42
Annexure IV- Training Equipment	45
Annexure V- List of Training Programmes recently attended	47

Table 1: CIHT Profile.....	11
Table 2: Annual targets	14
Table 3: Service Mix of CIHT Jalandhar	17
Table 4: Service - Sector mix of CIHT Jalandhar.....	18
Table 5: Sources of revenue.....	18
Table 6: Sector mix of revenue from production of services (Average of 2006-07 to 2010-11).....	18
Table 7: Training income from various courses	20
Table 8: Industry break-up CIHT Jalandhar	23
Table 9: Facility break up of CIHT Jalandhar.....	24
Table 10: Power back-up.....	25
Table 11: Personnel.....	26
Table 12: Retention Pattern	27
Table 13: Machine utilisation.....	28
Table 14: Net worth trend over 5 years	28
Table 15: Government Grants	28
Table 16: Net worth without Government grants	29
Table 17: Trend of income and expenditure.....	30
Table 18: Backward linkages.....	32

Figure 1: Organisation Chart	12
Figure 2: Share of services.....	19
Figure 3: Number of persons trained.....	19
Figure 4: Training income from various courses.....	20
Figure 5: Spread of income: tooling services	23
Figure 6: Repeat order 2010-11	23
Figure 7: Geographic spread of the production services supplied	24
Figure 8: Break-up of infrastructure.....	25
Figure 9: Profitability and composition	29
Figure 10: Trend analysis.....	30
Figure 11: Social spread of trainees	34
Figure 12: Gender Spread	34

Abbreviations Used

AICTE	All India Council of Technical Education
CAGR	Compound Annual Growth Rate
CAD	Computer Aided Design
CIHT	Central Institute of Hand Tools
CNC	Computer Numerical Control
CAM	Computer Aided Manufacturing
D	Dimensional
DC	Development Commissioner
DG	Diesel Generating
EDM	Electrical Discharge Machining
ESPD	Entrepreneurship & Skill Development Programme
FMIS	Financial & Management Information System
FY	Financial Year
GFR	General Financial Regulations
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GOI	Government of India
HOD	Head of Department
HRD	Human Resource Development
HT	Heat Treatment
ISO	International Standards Organisation
IT	Information Technology
ITI	Industrial Training Institute
IMTEX	India Metal-cutting Machine Tool Exhibition
IITF	India International Trade Fair
L 1	First Lowest
M/C	Machine
MIS	Management Information System
MoMSME	Ministry of Micro, Small and Medium Enterprises
MSME	Micro, Small and Medium Enterprises
NTTF	Nettur Technical Training Foundation
OEM	Original Equipment Manufacturers
PG	Post Graduate
SOP	Standard Operating Procedure
UNDP	United Nations Development Programme

Executive Summary

Tool-Room is the backbone of the manufacturing industry. To assist MSMEs with infrastructure in tool engineering, the Government set up Central Institute of Hand Tools at Jalandhar, under UNDP, for design and manufacture of tools and components for hand tools industry and training of manpower in employable skills for it. It has been operating as a Government of India Society under Chairmanship of DC MSME since 1983. During the collaboration period, total investment in the project was Rs.4.08 crore of which Government of India, UNDP and Government of Punjab contributed Rs.2.10 crore, and Rs.1.16 crore and Rs.0.82 crore, respectively. State-of-the-art tool production facility is installed at CIHT which includes high-end machines like CNC milling and turning machines, CNC wire cut machine for manufacture of tools. It has metallurgical equipment like vacuum emission spectrometer and induction heater, drop hammers and forging press for forging of the hand tool industry.

CIHT has not been able to recover its expenses (with or without depreciation). Its income-expenditure gap has, however, marginally reduced from Rs.116.60 lakhs in 2005-06 to Rs.93.42 lakhs in 2010-11. It will take time and inputs in the form of training to develop expertise in design and manufacture of moulds for plastics and press tools for sheet metal components to achieve financial sustainability. In year 2010 -11, its income was Rs.298.78 crore and expenditure was Rs.392.20 crore. Operating income and expenditure (without depreciation) in recent years was as below:

Rs. in lakhs					
Year	2006-07	2007-08	2008-09	2009-10	2010-11
Income	124.06	177.75	197.01	247.16	298.78
Recurring Expenditure	240.65	265.32	336.42	404.74	392.2
Income minus expenditure	(116.60)	(87.56)	(139.40)	(157.58)	(93.42)

There is no incentive scheme as CIHT has not yet reached the level from which incentive schemes approved by DC MSME for all Tool-Rooms becomes applicable. Good HR policy is in vogue. Communication channels are maintained at all levels of employees. They are deputed for skill development for current range of tooling and production services. An elaborate and organised programme is needed to develop expertise in design and manufacture of moulds for plastics and press tools for sheet metal. There is a substantial local market for such tools. CIHT has the required equipment to cater to the demand.

Machine utilisation is 28% of capacity, based on three shifts, as is the industry norm for expensive and high-value equipment that it must be used round the clock. If capacity is calculated on the basis of two shifts prevalent at the Tool-Room, utilisation is 42%.

Training is doing better than the production division, contributing 60% of revenue from training and production put together. CIHT provides assistance to MSMEs. In terms of numbers, share of MSMEs was 98.92% in 2010-11 and in terms of value it is 99%. CIHT trained 2175 personnel in its training programmes in the same year.

It has developed expertise in forging dies, forgings for hand tool components, pipe fitting etc.

Some of the key challenges, constraints and solutions are tabulated below:

<u>Function/ process</u>	<u>Challenge/constraint</u>	<u>Key solution</u>
Tooling Production	CIHT's current share of tool production is 25% of the total production related services.	Organise elaborate training in design and manufacture of plastic moulds and press tools for sheet metal components.
Management Systems	Data on estimates of costs quoted and actual costs is not analysed for future corrective action in case of cost overruns. Long-term trainees have started completing the course, started four years back. Post placement tracking system is yet to be designed.	Design of IT enabled Financial and Management Information System (FMIS) is needed for continual improvement and accountability which can be linked to a suitable reward/incentive system. It will also assist in post placement tracking.
Networking with other Tool- Rooms and alumni	There is no networking with other Tool-Rooms except yearly meeting of General Managers / Principal Directors. .	Networking with other Tool-Rooms under DC MSME for knowledge and capacity sharing should be more frequent and extended to HOD levels.
Lack of marketing strategy for tooling services	CIHT does not have a marketing strategy for its tooling division based on market assessment, study or survey of market needs and market segmentation	It should have a strategy-based on market need assessment and segmentation. Market study needs to be carried out

Introduction

Background information

Tool-Room is the backbone of the industry as manufacturing excellence begins with tools, dies and moulds. To foster the growth of Micro, Small and Medium scale industries, Government of India set up ten Tool-Rooms across the country with state-of-the-art equipment for design and manufacture of tools and for training of manpower in employable skills. Of these, four were set up with the assistance of Government of Germany, three with the assistance of Government of Denmark, two under UNDP and one without any external assistance. These Tool-Rooms are set up as autonomous Government of India societies, with DC MSME as the Chairman. Central Institute of Hand Tools at Jalandhar is one of the two Tool- Rooms set up under UNDP assistance.

The Tool-Rooms have now been operating for about 10 years after close of the agreements of external assistance. Deutsche Gesellschaft für Internationale Zusammenarbeit is supporting an evaluation study of 10 Tool- Rooms. M/s Grant Thornton Advisory Private Limited has been retained as Consultants to carry out the Study. Tool-rooms under the state governments are outside the scope of this Study.

Terms of reference

The consultant team has been tasked to analyse the existing strengths and weaknesses of the ten Tool-Rooms in terms of their management, finances, human resources, technology and infrastructure, as part of the assessment of Tool-Rooms that includes the following:

- institutional/ organisational development study of the scheme consisting of political economy aspects, involving actors, financial flows, management systems and inter-agency issues (to be executed in form of a user feedback survey)
- stakeholder feedback on existing Tool-Room services from MSMEs and relevant business associations (to be executed in form of a user feedback survey)
- stakeholder feedback on further requirements from Tool-Rooms by MSMEs and relevant business associations
- training needs of Tool- Room personnel
- comparison of services with similar private sector and German facilities
- best practices from comparable national institutions such as the Nettur Technical Training Foundation (NTTF), Bengaluru [NTTF is a private educational trust established with Swiss assistance.]

Methodology

Data has been collected through secondary research publicly available information on MSME Tool-Rooms and through a structured questionnaire filled by the respective Tool-Rooms. Facility of the Tool-Room was visited and a series of meetings and discussions took place with senior and middle

management of the Tool-Room, local associations, suppliers, users and non-users MSMEs, large number of clients and state government agencies for qualitative assessment.¹

Based on the quantitative information and qualitative assessment, functioning of each Tool-Room has been assessed and analysed to provide actionable recommendations. For improving alignment of Tool-Room services to the strategic goals of the Government in setting them up. This is done through an optimum mix of different services and delivery approach, increased revenue, outreach and impact; improved organisational procedures and governance mechanisms, technological and human resource development, enhanced networking etc. Recommendations shall be accompanied by a time-bound and cost estimated action plan for the DC-MSME for implementation. Cost estimates would refer to requirements of additional machinery or equipment, general infrastructure, staff restructuring and training etc that would be needed to implement the recommendations. In addition, an institutional analysis framework that can be used by DC-MSME in future will also be developed.

This report is limited to ‘AS IS’ assessment and analysis of functioning of Tool-Room and recommendations are part of a separate report.

Structure of the report

Given below is a summary of how the report has been structured:

Chapter I – Organisation Profile: A brief description of CIHT Jalandhar

Chapter II – Governance and Management Systems: This chapter assesses the autonomy of the Tool-Room and its Chief Executive, the General Manager, guidelines defined by the Ministry of MSME and the level of its interaction with DC MSME.

Chapter III – Organisational Assessment: This chapter assesses the current status of service portfolio, technological infrastructure, marketing strategy, finance, management systems, human resource and its impacts against the stated policy goals.

Chapter IV – Overview of Local Business Environment from Tool-Room perspective: This chapter assesses the location of the Tool-Room and the market potential for it to expand its services. It also analyses the availability of raw material and machinery suppliers in the region.

Chapter V – Inclusive growth underlined by Social Impact: This chapter analyses the impact made by CIHT in all the three areas of training, tooling and dissemination of environment-friendly technologies to MSMEs.

¹ Complete list of meetings and interview is placed at Annexure I.

Chapter I

Organisational Profile

CIHT Jalandhar

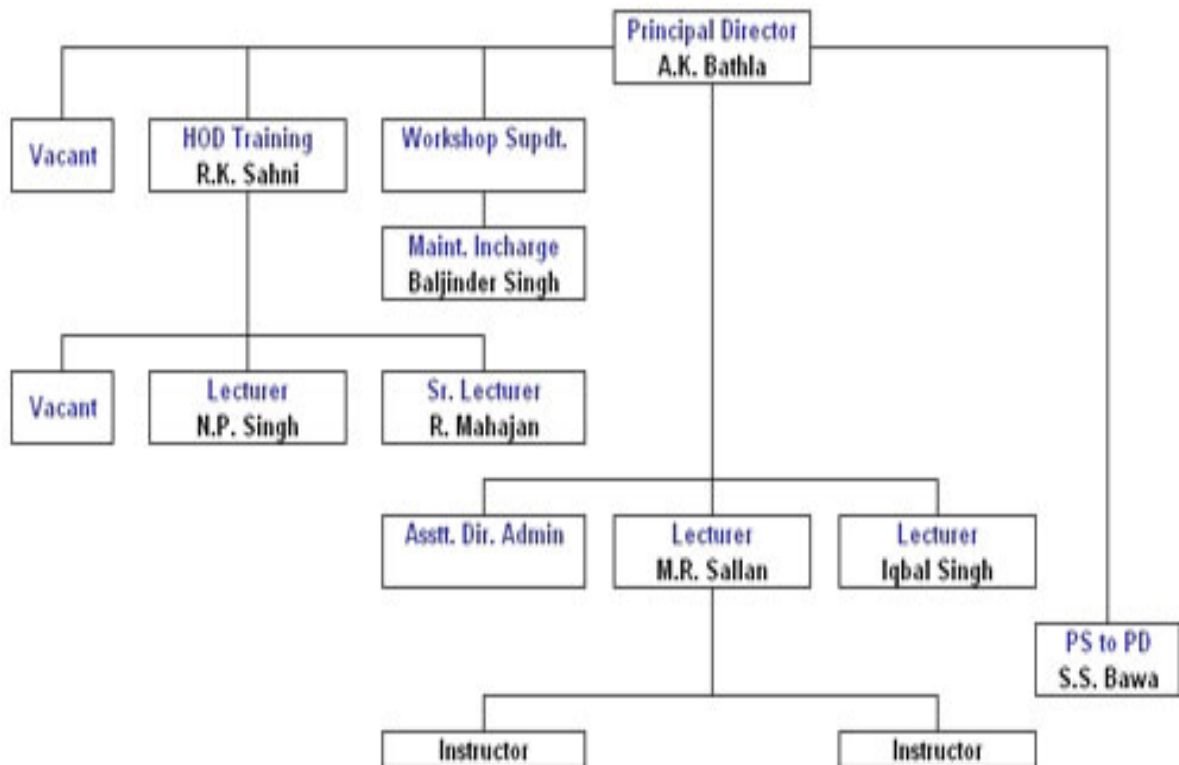
Table 1: CIHT Profile

Table 1: CIHT Profile

1.	Project Background	Central Institute of Hand Tools (CIHT), Jalandhar was established for the development of Hand Tool Industry in the country. It had been set up as a National Institute as an autonomous organisation with the assistance of UNIDO in 1983.								
2.	External Aid Agency	United Nations Development Programme								
3.	Project Cost	Rs.4.08 crores (up to period of collaboration with UNDP)								
4.	Funding Pattern (figures in Rupee Crores)	<table><tr><td>GoI</td><td>GoP</td><td>UNDP</td><td>Total</td></tr><tr><td>2.10</td><td>0.82</td><td>1.16</td><td>4.08</td></tr></table>	GoI	GoP	UNDP	Total	2.10	0.82	1.16	4.08
GoI	GoP	UNDP	Total							
2.10	0.82	1.16	4.08							
5.	Organisational Structure	Government of India Society – an autonomous body under MoMSME, DC MSME								
6.	Objectives	- to develop new designs of hand tools, not manufactured by the industries, and prototypes of the same - to design and manufacture forging dies and other tools - to provide common facility services for forging of components for hand tools - to provide consultancy services leading to setting up of turnkey projects - to assist small and medium scale industries in the design and development, manufacture of dies, heat treatment of tooling for hand tool - to train personnel for the industry to adopt improved technology in product design, production technologies, testing and quality control techniques, packing and product development								
7.	Technology	Following facilities/technologies are available at CIHT for tooling, production, training and rapid prototyping: - the production facilities like CNC controlled milling machines, CNC wire cut machine, CNC turning centre, grinding machines - the Tool-Room also has heat treatment facilities like induction heaters, gas carburising furnace								

		• forging facilities which include belt drop hammers and forging press • inspection facilities like height gauge , hardness tester, CMM • the testing lab equipped with instruments such as the spectrometer and metallurgical microscope
8.	Training Programmes	• Long-term courses Diploma in Mechanical Engineering (Tools and Die). The duration of the course is 4 years. • Short-term courses The institute offers 33 courses. The duration of these courses vary between 2 weeks to 6 months. Some of the courses offered are for orientation and specialisation in the CNC technology, welding, marketing management, entrepreneurship development and CAD/ CAM among others.

Figure 1: Organisation Chart



Chapter II

Governance and Management Systems

This chapter assesses the autonomy given to the local management, procedures followed by the Tool-Room defined by the Ministry of MSME and the level of interaction between DC MSME and the Tool-Room. This also assesses the role of GC in the overall functioning of the Tool-Room. This is to analyse how all these factors are contributing or hindering the performance of CIHT Jalandhar.

Policy goals and direction

When established, CIHT was a Tool-Room with a limited scale to make forging dies, other simple tooling and heat treatment for hand tool industry as mentioned in its Memorandum of Association. Other tooling activity was envisaged later and added piece meal without any study of the market and its segments for CIHT. Some CNC Tool-Room machines were added. No organised soft inputs were, however, made to develop expertise on it, like posting of foreign experts in other Tool-Rooms, or in other Tool-Rooms under DC MSME, to train employees in the design and manufacture of such complex tooling. Tool making needs engineering skills of a high order. This needs to be addressed if CIHT has to make tools for the plastic and sheet metal industry. Foreign experts are not necessarily needed. It can be organised in the country in other Tool-Rooms. Another activity on production front was, common facilities for forgings needed by hand tools industry.

Requirement of tools from hand tool industry includes simple tools, like forging dies for drop hammers which even simple workshops can handle; making CIHT face stiff price level competition for such tools. If CIHT has to manufacture complex tools, an organised study is needed to identify the needs for development of skills and avenues to do so, timeframe and the budget for such inputs for outputs envisaged.

CIHT also, like other Tool-Rooms, has mandate of full cost recovery. Its Management Team is making efforts in that direction. It faces more challenges than others for reasons mentioned above. In addition to financial recovery, targets are also fixed for number of trainees. While number of MSMEs and other units assisted are reported, no targets are fixed for value of such assistance. This monitoring should also include the value of services, including consultancy to MSMEs, improvement in quality and productivity as a result of “technology-related assistance” and the social impact.

CIHT does not, yet, qualify for incentive payment to employees in terms of the guidelines issued by DC MSME.

Core management team

Core management team is well knit and is striving hard to fulfil the mandate of cost recovery. However, it has its limitations due to lack of expertise in design and manufacture of medium to high-end mould and press tools. During last five years it has not been able to make cost recovery, even without depreciation.

Annual targets

There is no formal need assessment undertaken to estimate the market opportunity for CIHT services and fix targets based on it. Annual targets are fixed for training and production which are not linked to the market opportunity or the desired level of impact. The targets are both financial and physical. However; there are no targets with respect to the value of assistance to MSMEs. The table below provides details of targets achieved by the CIHT in the year 2010-11:

Table 2: Annual targets

Service	Target	Achievement	Achievement %
Long Term Courses	145 persons	125 persons	86%
Short Term Courses	1855 persons	2050 persons	111%
Total of long & short-term	2000 persons	2175 persons	109%
Training (Revenue)	Rs.186.00 lakhs	Rs.167.88 lakhs	90%
Production (Revenue)	Rs.200.00 lakhs	Rs 113.60 lakhs	57%

Source: Performance Summary submitted by CIHT

Management system

The CIHT is an ISO certified institute. However, certification is not renewed for the last 3 years due to non-audit which is necessary for renewal. Management is thinking of getting the certification afresh.

There are SOPs on the following subjects:

- estimation sheet for quoting the prices for tooling
- quality assurance
- inspection report for the raw materials purchased
- product release note and deviation note
- rejection report
- customer satisfaction
- design of training programmes
- evaluation of training programmes

Design of IT enabled Financial and Management Information System (FMIS) is needed. Improvement and accountability can be enhanced through the use of FMIS which can be linked to a suitable reward/ incentive system.

Procurement system

Raw materials for forging dies for hand tools are supplied by customers for machining operations at CIHT. However, for other materials, it needs to follow the procurement guidelines laid down in the General Financial Rules (GFR) calling for quotations and decision making guided by L 1 principle due to which suppliers tend to quote lower rates, sometimes compromising on quality. Being a public institute, CIHT has to follow the financial regulations. Procedures will have to be simplified when tooling activity increases. Rate contracts are a possibility when tooling activity is upgraded.

For capital goods, an action plan with details of equipments and related costs is prepared in consultation with local GC members and submitted to DC-MSME at the beginning of FY in consultation with Integrated Finance Wing of the MoMSME. It is then ratified by the Governing Council. However, there are instances, when request for funds is submitted, the Integrated Finance Wing sometime raises objection at that stage despite it being concurred in by them before. Procedure needs to be simplified and Integrated Finance Wing, having agreed before, should not

object at the advanced stage. Since the capital goods are also procured on least-cost basis, two bid systems should be used. It may be advisable to seek performance bank guarantee from the supplier for a limited period to ensure desired performance of plant and machinery.

Development of a procurement manual covering the operational details on above suggestions would be beneficial to improve efficiency and effectiveness of procurement.

Networking with other Tool-Rooms, Institutions and Alumni

CIHT networks with industrial training institutes, polytechnics and engineering colleges for knowledge and capacity sharing and conducting training programmes for their students. During 2010-11, thirty one such institutes were visited. There was a good response. Such interaction helps CIHT to market its short-term training programmes.

Long-term training course in tool and die making started only four years ago with an intake of 20 trainees. First batch of 17 trainees has passed out recently. CIHT management has to evolve a system to track the trainees after placement in order to help generate more business. The training initiative can be scaled up through networking with institutions having infrastructure available with them e.g., ITIs, polytechnics, State Government Tool-Rooms/ institutions, etc. Networking with other tool rooms under MoMSME would also be useful for knowledge and capacity sharing. Again IT enabled platform for such networking is essential.

Interaction with DC MSME

DC MSME monitors the performance of the Tool-Room. System is in place under which Tool-Room submits the following reports:

- Performance report is submitted monthly. Against annual targets, the following information is submitted for the month and cumulative during the year, up to the month of reporting: Revenue, expenditure, order position, delivery status, machine utilisation, number of trainees and number of MSMEs assisted. Tool-Room is required to explain the short falls, if any.
System brings out cost recoveries but not the impact and outreach to MSMEs. Instead of monitoring numbers it should bring out the value of assistance provided to MSMEs and highlights of five technology-related assistance cases. System needs to be evolved to monitor customer and trainee feedbacks of courses conducted.
- Annual action plan containing targets and funds needed during the year for recurring and non-recurring expenditures. It is prepared in consultation with local members and submitted to DC MSME who approves the same in consultation with Integrated Finance Wing of the Ministry. It is then put to Governing Council for ratification. Role of the Governing Council is limited to local members.
- Monthly status of court cases in which DC MSME is respondent.
- Annual Report which includes audited annual accounts for placement before the Parliament.
- Information on innovative work done. This is used for preparation of Cabinet Note on the performance of MoMSME.
- Annual manpower status.

Decision making

Management of the Tool-Room is with the Governing Council. However, it meets once in a year on an average, when convened to pass Annual Accounts and Annual Report. It also coincides with Annual General Meeting. These meetings are generally held away from the Tool-Room premises. Also, representatives of industry are not found to be taking interest in decision making and it is generally the officials from MoMSME and the State Government who deliberate in the meetings. Members other than officials are volunteers. It is suggested that the structure is revised in favour of greater percentage of independent members with no personal or professional relation with the Tool-Room e.g., representatives from universities and technology leaders, for greater effectiveness of GC, who should be paid honorarium for their services.

Chapter III

Organisational Assessment

This chapter assesses the current status of service portfolio, technological infrastructure, marketing strategy, finance, management systems, human resource and its impact against the stated policy goals. This chapter also analyses different factors which are either contributing to and/or hindering the performance in achieving the stated objective and policy goals of enhancing competitiveness of manufacturing MSMEs through tooling services and availability of skilled manpower.

Overview of services

CIHT Jalandhar is currently offering “Tooling, Job Works and Training services” which are in-line with its overall stated objectives. The following services are currently being offered by the CIHT:

Table 3: Service Mix of CIHT Jalandhar

Production		
Tooling	Job work	Training ²
- Design of forging dies, trimming dies, blanking dies, gauges, simple moulds & press tools, jigs & fixtures etc. - Manufactures forging dies, trimming dies, blanking dies, gauges, simple moulds & press tools, jigs & fixtures etc. - Production of forgings for hand tool parts - Trial of tools	- Heat treatment of blanking dies, trimming dies, hand tools, gears for automobiles - Forge shop is providing common facility services by way of forging tools, pipe fittings, auto part and other engineering products. - Testing and quality control of materials i.e. chemical composition, physical properties, inspection of various screw gauges and measuring instruments. - Production of forgings for hand tool parts.	Long-term courses (One year or more duration) - Four-Year Diploma Course in Mechanical Engineering (Tool & Die) with an intake capacity of 40 Short-term courses (Less than one year) - CIHT conducts a large number of short-term training courses based on CAD/ CAM, electronics, mechanical, logic controller etc. - Duration of short-term courses varies from 60 hrs to 6 months
In addition to the above CIHT also provides Consultancy in design and development department.		

² List of short term and specialised courses conducted by CIHT is Annexure II

The service – sector matrix below indicates the services utilisation by respective sectors

Table 4: Service - Sector mix of CIHT Jalandhar

Type of Tools/ services	Industry Cluster					
	Hand Tools	Fasteners	Textiles	Plastic	Auto Components	Others
Dies	√	√		√	√	√
Gauges, Jigs fixtures	√					
Job work, Forgings	√	√	√	√	√	√
Others	√				√	√

While the above is the status with respect to the services and markets served by the CIHT, there is no formal need assessment undertaken to estimate the market opportunity for its services. Targets are not linked to the market opportunity or desired level of impact. Linking these two parameters will be an advantage in marketing and expanding its services. Visit to manufacturers brought out abundant market available for moulds for sports goods provided CIHT can upgrade its operations and expertise in the design and manufacture of moulds for plastics.

CIHT has recently started working in the new field of Core Shooter Dies for valves. It has upgraded skills of employees in design and fabrication of such dies.

Contribution

The break-up of revenue contribution (cash basis) for 2010-11 from various services is given in the table below:

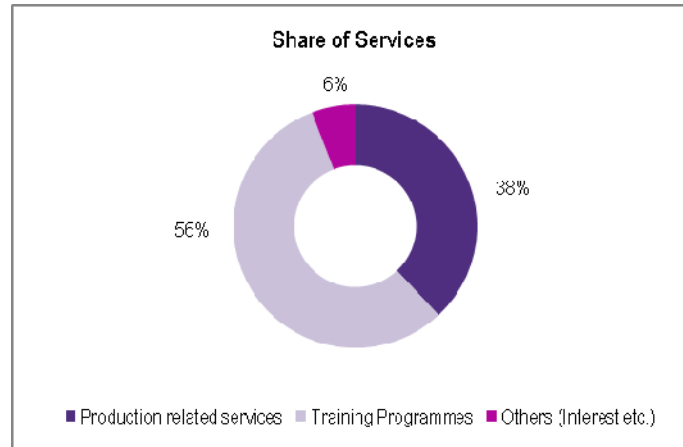
Table 5: Sources of revenue

Activity	Revenue in Rs. In lakhs
Production related services	113.60
Training programmes	167.88
Others (interest, testing/calibration etc)	17.30
Total	298.78

Table 6: Sector mix of revenue from production of services (Average of 2006-07 to 2010-11)

Production Service	Percentage of Income
Forging Dies	25%
Other production aids	25 %
Components	50 %

Figure 2: Share of services

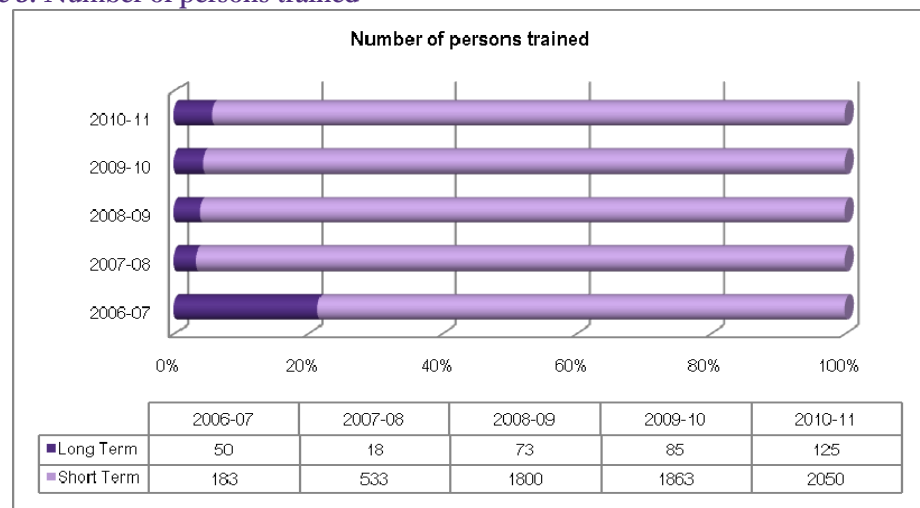


The maximum revenue is generated by training services in the service mix of CIHT, which has contributed 56% of total income in 2010-11. In terms of production, average of last 5 years shows 50% contribution from components, 25% from forging dies and 25% from other production related aids. The contribution of income from training to total income has been steadily increasing every year, up from 6% in FY 2006-07 to 56% in FY 2010-11. CIHT has to increase its share of tooling if it desires to keep its reputation of a tooling institute. Fixing of targets in this regard and aggressive marketing is needed. The targets for this must indicate the share of MSMEs. Maximum revenue of training services is from short-term courses. It has increased from 76% in 2006-07 to 93% in 2009-10.

Training

CIHT Jalandhar has a good reputation in training. In 2010-11, CIHT trained 2175 persons, 125 trainees in long-term training courses and 2050 trainees in short-term training programmes. Trend from 2006-07 to 2010-11 is given in Figure 3.

Figure 3: Number of persons trained



Trainees in short-term courses have increased in higher proportion than in long-term courses. The prime reason which can be attributed to the fact is that CIHT has only one long-term course which started only four years ago with an intake of 20. First batch of this course has just passed in 2011. CIHT has still to build reputation in long-term courses on the performance of these trainees in the

industry. There is higher revenue earning in short-term-courses at relatively less cost, against the backdrop of financial sustainability being the key performance area. The trainees for short duration programmes are primarily personnel already working in the industry and students from engineering colleges, ITIs or polytechnics who undergo these training courses to improve their practical skills.

The admission in Diploma in Tool and Die Making is through Joint Entrance Test conducted by the Punjab State Board of Technical Education and Industrial Training (PSBTE&IT). Course contents are also approved by them. The course has been approved by AICTE. Course contents of short-term courses are developed as per the requirement of the industries. However, no special training programme has been organised for industries/ Government in the last five years. 75% of the overall curriculum involves on-the-job training.

To assist the Hand Tool sector, a Technical Library and Documentation Centre has been set up and is functioning and well utilised.

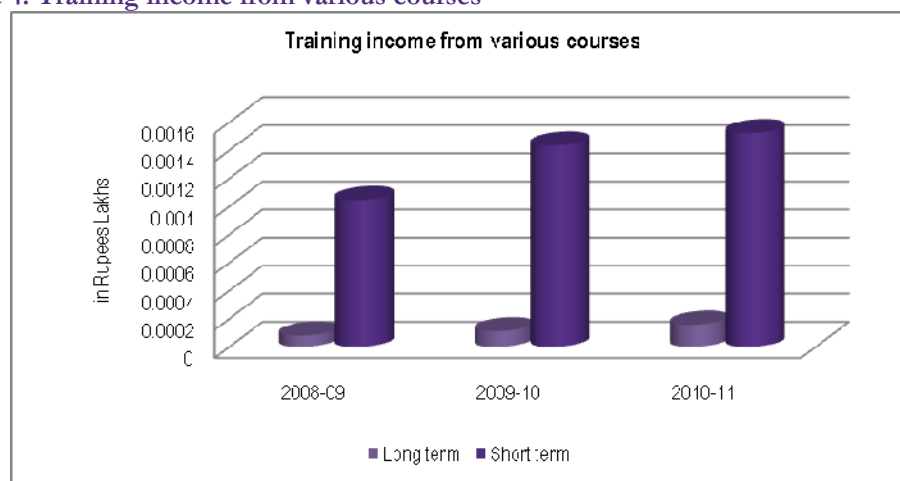
Training income

Given below is a break-up of the training income received from long-term and short-term courses.

Table 7: Training income from various courses

Training Courses	2008-09	2009-10	2010-11
Long Term Courses	8.02	11.13	15.74
Short Term Courses	104.56	143.38	152.29

Figure 4: Training income from various courses



Scholarship and fee waiver

Tuition fees/training fees etc of SC/ ST students are reimbursed by the Ministry of Micro, Small & Medium Enterprises, Government of India. For the year 2010-11, Rs.107.99 lakhs was reimbursed for 1441 SC & ST students. Response from SC/ ST candidates is more as they do not have to pay fees which are covered by MoMSME.

Placement and tracking

CIHT had a 100% placement record for its long-term programmes' first batch in 2011. It arranges around 50% placement of trainees from short-term courses. Rest 50%, many short-term trainees are from industry or colleges and polytechnics and go back to them and thus do not need placement after completion of such courses. Majority of the candidates placed are recruited by MSMEs.

Pricing of services

Tooling and job work

The pricing for any tooling job and production is based on the following formula:

$$\text{Cost} = \sum [\text{Machine hour rates} \times \text{Number of hours on the machines}]$$

The machine hour rates take into account the following components:

- Machine price
- Machine depreciation
- Building depreciation
- Electricity
- Consumables
- Maintenance labour
- Overheads (wages, administrative expenses)

Earlier the machine hour rates were revised by the Principal Director. The rate list was updated/ revisited on an annual basis.

In 2011, a cost accountant was retained who did detailed calculations. His recommendations were reviewed by a Committee constituted by the Governing Council. The Committee studied recommendations of the cost accountant and the market rates. Present rates were approved keeping the recommendations of the Committee in view.

Quotations are given on fixed-cost basis. CIHT allows 25% discount on machine hour rates to MSMEs. The amount of discount allowed to MSMEs is not reimbursed by the Government/ other agencies to the Tool-Room.

A suggestion has been made to promote MSMEs. CIHT should give significant discount to MSMEs which should be reimbursed by DC MSME to CIHT like fees of SC/ ST trainees. This will be examined collectively for all Tool- Rooms.

Training

Fees are market determined and fee reference of similar institutes like CTR Ludhiana etc. is taken for fixing the fees. Training fee of Diploma in Mechanical Engineering (Tool & Die) is approved by office of DC MSME, New Delhi and Punjab State Board of Technical Education and Industrial Training, Chandigarh. This course is highly subsidised. While it costs CIHT Rs.1.97 lakhs (which includes all types of expenses like establishment expenses, machinery, raw material costs, administration and salary expenses etc.) per trainee per annum, a fee of only Rs.30000/- per year is charged from each trainee and that also is paid by MoMSME, DC MSME for SC/ ST trainees. Fees of short-term courses are approved by the Principal Director, CIHT.

Marketing

System

CIHT does not have a marketing department as such. Concerned officers market their own products. They are given annual targets which are communicated to the GC as well as DC office. The progress is reviewed on a monthly basis. Both are closely monitored by the General Manager.

Strategy

The CIHT participates in exhibitions and trade fairs on a regular basis. The team also sends brochures to various industries and associations. The Tool-Manufacturing Incharge makes regular visits to old and new customers and follows up to assess their requirements. Marketing team also makes periodical industrial visits to their regular customer, tap new customers and maintains a mailing list of customers to whom they periodically send promotional brochures and training calendars.

Study through discussions with industrialists has revealed a huge potential market for moulds of sports' goods. CIHT can handle this provided personnel are trained in design and manufacture of these moulds. It needs marginal addition to the equipment. So far no attempt has been made in this direction.

For training, CIHT taps the demand from the industry and available infrastructure with ITI, polytechnics and engineering colleges in the region.³

Constraints

CIHT, however, does not have a marketing strategy for its tooling based on market assessment, or any study or survey of market needs and market segmentation which is necessary to contribute more for the development of MSMEs and increase share of tooling. It would be useful for the marketing team to have a strategy which is based on market need assessment and segmentation.

Client Profile

Given the profile of industry in Punjab and adjoining states, the maximum demand of tooling is for forging dies, press tools, moulds and dies etc. The CIHT has developed expertise in forging dies, forging of hand tools, pipe fitting and general engineering items. Forging can be done from 250 gm to 15 kg in weight.

The major products of CIHT are forging and forging dies for hand tool industry, revenue from which forms 75% of the revenue from production-related services. Next is heat treatment, including heat treatment of auto components. CIHT, thus, does not tap auto component market which is the most growing industry in the country today with a CAGR of 21%. This is followed by plastic, rubber and glass which together contribute 12%.

Major clusters served by CIHT are hand tools, pipe fitting, railway parts and valve industry. Majority of the clients of the Tool-Room are MSMEs from the region.

Types of industries served – MSMEs assisted

The share of MSME customers in numbers has increased from 95.4% in 2006-07 to 98.9% in 2010-11. In terms of value, MSMEs accounted for 99% of the revenue from production-related services during the last 5 years. Although MSMEs complained of high prices from CIHT, their response shows that they find the prices reasonable.

The table below provides trend in share of MSME customers to total customers of the CIHT, in numbers:

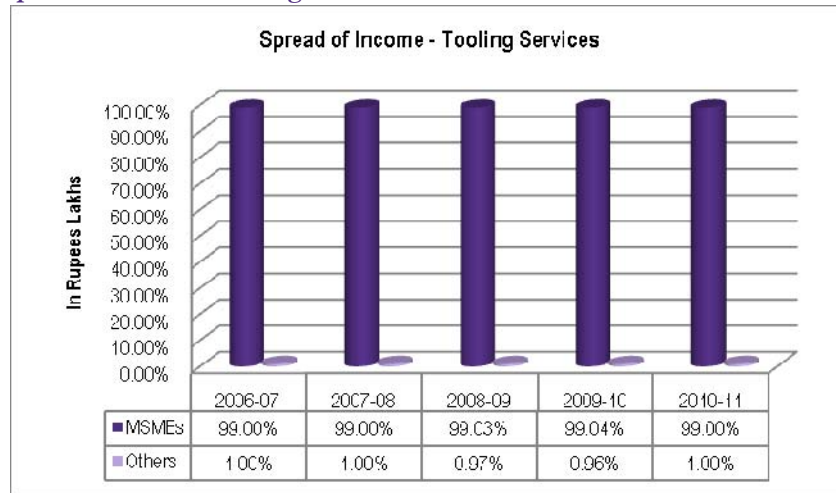
³ The CIHT also has a website <http://www.ciht.in>

Table 8: Industry break-up- CIHT Jalandhar

Type of Industry	2006-07	2007-08	2008-09	2009-10	2010-11
MSMEs	95.40%	97.80%	99.64%	98.90%	98.92%
Large Scale	4.60%	2.20%	0.36%	1.10%	1.08%

The share of MSMEs and large enterprises in CIHT's revenues is indicated in the bar chart in Figure 5.

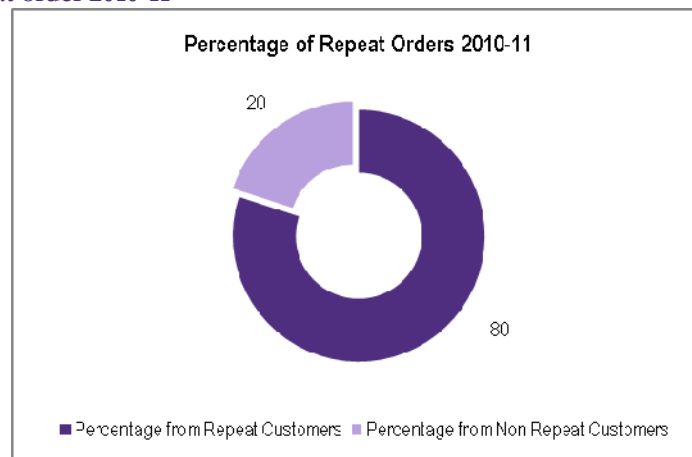
Figure 5: Spread of income: tooling services



Proportion of Repeat Orders

CIHT scores well on customer satisfaction and retention. During the last 5 years more than 75% of CIHT's customers have been repeat customers. However, the percentage of repeat customers has declined from 86% to 80% from 2008-09 to 2010-11. The data for 2010-11 is shown in Figure 6:

Figure 6: Repeat order 2010-11

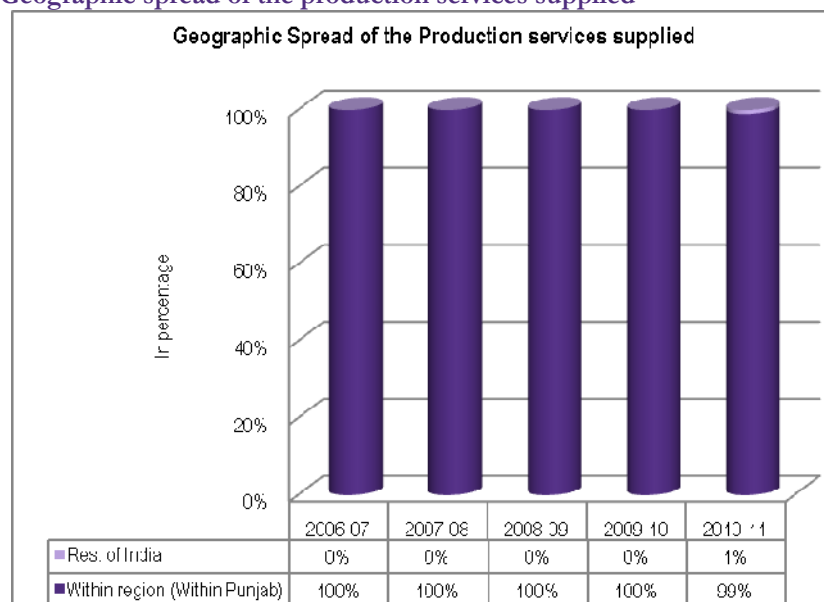


Geographic spread of the clients for tooling services

As indicated in the chart below, for production-related services, mostly all the customers are from within the region in last five years. In 2010-11, 1% of the customers were from outside the region.

The trend is good as this indicates that the Tool-Room is promoting MSMEs in the region. Pattern is reflected in Figure 7.

Figure 7: Geographic spread of the production services supplied



Physical and technical infrastructure

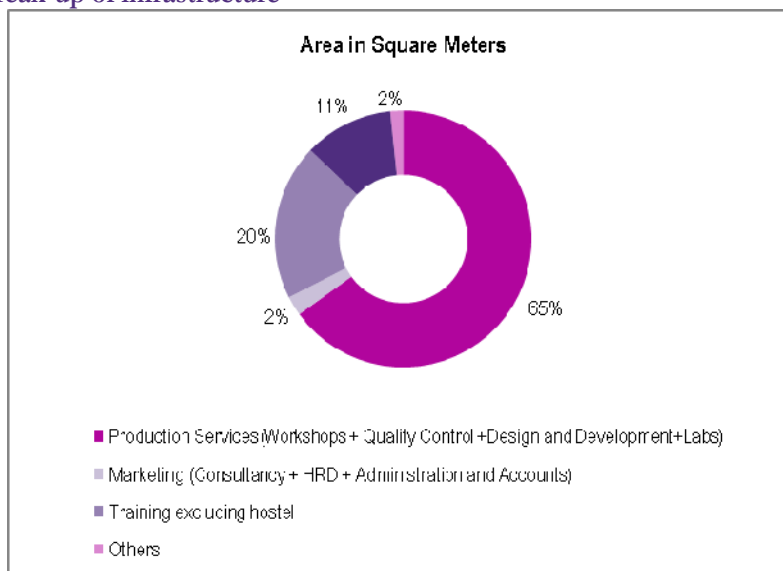
Physical infrastructure

CIHT is a well-equipped public commercial Tool- Room in the Northern Region. It is located in the industrial area in Jalandhar. The total built up area of CIHT is 3175.10 square metres. The built up area for the various departments is given in Table 9 and Figure 8.

Table 9: Facility break up of CIHT Jalandhar

Facility	Area in Square Meters
Production Services(Workshops + Quality Control+ Design and Development + Labs)	2065.00
Marketing(Consultancy + HRD + Admin and Accounts)	77.70
Training excluding hostel	624.00
Hostel	357.00
Others	51.40
Total	3175.10

Figure 8: Break-up of infrastructure



Utilities

CIHT is supplied power at high tension by Punjab State Electricity Board. It steps it down and distributes through its own electrical sub-station. All high-precision machines are in the air-conditioned machine enclosures. Besides this, CIHT also has submersible pumps and water tanks for water supply system. CIHT has power back-up which can feed all the critical equipment in case of power cut by PSEB. Specifications of the back-up systems are as below:

Table 10: Power back-up

Capacity	Flexibility for use
Connected Load	1500 KVA
Two DG Sets capacity 320 KVA and 125 KVA	Can feed power to computers in case of power cut

CIHT depends on outside supplies for oils, greases, welding gases.

Equipment in production related services sections;

Under Indo-UNDP Technical Co-operation Programme, CIHT was equipped with high-tech equipment needed at that time. Subsequently, the plant and machinery has been augmented and upgraded from time-to-time.⁴

Appropriateness of technology

The available equipment at CIHT has the capacity to meet present demands with respect to accuracy, complexity and physical size of tools. It has hardware and software for CAD/ CAM including simulation software for hand tools. It also has equipment to manufacture moulds for plastic and press tools for sheet metal industries which will need marginal augmentation. However, as mentioned above, it needs expertise in design and machining and fitting operations to handle such tools.

⁴ List of high-technology machines is given in Annexure III.

Discussions with representatives of industry in Jalandhar indicate that with manufacturing industry growing at fast rates, particularly in sports industry, demand for more accurate tooling involving more complex technologies and faster deliveries (due to frequent change of models) is growing.

Equipment in the training department

Training Department was originally equipped for short-term courses. It included hardware and software for courses in CAD/ CAM focussed on requirement of hand tools industry. There is a hydraulic lab and a pneumatic lab.⁵ More machines were added while starting Diploma in Tool and Die Making. High end CNC machines added to production facilities are used to cover this part of the curriculum.

Design and development

The design department plays an important role in the success of a Tool-Room. Its services include product design and tool design before the tools are taken up for production. CIHT has a design office which can handle design of simple forging dies. It can simulate functioning of dies needed for hand tools. Expertise for design of moulds needed by sports industry needs to be developed if it has to tap this fast growing market.

Human resources

CIHT Jalandhar has employee strength of 60. In addition to the Principal Director who is the Chief Executive, CIHT has the following personnel:

Table 11: Personnel

Department / Designation	Dy. Director	Assistant Director	Engineer	Assistant Officers	Technician	Others	Others (including driver etc.)
Administration				1		4	9
Design				2			
Forge Shop		1	1				
Heat Treatment		1					
Tooling		1			27		
Training	1	1	2				
Testing		1	1				
Accounts				1		4	
Sub total	1	5	4	4	27	8	9
Total	58 (60 including Principal Director and his Secretary)						

Manpower mix at CIHT is quite appropriate with regard to the numbers and expertise for the range it is presently covering.

CIHT also employs a large number of operators on contract as and when needed (16 on day of visit), and at levels needed, which is cheaper as it costs Rs.6,000/- to Rs.10,000/- per month against Rs.20,000/- to Rs.35,000/-, which CIHT may have to pay in case of regular employees.

⁵ Detailed list is in Annexure IV.

Skill up-gradation/ capacity development need

Skill and knowledge development programmes are needed for employees. Apart from acquiring new skills and knowledge, such programmes enhance employee motivation. CIHT is aware of the importance of such programmes and deputed its employees to such programmes.⁶

Retention

The retention pattern is reflected in the table given below:

Table 12: Retention Pattern

Number of years at CIHT	More than 10	More than 5, up to 10	More than 3, up to 5	Up to 3
Total number of employees	16	4	9	31

Incentive scheme

Tool- Rooms under DC MSME have been allowed to adopt incentive schemes based on the overall guidelines and limits decided centrally by DC MSME. The scheme lays stress on increasing generation of surplus of income over expenditure, 25% of which is allowed to be distributed to the employees based on the following factors:

- Basic Pay + Grade Pay +Dearness Allowance subject to maximum sealing on basic pay of Rs.8560/-; those with basic pay of more than Rs.8560/- are paid incentive based on Rs.8560/-basic pay (revised after implementation of 6th Pay Commission Recommendations)
- Number of days of attendance in the financial year over the Tool-Room working days
- There is a maximum sealing on payment of four months of Basic Pay + Grade Pay + Dearness Allowance subject to maximum sealing on basic pay of Rs.8560/-
- Contractual employees are also paid incentives based on the number of days they have worked and their wages

CIHT has not yet qualified for incentive under this scheme because they have not yet recovered costs, not even without depreciation. An incentive scheme, specific to CIHT, to motivate employees from the present level, should be considered.

Operational efficiency

Lead time price and quality

CIHT Jalandhar is known for the quality of its tooling. However, lead times are long and price level high as per the industry. Price is offset to some extent by 25% discount which CIHT allows to register MSMEs. The amount of such discount is not reimbursed to CIHT from any source.

Machine utilisation

Utilisation data for 10 critical machines at CIHT in production-related services was examined. Ideally, critical machines should be used round the clock, except CMM which is used in one shift. Since Tool-Room operations are non-repetitive and all tool parts need different routing and scheduling, the utilisation target could be 85%. CIHT's position is given in Table 13.

⁶ Some of the programmes attended recently are listed in Annexure V.

Table 13: Machine utilisation

S. No.	Description	Number of hours in 2010-2011
1	Installed capacity ⁷	63616
2	Number of hours utilised	17981
3	Utilisation of machines	28%
4	Utilisation if capacity is calculated in 2 shifts	42 %

Machines are underutilised. Improvement of capacity utilisation would ease the pricing level as overheads would spread more evenly. Machine hour rates will come down as depreciation and other fixed costs will be spread across a greater number of machine hours.

Financial analysis

Analysis has been done on the performance data for the last five financial years from the CIHT's Annual Reports made available for the following indicators:

- Net worth
- Profitability analysis
- Trend of income and expenditure

Net worth

The net worth of an enterprise is the sum of total equity and retained earnings. Net worth reflects the value of the enterprise, considering it is composed primarily of the money that has been invested in it since its inception, as well as the retained earnings for the duration of its operation. Net worth of CIHT is shown in Table 14.

Table 14: Net worth trend over 5 years

Particulars	2005 – 06	2006 - 07	2007 - 08	2008 - 09	2009 -10
Net worth	97,300,760	114,234,957	128,848,168	141,635,125	147,645,539
Year on year increase		17%	13%	10%	4%

The net worth of CIHT, Jalandhar has been increasing on an average of 11% during the last four years, which is a healthy sign as it implies an increase in equity or value of the Tool-Room. During the years, the Tool- Room was also in receipt of government grants.

Table 15 reflects the trend of Government grants being received by CIHT, Jalandhar:

Table 15: Government Grants

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10
Contribution from GOI	26,070,000	24,200,000	22,500,000	18,000,000	13,800,000

⁷ Calculation of installed capacity:

Days in a year	=	365
(Less) Sundays	=	(52)
Holidays & second Saturdays	=	(29)
Net working days	=	284
Number of Hours on 24x7 basis (296x24) per machine	=	6816
Number of hours on 24X7 basis (284X24 x19) for 9 machines + 8X284	=	63616

Net worth of the Tool- Room excluding the Government grants received is given in the Table 16. It is now positive even without Government grants, which is laudable.

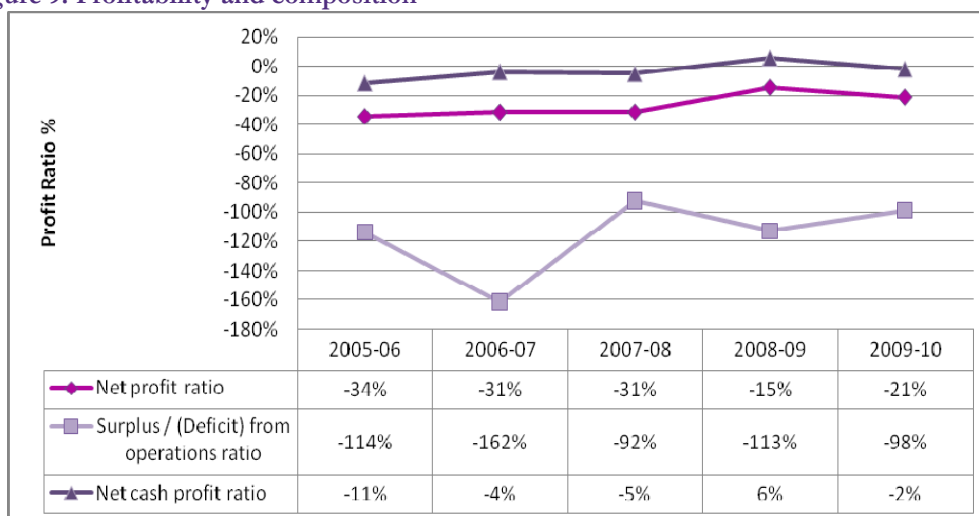
Table 16: Net worth without Government grants

Particulars	2005 - 06	2006 – 07	2007 - 08	2008 - 09	2009 -10
Net worth excluding government grants	71,230,760	90,034,957	106,348,168	123,635,125	133,845,539
Year-on-year increase		26%	18%	16%	8%

The net worth of the Tool-Room has shown a positive trend even without Government grants. Although, the increase is only marginal, the same implies that the Tool-Room is generating enough revenue to sustain its operations.

Profitability analysis

Figure 9: Profitability and composition



The Tool-Room is incurring a deficit on its operations. Revenue from operations is not sufficient to cover the expenses incurred.

The deficit from operations has reduced from 114% in FY 2005-06 to 98% in FY 2009-10. However, the deficit is still huge for the Tool-Room to be in a position to generate a surplus from its operations in the coming years.

The difference between net profit and net cash profit is on account of depreciation which is a non-cash expenditure. It comprises 18% of the total expenditure on an average. Over the last five years, establishment expenses constituted the biggest share of total expenditure with an average of 52% of the total expenses, other production and administrative expenses were at an average of 30% and depreciation at an average of 18%. The ratio of depreciation to total expenses has remained constant. However, percentage of establishment expenses has increased from 45% in FY 2005-06 to 63% in FY 2009-10.

The Tool-Room is not contributing any income from the sale of finished goods. Revenue from tooling and production is contributed only from income from services which has declined from 56% in 2005-06 to 22% in 2009-10. Income from training has increased from 5% in 2005-06 to 39% in 2009-10.

The income from other sources comprises mainly of grants/ subsidies. The income from other sources as a percentage of total income is significant and constitutes an average of 41% of the total income over the past five years.

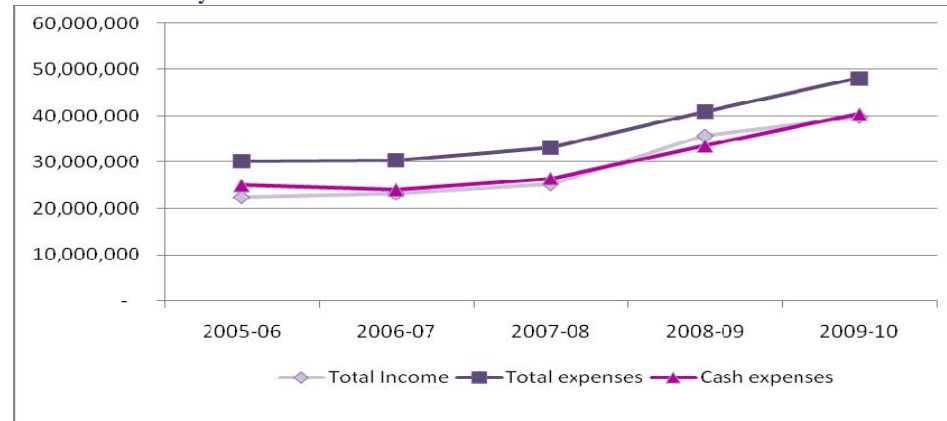
Trend of income and expenditure

Grant Thornton did a trend analysis of the income and expenditure of CIHT, Jalandhar based on the audited financial statements provided for the five years ending March 31, 2010. Given below is a diagram reflecting the relationship between the income, expenses and cash expenses:

Table 17: Trend of income and expenditure

Particulars	2005 - 06	2006 - 07	2007 - 08	2008 - 09	2009 -10
Total income	22,479,988	23,205,519	25,275,369	35,701,448	39,750,007
Total expenses	30,175,409	30,471,322	33,162,158	40,914,491	48,166,058
Cash expenses	25,034,068	24,065,291	26,531,580	33,641,847	40,473,943

Figure 10: Trend analysis



The Tool-Room is operating in deficit for last five years from FY 2005-06 to FY 2010-11 except in FY 2008-09 where it was able to meet its cash expenses from its revenue.

The cash expenses have been increasing at the rate of 13% similar to the rate of total expenses which also have been increasing at a rate of 13%, but are still less than the rate of increase in revenue of the Tool-Room. Hence, keeping other factors constant and based on the average rates computed, the profitability of the Tool-Room shall only improve with time.

Chapter IV

Overview of Local Business Environment from Tool-Room Perspective

This chapter assesses the location of the Tool-Room and the market potential for it to expand its services. It also analyses the availability of raw material and machinery suppliers in the region.

Location and market potential

Jalandhar is located on Delhi-Amritsar highway and railway trunk route between them. Nearby airports are Amritsar, Chandigarh and Delhi. CIHT is located in midst of concentration of industries. Sports industry is prominent but CIHT at present is not equipped to handle the type and technology they want. CIHT has to upgrade its expertise to tap this market.

For forging dies, which CIHT manufactures, customers generally give their own materials for cavity making. Drop forging dies need heavy blocks of die steel. One average die material costs about Rs.80000/-, while CIHT charges about Rs.25000/- for the same. In terms of turnover, therefore, it is Rs.25000/-, while cost of die is Rs.105000/-. While it reduces absolute turnover, it does not affect the income-expenditure gap.

The supplier chain

Raw material suppliers

Tool steels used all over the country for making critical parts like cores and cavities of moulds are imported from Germany, Austria, Poland, Japan and Sweden, and for less critical applications from Taiwan and China. There is a large network of importers and stockists in the country with major concentration in Mumbai and Chennai. Local stockists in Jalandhar can supply limited range. CIHT operations in tool making, forging dies for drop hammers, use materials generally provided by clients that holds less importance for it.

Machinery suppliers

There are two kinds of machines at the CIHT, conventional and precision. The conventional machines are from domestic manufacturers. CIHT has the know-how to service such machine tools in-house. The other kinds of machine tools are CNC machine tools and other precision machines which are, to some extent, produced in the country. However, high-end machine tools of this category are imported mainly from Switzerland and Germany and lately also from China, where less accuracy and versatility are acceptable. A few of these machine manufacturers have representatives based in Jalandhar who offer an advantage in liaisoning with zonal offices and headquarters in Kolkata, Mumbai, Bengaluru, Delhi and Chennai for enquiries, servicing and attending to breakdowns.

Summary of backward linkages

Summary of backward linkages is given in Table 18.

Table 18: Backward linkages

Input	Linkage/ sources
Raw Materials	Users provide raw materials.
Machine Tools	Manufacturers for indigenous machines. Direct imports for imported machines, nearly all such suppliers have agents in India for liaison and service back-up.
Standard moulds and die sets	CIHT operations do not need these as they do not handle moulds and dies which need these standard parts.
Cutting tools	Manufacturers and stockists sufficiently present in Jalandhar
Consumables like oils, greases, salts	Stockists in Jalandhar
Spares	From OEMs except for standard spares like bearings which are available locally to some extent and from stockists in Kolkata and Mumbai.
Specialised Maintenance/ Servicing of CNC Machines	By the machinery suppliers. In case of imported machines, this is provided by agents of the foreign suppliers through annual maintenance contracts which tend to be expensive. Service agents are based at the headquarters of the agent and arranged on need basis.

Chapter V

Inclusive Growth underlined by Social Impact

CIHT has made impact in all the three areas of training and production dies for hand tool industry and also forgings for them.

The CIHT trained 125 trainees in long-term courses and 2050 trainees in short-term courses in 2010-11. Since majority of these trainees are from the region as mentioned above, it is a great regional booster to which CIHT is contributing socially.

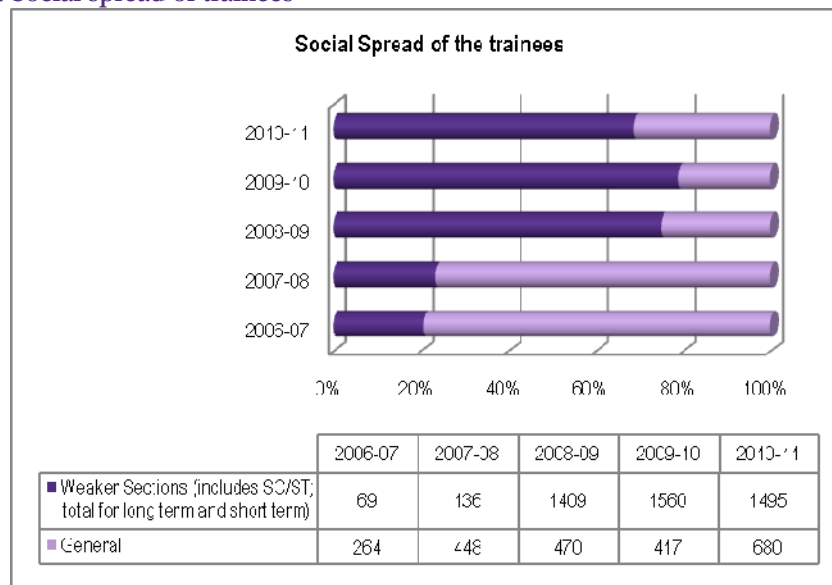
Environment

CIHT brought the technology of drop hammer forging and disseminated the same to the hand tool industry of the region. Earlier it used pneumatic hammers. Today nearly the whole of hand tool industry in Jalandhar uses drop hammers. CIHT has now introduced press forging process and heating by induction heater which is cleaner and environment friendly. This will be the next new technology brought by CIHT which the industry will adopt from it, like drop hammers earlier.

Social spread of trainees

Social spread of trainees at CIHT Jalandhar is reflected in the Figure 11:

Figure 11: Social spread of trainees

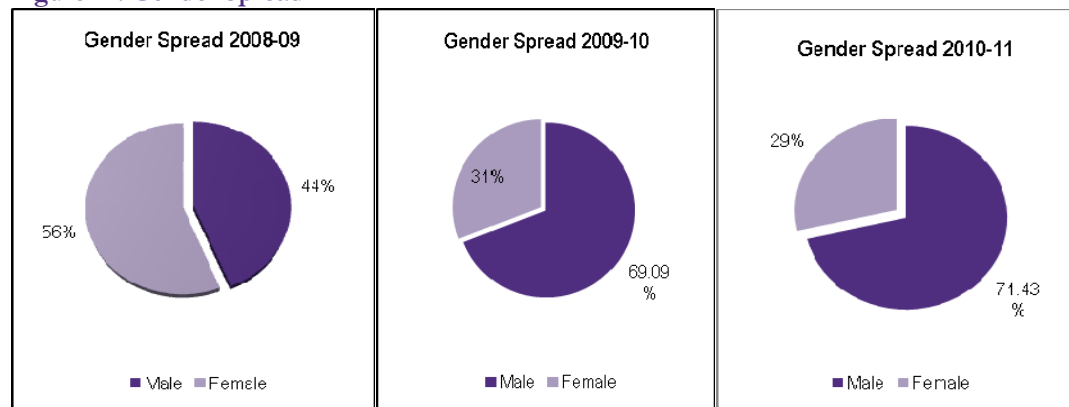


Proportion of SC/ ST trainees is increasing as they do not have to pay fees.

Gender spread

Given below is the gender spread in CIHT for its long- and short-term courses for the last three years. Keeping in view, that most of the training courses run by it are for industries where women participation is less, representation of women in its training programmes is good. No special incentive is provided to encourage women to participate in the training. Trend in the last three years is given in Figure 12.

Figure 12: Gender Spread



The impact of CIHT in terms of the development of human resource for the industry is still limited and needs to be scaled up. The number of trainees is marginal in comparison to industry demand (Auto component industry needs additional manpower of more than 35 million over next 10 years).

SWOT

Strengths

- CIHT is a well equipped commercial Tool-Room in the Region
- It is set up with development objectives and offers its services without commercial objectives.
- It has expertise in manufacture of dies for forging for hand tools and common facilities for forgings.
- It has earned great reputation for its training programmes.
- It offers good training expertise.

Weaknesses

- Utilisation of machine capacity even in critical areas is about 28%.
- Lack of expertise in the design and manufacture of moulds for industry around it.
- Price of tools is high for MSMEs.
- Delivery periods are long.
- CIHT does not have independence to adopt its own incentive scheme. Incentive scheme allowed by DC MSME is not working.
- Over the years emphasis has shifted from production to training to earn revenue which is monitored.
- It depends on Government grants even for recurring expenses.

Opportunities

- Industry thinks high of expertise at CIHT in training.
- Significant scope for scaling up training and tooling services given the favourable market conditions
- Abundant demand for tooling. Tooling demand in 2010-11 was Rs.13225 crores. It is growing at 13% CAGR. Of the total demand, 31 % was met by imports.
- Tooling demand is estimated to grow to Rs.23620 crores by 2015(source: TAGMA)
- Abundant demand for tools from local sports goods industry.
- Huge national requirement of trained manpower.
- Government support for capital investment is available.

Threats

- Monitoring based only on indicators of self sustainability has a diluted impact on MSMEs.
- Easy procedures and low customs duties for import of tools. TAGMA's latest survey indicates that 31% tools were imported in the country in 2010-11.
- Low price levels and faster deliveries of tools from some countries, especially China.
- MSMEs prefer low costs of tools.

Conclusion

CIHT has made progress and impact in creating skilled manpower. It was set up to make dies for hand-tool industry, which are simple and easy to design and manufacture. It has contributed in making such dies and also forgings for hand tool industry. Later more machines including CNC machines were added to upgrade its operations for handling moulds for plastics and press tools for sheet metal components. However, no organised attempt was made to develop expertise in design and manufacture of such tools. If capacity is calculated on three shift basis, utilisation is only 28%. Intervention is needed in this regard. It has contributed to inclusive growth with focus on weaker sections and empowerment of women.

On financial account CIHT does not recover costs even without depreciation. It can do so, and move beyond that, if it can develop expertise to make mould for sports industry whose present requirement is met by imports from China.

The policy direction and monitoring indicators give weightage to self sustainability which needs to be revisited as the impact on MSMEs is of equal significance. Over emphasis on cost recovery and related financial indicators has resulted in reduced impact on tooling front. It is also necessary that CIHT develops an understanding of the current and emerging MSME needs, especially local clusters. A formal survey of the MSME market relevant to the CIHT is needed for this purpose. This would be essential to establish short- and long-term targets with an eye on impact

Annexure I

Details of Visits

Details persons met during visit of GT Team to CIHT Jalandhar

Name of Organisation	Name of person	Designation
Central Institute of Hand Tools, Jalandhar	Shri A.K.Bathla	Principal Director
	Shri R.K.Sahni	Deputy Director
	Shri N.P. Singh	Lecturer
Victor Tools Pvt. Ltd.	Shri Sukh Dev Raj	Managing Director
Ajay Industries	Shri Rajat Goswami	Partner
	Shri A.K. Goswami	Partner
TK Sports (P) Ltd.	Shri Rajan Kohli	Managing Director
State Engineering Corporation	Shri Mihinder Singh	Partner

Annexure II

Training Courses

Course	Duration	Fee/student	Support from Ministry of MSME/Others (State etc.)	Intake	Selection Criterion	Certification by	Typical job on placement	Post Placement Tracking	Soft Skills	Entry Level Salary and Growth
Long Term										
Diploma in Mechanical Engineering (Tool & Die)	4 years	Rs. 30,000 per year	Fee reimbursement to CIHT for SC/ST from Ministry of MSME, New Delhi & assistance to Minorities from Punjab State Govt.	40	10 th	Punjab State Board of Technical Education & Industrial Training	Supervisor/CNC Machine Operator.	-	These are included in curriculum.	Rs. 6500/- p.m. to Rs. 10,000/- p.m. and growth as per achievement.

Course	Duration	Fee/student	Support from Ministry of MSME/Others (State etc.)	Intake	Selection Criterion	Certification by	Typical job on placement	Post Placement Tracking	Soft Skills	Entry Level Salary and Growth
						ng, Chandigarh.				
Short Term										
Auto CAD	60 hrs.	5000	Fee reimbursement to CIHT for SC/ST from Ministry of MSME, New Delhi	40	Degree/ Dip. in Engg./ ITI/10	CIHT	-	-	-	Entry level salary will depend as per qualification, skill improvements
CAD	60 hrs.	6000		30		CIHT	-	-	-	
CAM	60 hrs.	6000		30		CIHT	-	-	-	
CAD & CAM	120 hrs.	11000		40		CIHT	-	-	-	
On job training on CNC Lathe Machine	3 months	3500 p.m.		10	ITI in Mech. Trades	CIHT	CNC Lathe Operator	-	-	
On job training on CNC Milling Machine	3 months	6000 p.m.		10	ITI in Mech. Trades	CIHT	CNC Milling Machine Operator	-	-	-
On job training on Conventional Lathe Machine	3 months	3000	-do-	10	10 th	CIHT	Lathe operator	-	-	-
On job training on Conventional Milling Machine	3 months	3000	-do-	10	10 th	CIHT	Milling Machine Operator	-	-	-
Tool & Die Maker	6 months	3000	-do-	10	10/10+2/ITI	CIHT	Tool & Die Maker	-	-	-
Welder	3 to 6	3000	-do-	10	8 TH	CIHT	Welder	-	-	-

Course	Duration	Fee/student	Support from Ministry of MSME/Others (State etc.)	Intake	Selection Criterion	Certification by	Typical job on placement	Post Placement Tracking	Soft Skills	Entry Salary and Growth	Level
	months										
Die Fitter	3 months	3000	-do-	10	8/ 10/ 10+2/ ITI	CIHT	Die Fitter	-	-	-	
Plastic Moulding	1 month	3000	-do-	10	8 TH	CIHT	-	-	-	-	
Carpenter	3 to 6 months	3000	-do-	10	10	CIHT	Carpenter	-	-	-	
EleCIHTician	3 to 6 months	3000	-do-	10	8/ 10/ 10+2/ ITI	CIHT	EleCIHTician	-	-	-	
Workshop Practice – Grinding	3 months	3000	-do-	10	10 th	CIHT	Grinder Man	-	-	-	
Workshop Practice –Turning	3 months	3000	-do-	10	10 th	CIHT	Lathe Operator	-	-	-	
Workshop Practice – Milling	3 months	3000	-do-	10	10 th	CIHT	Milling Machine Operator	-	-	-	
On job training on CNC Wire Cut Machine	1 month	6000	-do-	10	ITI in Mech. Trades	CIHT	-	-	-	-	
On job training on Electric Discharge Machine	3 month	3000	-do-	10	ITI in Mech. Trades	CIHT	EDM Machine Operator	-	-	-	
PLC and its applications	1 month	5000	-do-	25	B.Sc./ Degree/ Diploma / ITI/ 10+2/	CIHT	-	-	-	-	

Course	Duration	Fee/student	Support from Ministry of MSME/Others (State etc.)	Intake	Selection Criterion	Certification by	Typical job on placement	Post Placement Tracking	Soft Skills	Entry Salary and Growth	Level
					10						
Computer Hardware and Networking	1 month	3500	-do-	25	-do-	CIHT	-	-	-	-	
Micro Controller Embedded and its applications	1 month	5000	-do-	25	-do-	CIHT	-	-	-	-	
Printed Circuit Board Designing	15 days	5000	-do-	25	-do-	CIHT	-	-	-	-	
Basic Electronics & its application	15 days	5000	-do-	25	-do-	CIHT	-	-	-	-	
Personality Development	1 month	7000	-do-	20	Degree/ Diploma / ITI/ 10+2/ 10	CIHT	-	-	It is part of curriculum	-	
Marketing Management	2 weeks	7000	-do-	20		CIHT	-	-	-	-	
How to appear in an interview	2 weeks	7000	-do-	20		CIHT	-	-	-	-	
Entrepreneurship Development and Marketing Management	1 month	7000	-do-	20		CIHT	-	-	-	-	
Chemical Analysis of Iron & Steel	1 month	3000	-do-	10		CIHT	-	-	-	-	
Measurement &	1 month	3000	-do-	10		CIHT	-	-	-	-	

Course	Duration	Fee/student	Support from Ministry of MSME/Others (State etc.)	Intake	Selection Criterion	Certification by	Typical job on placement	Post Placement Tracking	Soft Skills	Entry Level Salary and Growth
Calibration										

Annexure III

Production Equipment

Production Equipment											
CNC M/cs	Type	Make/Model	Max Wt	Job	Axes	Accuracy	Year of Installation	Number of Hours utilised			
								2010 – 11	2009 – 10	2008 – 09	2007 – 08
CNC VMC HMT	VMC	HMT	500		3-Axes	± 0.005	2002-03	2812	1905	864	1260
CNC VMC DAEWOO	VMC	DOOSAN DAEWOO	800		3-Axes	± 0.003	2005-06	2975	2430	2404	1620
CNC TURNING CENTRE	TURNING CENTRE	BATLIBOI	100		2-Axes	± 0.005	2002-03	1627	336	384	1080
CNC EDM	EDM	OSCAR MAX	500		4-Axes	-	2008-09	1440	1340	881	-
CNC WIRE CUT	WIRE/EDM	ELECIHTONICA	300		2-Axes	± 0.005	2004-05	1558	1244	560	640
CNC CMM	3D CO-ORDINATE MEASURING	RUBY ELECIHTONICA	500		3-Axes	± 0.001	2005-06	10	12	08	62
CNC DRILL	BATLIBOI	BATLIBOI	500		4-Axes	± 0.005	2007-08	627	307	120	-

Production Equipment										
CNC M/cs	Type	Make/Model	Max Job Wt	Axes	Accuracy	Year of Installation	Number of Hours utilised			
							2010 – 11	2009 – 10	2008 – 09	2007 – 08
TAP CENTRE										
CONV. M/CS.										
ONE TON HAMMER	DROP HAMMER “B” TYPE	BECHE/1983	1.5 KG	-	-	1984	1822	579	717	1167
TWO TON HAMMER	DROP HAMMER “B” TYPE	BASANT/ 2001	12 KGS.	-	-	2001	2850	1422	1820	3300
INDUCTI ON HEATER	Inducto Therm	Inducto Therm	0.850 Kgs.	-	-	Jan. 2006	32	534	-	-
Gas Carburising Furnace	Electricity	Electricity	100 Kg.	-	-	2007	2260	635	632	112
VACUUM EMISSION SPECIHT OMETER	-	FOUNDRY MASTER	1 Kg.	-	-	March 2009	-	-	-	-

Annexure IV

Training Equipment

CAM	Package	Licenses	Vendor	Qty.	Brief Description	Version
SOLID WORKS	1	1	Ideas Design Solution, Ludhiana	12 seats	Manufacturing: 2D &3D , surface & wireframe machining	SOLIDWORKS 2006
PRO E 4.0	1	1	Rolta India Ltd., Mumbai	500 seats	Manufacturing: 2D &3D , surface & wireframe machining	PRO E 4.0
UG 7.0	1	1	Digital Design Solution, Gurgaon	07 seats	Manufacturing: 2D &3D , surface & wireframe machining	UG 7.0
WORK NC 21	1	4	3-D WORKS, Ludhiana	04 seats	Manufacturing: 2D &3D , surface & wireframe machining	WORK NC 21
CATIA V5 R16	1	1	CMS, Delhi	03 seats	Manufacturing: 2D &3D , surface & wireframe machining	CATIA V5 R16
DEL CAM	1	1	DEL CAM Software India Pvt. Ltd, Pune	03 seats	Sketcher, Part Modeling & Editing, Creating Work Plane, Surfacing, Wire Frame & Manufacturing	DEL CAM 7.0
CAD	Package	Licenses	Vendor	Qty.	Brief Description	Version
Auto CAD CADIAN	1	1	Design Tech System Pvt. Ltd, Pune.	Unlimited	Creating, Opening, Editing and Printing objects, Layers, Line Types,Dimensioning, Layout, 2&3-dimensional CAD	AUTO CAD 2006

SOLID WORKS	1	1	Ideas Design Solution, Ludhiana	12 seats	Sketcher, Part Modeling & Editing, Creating Work Plane, Surfacing, Sheetmetal, Mold(core & cavity), Assembly, Drafting & weldment	SOLIDWORKS 2006
PRO E 4.0	1	1	Rolta India Ltd., Mumbai	500 seats	Sketcher, Part Modeling & Editing, Creating Work Plane, Surfacing, Sheetmetal, Mold(core & cavity), Assembly, Drafting & Manufacturing	PRO E 4.0
UG 7.0	1	1	Digital Design Solution, Gurgaon	07 seats	Sketcher, Part Modeling & Editing, Creating Work Plane, Surfacing, Sheetmetal, Mold(core & cavity), Assembly, Surfacing, Sheetmetal, Mold(core & cavity), Assembly, Drafting & Manufacturing	UG 7.0
AUTO DESK INVENTOR	2	1	KADKRAFT, Chandigarh	35 seats	Sketcher, Part Modeling & Editing, Creating Work Plane, Surfacing, Sheetmetal, Assembly, Drafting	AUTO DESK INVENTOR 2011
CATIA V5 R16	1	1	CMS, Delhi	03 seats	Sketcher, Part Modeling & Editing, Creating Work Plane, Surfacing, Wire Frame, Sheet metal, Mold(core & cavity), Assembly, Drafting & Manufacturing	CATIA V5 R16
IDEAS	1	1	Design Tech System PVT. Ltd., Pune.	01 seat	Sketcher, Part Modeling , Creating Work Plane, Surfacing, Sheet metal, Mold(core& cavity), Assembly, Drafting	IDEAS R7
Hydraulic & Pneumatic Lab	Package	Licenses (Description)	Vendor	Qty.	Brief Description	Version
Hydraulic System	1	1	FESTO, Bangalore	1	Design & Simulation of Hydraulic System	Fluidsim H 4.2
Pneumatic System	1	1	FESTO, Bangalore	1	Design & Simulation of Pneumatic System	Fluidsim P 4.2

Annexure V

List of Training Programmes recently attended

- Course on Purchase Management for MSME
- Orientation programme for MSME Tool-Rooms
- Competitiveness through Energy Efficiency
- Purchase Management for MSME
- Results – Frame work Document
- Hydraulic and Pneumatic kits
- Awareness Programme on “Use of Natural Gas in Furnaces ”
- Awareness Training Programme on Environment Legislation
- Training on Forging Simulation software
- Orientation Programme for Design Professionals under Design Clinic Scheme of NMCP
- Seminar on Solid Edge
- Unigraphics – Nastran
- Auto Desk Inventor
- Hydraulic and Pneumatic kits
- Injection Moulding Machine



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Strategic Assessment of MSME Tool Rooms

As Is Assessment Report – IDTR Jamshedpur

Prepared for

**Micro, Small and Medium Enterprises
Umbrella Programme**

giz Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH



Knowledge Partner:



Grant Thornton

Contents

	Page
Abbreviations Used	5
Executive Summary	7
Introduction	9
Chapter I- Organisational Profile	11
Chapter II- Governance, Management Systems and Processes	13
Chapter III- Organisational Assessment	17
Chapter IV- Overview of Local Business Environment from Tool-Room Perspective	33
Chapter V- Inclusive Growth underlined by Social Impact	35
SWOT	37
Conclusion	38
Annexure I- Details of visits	39
Annexure II- Organisational Chart	40
Annexure III- Training Courses	41
Annexure IV- Production Equipment	43

Table 1: Profile.....	11
Table 2: Annual targets	14
Table 3: Service Mix	17
Table 4: Service - Sector Mix	18
Table 5: Sources of revenue.....	19
Table 6: Sector mix of revenue from production of services (Average of 2006-2011).....	19
Table 7: Training Income from various courses	20
Table 8: Spread of products, percentages based on values	23
Table 9: Industry break-up in numbers.....	24
Table 10: Facility break up of IDTR Jamshedpur.....	26
Table 11: Total Equipment Value in Training Department (Net Block) in Rs. lakhs	27
Table 12: Personnel.....	28
Table 13: Retention pattern	28
Table 14: Machine utilisation	30
Table 15: Net worth trend over 5 years	30
Table 16: Government Grants	31
Table 17: Net Worth without Government grants	31
Table 18: Trend of Income and Expenditure	32
Table 19: Backward linkages	34
Figure 1: Revenue mix from production-related services	19
Figure 2: Number of persons trained.....	20
Figure 3: Training income from various courses.....	21
Figure 4: Spread of income: Tooling services	24
Figure 5: Repeat orders.....	25
Figure 6: Geographic spread of the production services supplied	25
Figure 7: Break-up of infrastructure	26
Figure 8: Profitability and Composition	31
Figure 9: Trend Analysis.....	32
Figure 10: Social Spread of Trainees	36
Figure 11: Gender spread	36

Abbreviations Used

AICTE	All India Council of Technical Education
CAGR	Compound Annual Growth Rate
CAD	Computer Aided Design
CNC	Computer Numerical Control
CAM	Computer Aided Manufacturing
D	Dimensional
DANIDA	Danish International Development Agency
DC	Development Commissioner
DG	Diesel Generating
EDM	Electric Discharge Machining
ESPD	Entrepreneurship & Skill Development Programme
FMIS	Financial & Management Information System
FY	Financial Year
GFR	General Financial Regulations
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GOI	Government of India
HOD	Head of Department
HRD	Human Resource Development
HT	Heat Treatment
IDTR	Indo Danish Tool Room
ISO	International Standards Organisation
IT	Information Technology
ITI	Industrial Training Institute
IMTEX	India Metal-cutting Machine Tool Exhibition
IITF	India International Trade Fair
L 1	First Lowest
M/C	Machine
MIS	Management Information System
MoMSME	Ministry of Micro, Small and Medium Enterprises
MSME	Micro, Small and Medium Enterprises
NTTF	Nettur Technical Training Foundation
OEM	Original Equipment Manufacturers
PG	Post Graduate
SOP	Standard Operating Procedure
UNDP	United Nations Development Programme

Executive Summary

Tool-Room is the backbone of the manufacturing industry. To assist MSMEs with infrastructure in tool engineering, the Government of India set up the Indo Danish Tool-Room (IDTR) at Jamshedpur for design and manufacture of tools and training of manpower in employable skills in tool-making and allied trades. It has been operating as Government of India Society under Chairmanship of DC MSME since 1995. During the collaboration period total investment in the project was Rs.85.20 crore of which Government of India, Government of Denmark and State Government of Bihar/ Jharkhand contributed Rs.51.74 crore, and Rs.20.56 crore and Rs.12.90 crore, respectively. State-of- the-art tool production facility is installed at IDTR which includes high-end machine tools like CNC milling and turning machines, CNC wire cut machine, jig boring machine and jig grinding machine. IDTR has employee strength of 72.

IDTR's performance is good in revenue generation. In 2010-11, it has recovered all costs excluding depreciation. Operating income and expenditure (without depreciation) in recent years was as below:

Rs. in lakhs					
Year	2006-07	2007-08	2008-09	2009-10	2010-11
Income	606.14	618.30	725.69	827.90	1010.34 4
Recurring expenditure	479.97	490.88	654.11	684.12	788.11
Income minus expenditure	126.17	127.42	71.57	143.78	222.23

A hard working and motivated team, led by a competent General Manager, at IDTR serves the automobile and auto component industry. In 2010-11, it generated a surplus of Rs.2.22 crore after meeting expenses without depreciation on cash basis. On accrual basis, it recovered full cost including depreciation.

An incentive scheme is in position to motivate employees towards better performance. About four month's salary is likely to be paid as incentive for performance during 2010-11 (subject to ceiling for employees with higher basic pay). Good HR policy is in vogue. Communication channels are maintained at all levels of employees. There is a systematic approach to depute employees for skill and management development programmes.

Machines utilisation, as per industry norm of round the clock working, is 33% considering the hours for which these machines were booked worth jobs. If, on the other hand capacity is calculated on a two-shift basis, as IDTR calculates machines utilisation is 62%.

Training department has fared comparatively better than the tooling division; contributing 70% of the revenue in 2010-11. IDTR trained 5550 personnel in its training programmes in 2010-11. It is providing assistance to MSMEs. In terms of numbers, the share of MSMEs was 80% in 2010-11 and 65% in terms of value. It is also providing consultancy to small scale industries. However, production revenue is only 23% of the total revenue in absolute terms and needs improvement.

IDTR's objectives are to assist MSMEs of the region to enhance their competitiveness by providing them high quality-tools, common facilities in machining, consultancy to increase the quality and productivity of their products and training young men for the industry. It has developed good expertise in the manufacture of components for the auto component industry. Currently, however, there is more emphasis on cost recovery. As a result, priority of the Tool Room is to go in for jobs which give higher revenues rather than hand holding the MSMEs, especially micro and small units.

IDTR being a Government of India Society has to work under the guidelines of the Government. However, there are areas in which the autonomy built into its system is not being effectively used. While the Governing Council has the power to manage the Society, representatives of industry on the Council do not participate effectively, many depute next line officials from their organisations to the meetings of the Council. Similarly, their association in design of training programmes to make them industry-oriented and in making procedures and processes more efficient was not significant.

Some of the key challenges, constraints and solutions are tabulated below:

<u>Division/ function/ process</u>	<u>Challenge/constraints</u>	<u>Key solutions/ ideas</u>
Tooling Production	IDTR's current share of tool production is 22% of the total production related services.	To decide a policy to increase the share of tool design and manufacture of tools and tool parts and fixing targets accordingly.
Management Systems	Data on estimated costs and actual costs is not analysed for future corrective action in case of cost overruns. Post placement tracking of trainees is inadequate, which disallows leveraging ex-trainees who hold important positions in tool planning in the industry.	Design of IT enabled Financial and Management Information System (FMIS) is needed for continual improvement and accountability which can be linked to a suitable reward/ incentive system. Suitable training and capacity building of the staff is necessary alongside. FMIS will also be useful in post placement tracking.
Networking with other Tool- Rooms, institutions and alumni	There is no networking with other Tool-Rooms/ institutions. The Tool-Room, thus, does not leverage the network of its alumni to enhance its tool design and production.	Networking with other Tool-Rooms under DC MSME for knowledge and capacity sharing should be strengthened. Again, IT enabled platform for such networking is essential.
Pricing of services	The machine hour rates were approved by the Governing Council in the year 2008. General Manager is now authorised to increase the same by 5% per year depending upon the market conditions. Users find IDTR prices higher than private tool makers.	Based on a market study, IDTR should give reasonable discounts to MSMEs. DC MSME should examine if discounts allowed could be reimbursed to IDTR like fees of SC/ ST trainees.
Lack of marketing strategy for tooling services	IDTR does not have a marketing strategy for its tooling division based on market assessment, or any study or survey of market needs and market segmentation.	The marketing team should have a strategy which is based on market need assessment and segmentation. Market study needs to be carried out.

Introduction

Background information

To foster the growth of Micro, Small and Medium scale industries, the Government of India set up ten Tool-Rooms across the country with state-of-the-art equipment for design and manufacture of tools and for training of manpower in employable skills. Of these, four were set up with the assistance from the Government of Germany, three with the assistance of the Government of Denmark, two under UNDP and one without any external assistance. These Tool-Rooms are set up as autonomous Government of India societies with DC MSME as the Chairman. Indo-Danish Tool-Room at Jamshedpur is one of the three Tool-Rooms set up under Danish assistance, Tool-Rooms under state Governments being beyond the scope of this study.

The Tool-Rooms have now been operating for about 10 years after the close of the agreements of external assistance. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) is supporting an evaluation study of 10 Tool-Rooms. M/s Grant Thornton Advisory Private Limited has been retained as Consultants to carry out the Study. Tool-Rooms under the State Governments are outside the scope of this Study.

Terms of reference

The consultant team has been tasked to analyse the existing strengths and weaknesses of the ten Tool- Rooms in terms of their management, finances, human resources, technology and infrastructure as part of the assessment of Tool-Rooms that includes the following:

- institutional / organisational development study of the scheme consisting of political economy aspects involving actors, financial flows, management systems and inter-agency issues stakeholder feedback on existing Tool-Room services from MSMEs and relevant business associations
- stakeholder feedback on further requirements from Tool-Rooms by MSMEs and relevant business associations
- training needs of Tool-Room personnel
- comparison of services with similar private sector and German facilities
- best practices from comparable national institutions such as the Nettur Technical Training Foundation (NTTF), Bengaluru (NTTF is a private educational trust established with Swiss assistance)

Methodology

Data has been collected through secondary research, publicly available information on MSME Tool-Rooms and through a structured questionnaire filled by the respective Tool- Rooms. Facility of the Tool-Room was visited and a series of meetings and discussions took place with senior and middle

management, local associations, suppliers, users and non-user MSMEs and large clients for qualitative assessment¹.

Based on the quantitative information and qualitative assessment, functioning of Tool-Room has been assessed and analysed to provide actionable recommendations for improving alignment of Tool-Room services to the strategic goals through optimum mix of different services and delivery approach, increased revenue, outreach and impact, organisational procedures and governance mechanism, technological and human resource development need, enhanced networking etc. Recommendations shall be accompanied by a time-bound and cost estimated action plan for the DC MSME for implementation. Cost estimates would refer to requirements of additional machinery or equipment, general infrastructure, staff restructuring and training etc., that would be needed to implement the recommendations. In addition, an institutional analysis framework that can be used by DC MSME in future will also be developed.

However, this report is limited to 'AS IS' assessment, and the analysis of functioning of Tool-Room and recommendations are part of a separate report.

Structure of the report

Given below is a summary of how the report has been structured:

Chapter I – Organisation Profile: A brief description of IDTR Jamshedpur.

Chapter II – Governance and Management Systems: This chapter assesses the autonomy of the Tool-Room and its Chief Executive, the General Manager, guidelines followed by the Tool-Room defined by the Ministry of MSME and the level of interaction between DC MSME and the Tool-Room.

Chapter III – Organisational Assessment: This chapter assesses the current status of service portfolio, technological infrastructure, marketing strategy, finance, management systems, human resources and its impacts against the stated policy goals.

Chapter IV – Overview of Local Business Environment from Tool- Room perspective: This chapter assesses the location of the Tool-Room and the market potential for it to expand its services. It also analyses the availability of raw material and machinery suppliers in the region.

Chapter V – Inclusive Growth underlined by Social Impact: This chapter analyses the impact of IDTR in all the three areas of training, tooling and dissemination of environment-friendly technologies to MSMEs.

¹ Complete list of meetings and interviews is placed at Annexure I.

Chapter I

Organisational Profile

IDTR works as a central autonomous body under the administrative control of the Ministry of MSME, Government of India. The management of affairs of the Tool-Room rests with the Governing Council constituted by the Government of India. The Additional Secretary and the Development Commissioner (MSME), Government of India, is the Chairman of the Governing Council.

IDTR Jamshedpur

Table 1: Profile

1.	Project Background	Indo Danish Tool Room, (IDTR), Jamshedpur, a Government of India project, established under bilateral agreement with Government of Denmark and assistance from the State Government (Bihar/ Jharkhand), is a centre of excellence for tooling and provides complete tooling solutions. It started operations in 1991.			
2.	External Aid Agency	Government of Denmark, Danish International Development Agency (DANIDA)			
3.	Project Cost	Rs.85.20 crore (up to period of collaboration with DANIDA)			
4.	Funding Pattern (figures in Rs. Crore)	GoI	Aid Agency	Others(State)	Total
		51.74	20.56	12.90	85.20
5.	Organisation Structure ²	Government of India Society – an autonomous body under MoMSME, DC MSME			
6.	Objectives	- To provide consultancy services primarily to small scale units in the field of Tool Engineering aimed at improving the productivity of the small scale units. - To provide common facility services in precision machining/ heat treatment and other technical engineering know-how on tooling to the small scale industries in the country. - To impart short-term and long-term training to the youngsters in the field of tool & die-making course with latest technologies. Tool-Room can provide above services to large-scale			

² Organisation chart is placed at Annexure II

		industries to extent such services are necessary to cover costs incurred for its services.
7.	Technology	Following technologies are available at IDTR for tooling, production, training etc: • The production facilities include machines like CNC controlled milling machines, CNC wire cut machine, CNC turning centre, injection moulding machine • Profile grinding, precision grinding, cylindrical grinding and jig grinding machines. • Other production facilities include- Heat Treatment facilities viz. Vacuum Heat Treatment Plant
8.	Training Programmes	a. Long-term courses (One year or more duration) • Four years Diploma in Tool & Die Making • Three courses each with duration of 2 years in Tool-Room machining, advanced machinist, Tool-Room fitter, respectively • Two Post Diploma courses of one-year duration in tool design and CAD/ CAM • A condensed course in tool and die-making of one-year duration b. Short-term courses • Courses in CAD/ CAM, Tool Design & Manufacturing, CNC Programming & Practices, Advance Machine Maintenance, and welding technology, Quality Control. The duration of these courses is 6 months. • Courses in automation with hydraulics and pneumatics, CNC Commissioning and Maintenance, Advance PLC Programming & SCADA, CAD/ CAM/ CAE, networking, industrial safety, theory & design of press tools, die casting, plastic moulds and jigs and fixtures. (duration of short-term courses varies from 2 weeks to 6 months)

Chapter II

Governance, Management Systems and Processes

This chapter assesses the autonomy given to the local management, procedures followed by the Tool-Room defined by the Ministry of MSME and the level of interaction between DC MSME and the Tool-Room. This also assesses the role of GC in the overall functioning of the Tool-Room. This is to analyse how all these factors are contributing or hindering the performance of IDTR Jamshedpur.

Policy goals and direction

The aim of setting up the project is to assist the industry, primarily small scale industries and strive for self sustainability. However, lately emphasis has been more on self sustainability on financial account. Targets are fixed for both training and production revenue. Target is also fixed for number of persons trained in short- and long-term courses. The DC MSME monitors the project with reference to these targets. No targets have been fixed for the number of MSMEs and value of assistance to them. Parameters to be tracked could be value of tools and other assistance rendered, increase in productivity, decrease in rejection percentage, saving in costs etc., on account of the consultancy provided to the MSME industrial units. Inclusive growth and impact are not monitored.

As a result of direction to financial recoveries, stress is now more on activities which generate more revenue like training courses and specifically short-term courses. In 2010-11, of the total revenue of Rs.1104.65, training generated 70%. Only 23 % revenue came from production-related activities. IDTR's revenue recovered costs without depreciation but was marginally short of recovery with depreciation. On accrual basis, IDTR recovered expenditure including depreciation.

Core Management Team

IDTR has a motivated management team. Important departments, like production, training and administration are headed by Senior Managers. Marketing and Consultancy is headed by a Manager. All department heads exercise good command. An incentive scheme is in place which motivates all employees for better performance. All employees are deputed for development programmes, and the HRD takes care of career progress of its employees.

Annual Targets

There is no formal need assessment undertaken to estimate the market opportunity for its services. Each year annual revenue targets are fixed for training and production which are not linked to the market opportunity or desired level of impact. Physical targets are fixed for training, both for long-term and short-term courses. However, there are no targets with respect to the number, quality and

value of assistance to MSMEs. Table 2 gives the details of the targets achieved by the IDTR in the year 2010-11.

Table 2: Annual targets

Service	Target	Achievement	Achievement %
Training (Physical)	3700 persons	5550 persons	150%
Training Revenue	Rs.550.00 lakhs	Rs.622.84 lakhs	113%
Production Revenue	Rs.320.00 lakhs	Rs. 302.12 lakhs	94%
Other Revenue	Rs.30.00 lakhs	Rs.85.38 lakhs	285%
Total Revenue	Rs.900.00 lakhs	Rs.1010.34 lakhs	112%

Source: Annual performance of IDTR, Jamshedpur

Management system

The IDTR is ISO 9001-2008 certified organisation for the following standards.

There are Standard Operating Procedures (SOPs) which are documented and followed at the IDTR:

- Customer inquiry, clarification and review
- Design and development
- Design of training courses and evaluation
- Estimation of price of products and services
- Order processing
- Quality assurance
- Performance (trial) of tools
- Inspection report for the raw materials purchased
- Calibration control card for instruments
- Rejection report
- Customer satisfaction
- Preventive maintenance

The Tool-Room has upgraded its ERP system by introducing SAP-B1 implemented live in April, 2007 and since then the new ERP system has become functional. The SAP-B1 has lot of additional features which include add-on facilities for the training department pertaining to various training courses being conducted by the training department. The SAP training was imparted to all the end-users and the existing ERP system is being modified by adding some more features as per the requirement of the Tool-Room management system.

Procurement system

For procurement the Tool-Room needs to follow the General Financial Rules (GFR) calling for quotations and decision making guided by L 1 principle due to which suppliers tend to quote lower rates, sometimes compromising on quality. Raw material procurement procedures take 2 to 4 weeks which could lead to delay in deliveries, which run parallel when tool is to be designed. By prompt action and careful drawing of specifications, IDTR is able to overcome these difficulties.

For capital goods, an action plan with details of equipment and related costs is prepared in consultation with local GC members and submitted to DC MSME at the beginning of FY for consultation with Integrated Finance Wing of the MoMSME. It is then ratified by the Governing Council. However, the Integrated Finance Wing of MoMSME can still raise objection to release funds although it was concurred in by them before. Procedure needs to be simplified and objection must not be made by the Wing at the advanced stage. Since capital goods are also procured on least-

cost basis, two bid systems should be used. It may be advisable to seek performance bank guarantee from the supplier for a limited period to ensure desired performance of plant and machinery.

Development of a procurement manual covering the operational details on above suggestions would be beneficial to improve efficiency and effectiveness of procurement.

Networking with other Tool-Rooms, institutions and alumni

The IDTR can significantly improve networking with alumni which can lead to more business and placements. The training initiative can be scaled up through networking with institutions having infrastructure available with them e.g. ITIs, Polytechnics, state government Tool-Rooms/institutions, etc. Networking with other Tool-Rooms under MoMSME would also be useful for knowledge and capacity sharing. It should be done at HOD level in addition to General Manager's level. Again, IT enabled platform for such networking is essential.

Interaction with DC MSME

DC MSME monitors the performance of Tool-Room. A system is in place under which Tool-Room submits the following reports:

- Performance report is submitted monthly. Against annual targets, following information is submitted for the month and cumulative during the year up to the month of the report.

Reports on revenue, expenditure, order position, delivery status, machine utilisation, number of trainees and number of MSMEs assisted are submitted. Tool-Room is required to explain the shortfalls, if any.

- System brings out cost recoveries but not the impact and outreach to MSMEs. Instead of monitoring numbers it should bring out the value of assistance provided to MSMEs and highlights of five technology-related assistance cases. System should also be evolved to monitor customer and trainee feedbacks on courses conducted.
- Report on annual action plan containing targets and funds needed during the year for recurring and non-recurring expenditure is also submitted. It is prepared in consultation with local members and submitted to DC MSME who approves the same in consultation with Integrated Finance Wing of the Ministry. It is then put to Governing Council for ratification. Role of Governing Council is limited to local members who are consulted. Ratification is a formality.
- Report on monthly status of court cases in which DC MSME is respondent is also submitted
- Submission of annual report which includes audited annual accounts for placement before the Parliament.
- Information on innovative work done. This is used for the preparation of Cabinet Note on performance of MoMSME.
- Report submission on annual manpower status.

Decision making

Management of the Tool-Room is with the Governing Council. However, it meets once in a year, on an average, when convened to pass Annual Accounts and the Annual Report and generally away from the Tool-Room premises. Also, representatives of industry are not found to be taking interest

in decision making and it is generally the officials from MoMSME and the State Government who deliberate in the meetings. Some of the representatives, on the Council, from industry depute their juniors for the meetings which dilutes their contribution. Members other than officials are volunteers. It is needed that the structure is revised in favour of greater percentage of independent members with no business relation with Tool-Room e.g. representatives from universities and technology leaders. They should be paid honorarium for their services.

While expectations from IDTR are now similar to those from a private commercial tool-room; CITD does not enjoy a similar level of independence. Despite this, CITD has, on cash basis, recovered cost without depreciation. It falls short marginally on cash basis with depreciation. On accrual basis it recovers full costs including depreciation. Considering the Tool Room is performing so well within the current constraints of Govt. Regulations; it could perform even more efficiently if vested with the freedom in decision-making like private tool rooms.

Chapter III

Organisational Assessment

This chapter assesses the current status of service portfolio, technological infrastructure, marketing strategy, finance, management systems, human resources and their impacts against the stated policy goals. This chapter also analyses different factors that either contribute or hinder the performance of IDTR Jamshedpur in achieving its stated objective.

Overview of services

Table 3: Service Mix

Production		
Tool-related services	Job work	Training ³
- Design of Moulds, Press Tools, Jigs & Fixtures, Gauges, Die Casting Dies, Extrusion Dies & Forging Dies etc. - Manufacture of Moulds, Press Tools, Jigs & Fixtures, Gauges, Die Casting Dies, Extrusion Dies & Forging Dies etc. - Testing tools - Repair of tools - Manufacture of tool parts - Inspection of tools parts	- Computerized SAP-B1 system has facilitated in the production by balancing it in different workstation capacities. - Machining of precision equipment - Jobbing work and components production - Pilot production after testing of tools - Production with latest technologies like CNC, CAM & inspection by Co-ordinate Measuring Machine. - Manufacture of automobile parts, telecommunication components, steel plant and rolling mills components etc - High quality distortion free heat treatment by vacuum furnace - Inspection of parts/ components	Long-term courses (One year or more duration) - Four-Year Diploma Course in Tool & Die Making. This course is approved by All India Council for Technical Education (AICTE), Delhi. - Two-Year Machinist/ Fitter course approved by NCVT, Govt. of India. - Two years Advance Machinist course especially for ST/ SC/ OBC/ Minority sponsored by Dept. . of Welfare, Government of Jharkhand - The Tool-Room offers courses, with duration of 2 years, like Advance Machinist Course with its own certification Short-term courses (3 months to 1 year)

³ List of training courses conducted by IDTR is in Annexure III.

		- The Tool-Room offers courses in CAD/ CAM, Tool Design & Manufacturing, CNC Programming & Practices, Advance Machine Maintenance, and welding technology and Quality Control. The duration of the above mentioned courses varies from 6 months to 1 year. Short-term courses (Less-than-three months) - Various short-term training courses such as Automation with Hydraulics and Pneumatics, CNC Commissioning and Maintenance , Advance PLC Programming & SCADA - The other short-term courses are Theory & Design of Press Tool, Die Casting, Plastic Mould and Jigs and Mixture.
In addition to the above, IDTR also provides Consultancy for Component Machining Process, Metrology and Inspection, Laser Calibration, Vacuum Heat Treatment, Manpower up-gradation and Project establishment.		

The service sector matrix below indicates the service utilisation by respective sectors:

Table 4: Service - Sector Mix

Type of tools/ services	Industry Cluster		
	Plastic	Auto Components	Others
Heat Treatment		√	
Moulds	√	√	
Dies		√	
Gauges, Jigs fixtures		√	√
Job work		√	√
RP		√	
Others		√	

While the above is the status with respect to the services and markets served by the IDTR, there is no formal need assessment undertaken to estimate the market opportunity for its services. Each year, annual targets are fixed for training and production which are not linked to the market

opportunity or desired level of impact. Linking these two parameters will be an advantage in marketing and expanding its services.

Contribution

The break-up of revenue contribution from various services in 2010-11 and break up of revenue (cash basis) from production-related services are given in the Table 5 and Table 6, respectively.

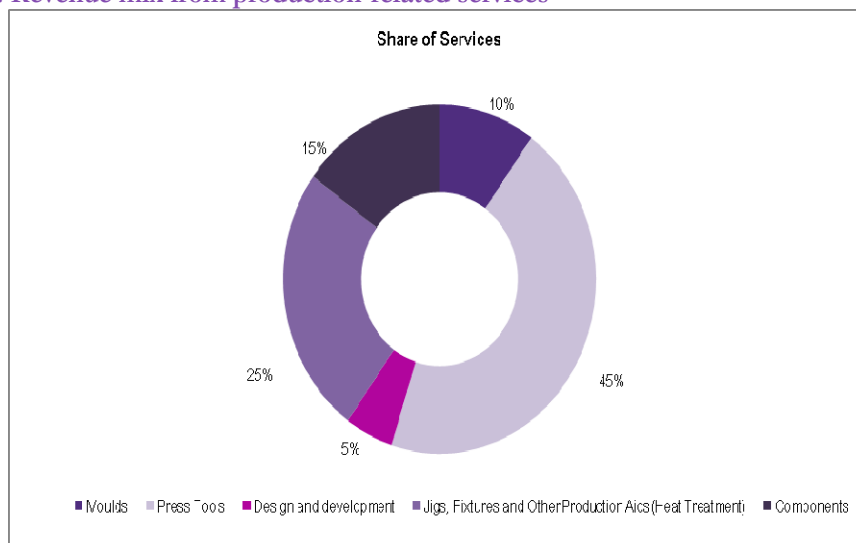
Table 5: Sources of revenue

Activity	Revenue in Rs. In lakhs
Production related services	257.61
Training programmes	773.89
Others (interest etc)	73.15
Total	1104.65

Table 6: Sector mix of revenue from production of services (Average of 2006-2011)

Production Service	Percentage of Income
Moulds for plastics	10 %
Press tools	45 %
Design and development	5%
Jigs, fixtures and other production aids (Heat Treatment)	25%
Components	15 %

Figure 1: Revenue mix from production-related services



The maximum revenue is generated from training, which, in 2010-11, has contributed 70% of the total revenue realisation. In production, average of last 5 years is 45% from press tools, 25% from jigs, fixtures and other production equipments, 10% from moulds, and 5% from design and development. Revenue from training has been rising; it rose from 41% in 2005-06 to 65% in FY 2010-11. During the last five years, the industry feedback has been very positive. IDTR graduates are considered to have better practical skills as compared to graduates from ITIs or even engineering colleges.

Training

The IDTR Jamshedpur enjoys strong reputation in training with high demand for its training courses. In 2010-2011, the IDTR trained 5550 persons, with 796 trainees in long-term training courses and 4754 trainees in short-term training programmes. Trend from 2006-07 to 2010-2011 is given in Figure 2.

Figure 2: Number of persons trained



Trainees in short-term courses have increased as a proportion of total number of trainees, from 72% in 2006-07 to 86% in 2010-11. Trainees in short-term courses have upped more than in long-term courses. There has been mushrooming in engineering education and engineers passing out of engineering institutes. Graduate engineers and diploma holders use short-term training programmes to have practical knowledge. The trainees for short duration programmes are primarily those already working in the industry and students from engineering colleges, ITIs or polytechnics who undergo these training courses.

The students for both the short- and long-term courses (include condensed courses) are admitted from all over the country but majority (80%) come from within the region.

There is tremendous scope to increase employment linked training programmes given the demand from the industry and potential to leverage available infrastructure, polytechnics and engineering colleges in the region. IDTR is already running two extension centres- one at Patna (TRTC) and another one at Raipur (CAD/ CAM centre). In 2009-10, TRTC Patna trained 267 trainees and CAD/ CAM Centre trained 56 trainees.

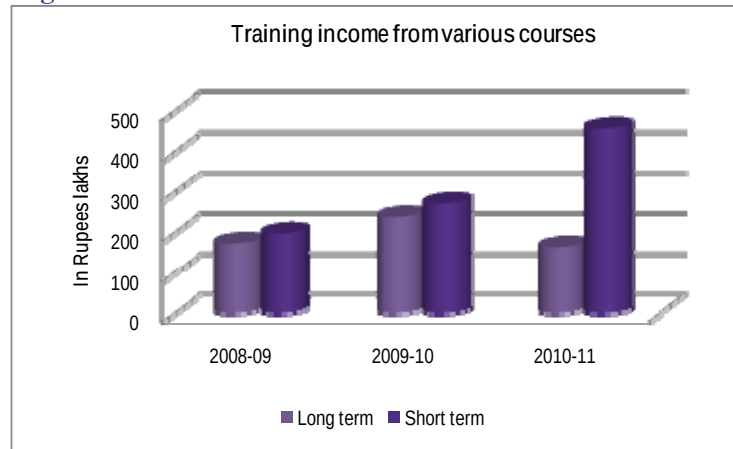
Training income

Given below is a break-up of the training income (accrual basis) received from long-term and short-term courses over a period of last three years.

Table 7: Training Income from various courses

Training Courses	2008-09	2009-10	2010-11
Long Term Courses	173.97	238.16	165.13
Short Term Courses	198.41	271.25	457.72

Figure 3: Training income from various courses



Income from short-term courses has increased from 35% in 2006-07 to 73% in 2010-11 as a percentage of total training income.

Fee waiver

There are no scholarships provided to the students of IDTR. However, fee for SC/ ST candidates is reimbursed by the Central Government and the Government of Jharkhand reimburses fee for SC/ ST/ OBC/ Minority candidates. The details of the sponsored courses are given below:

- Two-years Advanced Machinist Course for ST/ SC/ OBC/ Minority sponsored by Department of Welfare, Government Of Jharkhand in which students from Jharkhand are trained.
- Two- years Advanced Machinist Course, sponsored by DONER in which candidates from North East are trained.

Placement and Tracking

IDTR has a Placement Cell which arranges placement through campus interviews. For courses with duration of two- years & above, the cell offers 100% placement. Post placement tracking needs to be improved.

Pricing of Services

The pricing for any tooling job and production is based on the following formula:

$$\text{Cost} = \sum [\text{Machine hour rates} \times \text{Number of hours on the machines}]$$

The Machine hour rates are fixed taking into account the following components:

- Depreciation
- Direct Cost
- In-direct Cost
- Overheads
- Opportunity Cost

For the pricing of tooling services, cost plus method is used, whereas for production services and consulting costing is market determined. For determining the market rate, private commercial tool room is the benchmark. It takes 1 to 3 days to quote for an average tool. Delivery time ranges from

4 to 12 weeks. The Tool-Room does not employ a professionally qualified cost accountant or a person having prior experience in Cost management in a similar sector.

Training

Cost of training leading to Diploma in Tool and Die Making works out to Rs.55000/- per annum per trainee. Trainees are charged Rs.30000/- per annum for subsidised courses. For other long-term courses fee is determined on cost plus basis. The expense heads considered for estimating the long-term course fee are salaries and other allowances, office material cost, raw material cost, electricity cost, maintenance and repair cost.

Course content for long-term and short-term programmes is developed based on:

- expectations of the industries/ participants
- feedback from the industries of the previous courses
- latest developments on the subject regarding technological up-gradation
- theory constitutes 40% of the course curriculum and practical workshop on job training constitutes remaining 60%

The long –term courses are certified by AICTE and National Council for Vocational Training (NCVT).

For MSMEs, Tool-Room has carried out specially designed training programmes in programming and operation of CNC Lathe, AutoCAD, Automation using PLC, CMM operation, Tool Theory and design etc. Special training programmes have also been conducted for industries/ Government agencies in the last five years. Details of these programmes are given below:

- Two-years Advanced Machinist Course for Government of Jharkhand, Department of Welfare
- Six-month Skill Development programme for the unemployed youth under CSR activity for corporate
- One-year Condense Tool & Die Making for District Administration under IAP
- Six-month Tool & Die Making course for District Administration under IAP
- Six-month Inspection & Quality Control course for District Administration under IAP
- Six-month CNC Technology & Operation course for Ministry of DONER for North-East Region
- Six month Post Diploma course in CAD/ CAM for Ministry of DONER for North-East Region

Marketing System

The IDTR has a separate Consultancy and Marketing Department. Training courses are marketed by the training department. Each team is given annual targets which are approved by the Governing Council and DC MSME. Monthly progress review is carried out by the General Manager and DC MSME

Strategy

One-on-one meetings are held with representatives of users at IDTR and also through visits to regular and prospective customers. Tooling requirements are discussed in detail and after all technical clarifications, prices are quoted and commercial clarifications given, if needed. An advance of 40% is taken with the order as security since tools are customer specific. Other means of marketing are:

- participation in exhibitions
- presentations in meetings of associations of industry

- presentations in seminars
- insertions in newspapers
- mail
- online through website⁴

The marketing department has developed new customers in the automobile & engineering sector.

Constraints

Organised and systematic need assessment of the market available to IDTR and its segmentation has not been done. Such a study needs to be done to provide leverage to IDTR in marketing.

Client profile

The IDTR at Jamshedpur has the strategic advantage of being in the midst of concentration of industries which are heavy users of tools, moulds and dies. It is presently catering to automobile, auto components, telecom, plastic, electronics, light engineering, forging, foundry, defence and research and development industries. All of these sectors have witnessed significant growth in the past few years and the trend is likely to continue e.g. auto component sector had a CAGR of 21%, plastics 12 % and home appliances grew at 14%. Since the tooling demand grows in the same proportion, these sectors provide a significant market opportunity.

60% of ITDR clientele in terms of value is automobiles and auto component industry. Main auto component cluster that IDTR is serving is Adityapur Auto Cluster. This cluster covers the geographical area of the Jamshedpur city and Adityapur industrial area, with the manufacturing units of Tata motors located at Jamshedpur. There are 852 industrial units, of which 771 are small and micro enterprises. About 70-80% of the companies manufacture auto components directly/indirectly for the OEM. Most of the industries have conventional machine tools, some have upgraded to advanced CNC technology machine tools (CNC lathes and machining centres). The necessary training for this is imparted at IDTR. Automobile giant, Tata Motors, have two Tool-Rooms, one at Pune and the other at Jamshedpur. These two cater to the tooling needs of all plants of Tata Motors from their own production or by outsourcing. IDTR has good linkage with the Tool-Room at Jamshedpur which is an advantage, both for marketing and for keeping track of developments in the field. Tata Motors are important users of services of the Tool-Room.

IDTR has also developed expertise in the manufacture of telecom components which are of very high precision. It has developed specialisation in sheet metal tools. It is serving steel plants.

Table 8: Spread of products, percentages based on values

Products Spread	2006-07	2007-08	2008-09	2009-10	2010-11
Moulds for plastics, metal	20%	30%	10%	10%	10%
Press tools	30%	30%	45%	40%	40%
Components	10%	10%	10%	10%	10%
Jigs, fixtures	10%	5%	10%	10%	10%
Forging dies	5%	5%	10%	10%	10%
Forging dies, foundry patterns	5%	5%		5%	5%
RP, design, product dev	10%	5%	5%	5%	5%
Others (heat	10%	10%	10%	10%	10%

⁴ <http://idtrjamshedpur.com>

treatment)					

Types of industries served – MSMEs assisted

The share of MSME customers in number has slightly decreased from 82% to 80 % over the past 5 years. However, in terms of value, MSME share has increased from 60% to 65% in the same period. IDTR has achieved financial sustainability (excluding depreciation) from 2006-07 to 2010-11 even when most of the clients are from MSME segment. IDTR also provides consultancy to small scale industries to improve their productivity.

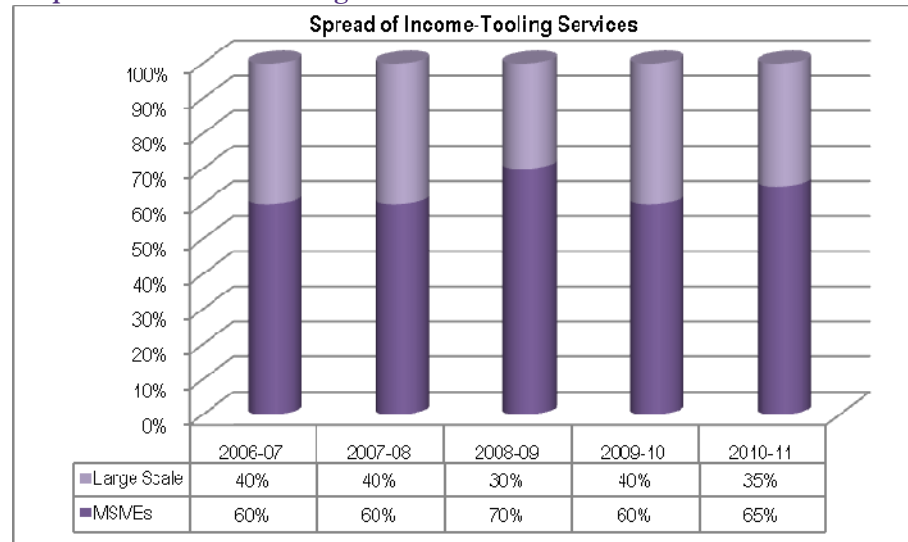
The table below provides a trend of share of MSME customers to total customers, in terms of numbers.

Table 9: Industry break-up in numbers

Type of Industry	2006-07	2007-08	2008-09	2009-10	2010-11
MSMEs	180	190	200	210	240
Others/ large units	40	40	40	50	60
Total	220	230	240	260	300
MSME percentage	81.82%	82.61%	83.33%	80.77%	80.00%

The share of MSMEs and large enterprises in IDTR revenues is indicated in the bar chart in Figure 4.

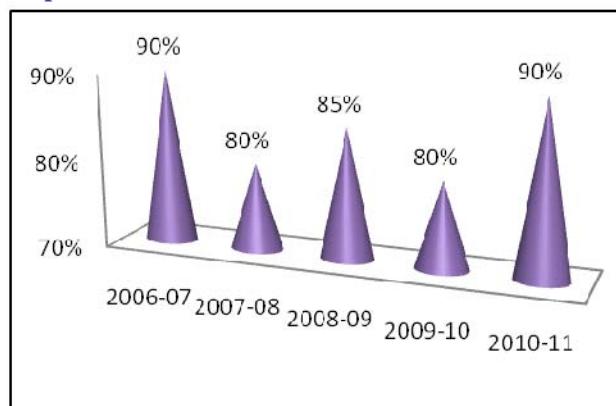
Figure 4: Spread of income: Tooling services



Proportion of repeat orders

IDTR scores well on customer satisfaction and retention. During the last 5 years more than 80% of IDTR's customers have been repeat customers, the percentage rose to 90 % in 2010-11 as reflected in Figure 5.

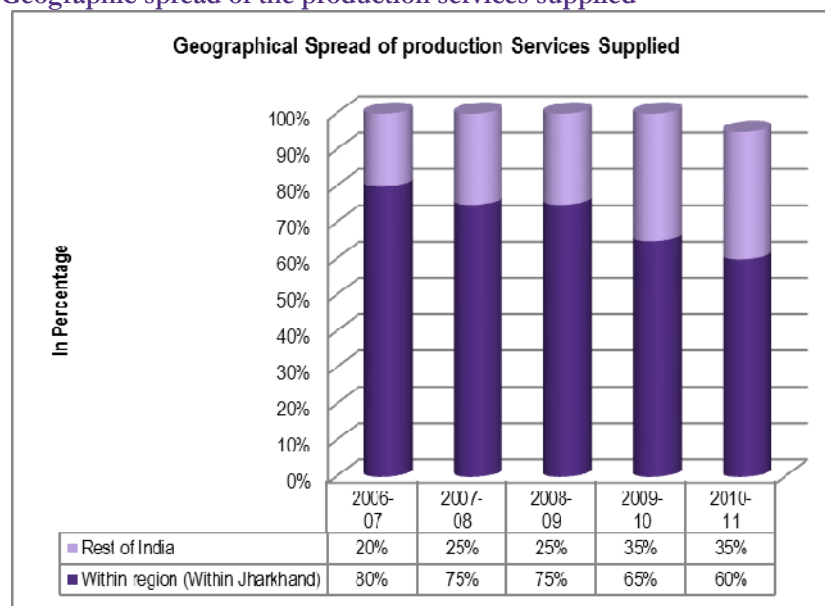
Figure 5: Repeat orders



Geographic spread of the clients for tooling services

As indicated in the chart below, while majority of the customers for production-related services are from within the region in 2010-11, 35% of the industries from rest of India formed a reasonable share. Pattern is reflected in Figure 6.

Figure 6: Geographic spread of the production services supplied



Physical and Technical Infrastructure

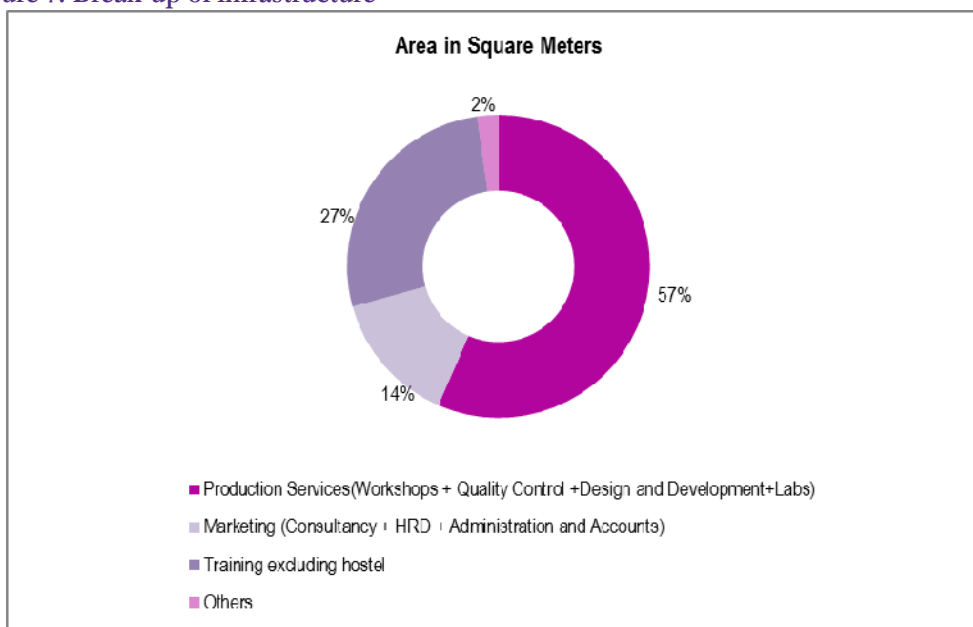
Physical Infrastructure

The IDTR is a well-equipped public commercial Tool-Room. It is located in the industrial area in Jamshedpur. The total built up area of IDTR is 17365 square metres. The built up areas for the various departments is given in Table 10.

Table 10: Facility break up of IDTR Jamshedpur

Facility	Area in Square Meters
Production Services(Workshops + Quality Control + Design and Development +Lab)	8685.00
Marketing(Consultancy + HRD + Admin and Accounts)	2180.00
Training excluding hostel	4150.00
Hostel	2000.00
Others	350.00
Total	17365

Figure 7: Break-up of infrastructure



Utilities

IDTR is supplied power by Jharkhand State Electricity Board. It steps it down and distributes it through its own electrical sub-station. All high-precision machines are in the air conditioned machine enclosures. Besides this, IDTR has its own pumping system and water tanks for water supply system. The Institute has power back up DG sets which can feed all the critical equipment in case of power cut by JSEB. It depends on outside supplies for welding gases and nitrogen for the Vacuum Heat Treatment and other utilities.

Equipment in production-related services sections

Under Indo-Danish Technical Co-operation Programme, IDTR was equipped with high-tech equipment needed at that time. Subsequently, the Plant and Machinery has been augmented and upgraded from time-to-time in Production Department. List of high-technology machines in Production Department is given in Annexure IV.

Appropriateness of technology

The available equipment at IDTR has the capacity to meet present majority demands with respect to accuracy, complexity and physical size of tools. It has high-end hardware and software for CAD/ CAM/ CAE.

Discussions with representatives of tools and gauge manufacturers and representatives of industry using the facilities at IDTR indicate that with manufacturing industry growing at fast rates, particularly the automobile and auto component industry, demand for more accurate tooling involving more complex shapes and faster deliveries (due to frequent change of models) is growing. At present, CNC metal cutting operations in milling and turning are limited to 3 axis. In view of the likely requirements in future, IDTR should needs to upgrade its infrastructure and have equipment capable of 5-axis machining and high-speed milling.

Design development

The design department plays an important role in the success of a Tool-Room. Its services include product design and tool design before the tools are taken up for production. Design office at IDTR is well manned and well equipped. It has engineers trained in use of high-end software in the field of tooling. Softwares include:

- CAD: IDEAS, AutoCAD, UNIGRAPHICS, MOLDFLO NX-4, with which it can offer design solutions needed by the industry it is serving
- CAM: Master CAM, UNIGRAPHICS, Controls of CNC machines are versatile to handle part programming of components
- SIMULATION SOFTWARE for sheet metal

The Tool-Room is using simulation software to check design parameters which, to a large extent, reduces after manufacture design problems, improves the percentage of successful tools with less number of trials and thus saves expensive labour which would be otherwise spent on rework or remake of rejected or defective parts.

Given the nature of MSMEs, this is a major area of strength of IDTR. The MSMEs typically come with the component expecting the Tool-Room to prepare the tool design to produce that component. Without design skills it is difficult to service MSMEs which are significant in number.

Equipment in the training department

Training Department is again well equipped. Equipment includes conventional machines as well as CNC machines of a general engineering workshop. The department also has typical Tool-Room equipment like:

- CNC Milling Machine
- CNC Lathe
- CAD/CAM hardware and software

Table 11: Total Equipment Value in Training Department (Net Block) in Rs. lakhs

31.3.2006	31.3.2007	31.3.2008	31.3.2009	31.3.2010	31.3.2011
486.89	290.90	277.92	405.47	259.63	137.45

Human Resources

In addition to the General Manager, who is the Chief Executive, IDTR has strength of 72 as tabulated below:

Table 12: Personnel

Department / Designation	Senior Manager	Manager	Senior Engineer/ Sr. Accounts Officer	Engineer/ Assistant Admin officer/ Accountant	Craftsmen /Foremen/ Technicians Grade I & II	Others
Administration	1			1		5
Marketing		1		1		
Accounts			1	1		
Production	1	4	3	9	35	
Training	1	2	2			
Planning			1			
Maintenance			1			
Sub Total	3	7	8	12	35	5
Total	70 (72 including General Manager & Deputy General Manager)					

Manpower mix at IDTR is quite appropriate both with regards to numbers and the levels. IDTR also employs operators on contract as and when needed, and at levels needed, which is cheaper as it costs Rs.6,000/- to Rs.10,000/- per month against Rs.20,000/- to Rs.35,000/- which IDTR may have to pay in case of regular employees. It also provides flexibility to management. Trainees are also engaged in production-related jobs which contribute to keeping manpower costs low and giving hands-on practice to the trainees.

There are 46 vacant posts, out of which 20 are since inception (1992). Management has adopted an excellent policy to recruit personnel on need basis. Extra posts were not surrendered due to procedural reasons. It is easier to surrender existing post but it is extremely difficult, and involves a long procedure to get any new post sanctioned.

Skill up-gradation/capacity building need

IDTR deputs its employees for skill and knowledge development programmes which are conducted both in-house and outside. In addition to exposure to latest techniques it motivates the employees to perform better.

Retention

The retention pattern is reflected in the table given below:

Table 13: Retention pattern

Number of years at IDTR	More than 15, up to 20	More than 10, up to 15	More than 5, up to 10	Upto 5
Total Number of employees	14	9	5	44

The retention reflected above is because of good HRD policies at IDTR.

Incentive scheme

Tool-Rooms under DC MSME have been allowed to adopt incentive schemes based on the overall guidelines and limits decided centrally by DC MSME. The scheme lays stress on increasing generation of surplus of income over expenditure, 25% of which is allowed to be distributed to employees based on the following factors:

- Basic Pay + Grade Pay + Dearness Allowance subject to maximum ceiling on basic pay of Rs.8560/- ; those with basic pay of more than Rs.8560/- are paid incentive based on Rs.8560/- basic pay (revised after implementation of 6th Pay Commission Recommendations)
- Number of days of attendance in the financial year over the Tool-Room working days
- There is a maximum ceiling on payment of four months of Basic Pay + Grade Pay + Dearness Allowance subject to maximum ceiling on basic pay of Rs.8560/-
- Contractual employees are also paid incentive based on the number of days they have worked and their wages

Incentive scheme has motivated all sections of employees which is the force behind improvement in output at IDTR. For the year 2009-10, employees were paid three month's salary as incentive, subject to ceiling as mentioned above. For 2010-11, they are likely to be paid four months' salary. All employees are covered by the scheme, which is a group incentive. Tool- Room work is non-repetitive, hence routing and scheduling differs with every tool part. Ceiling on the amount of incentive payable even after earning more should be removed. Individual incentive scheme is rather difficult and IDTR has adopted the right approach in this regard. Individual incentive scheme can be considered at a later stage when MIS system is developed to the extent that standard machining times can be generated with the help of softwares.

Operational efficiency

Lead time and quality

IDTR Jamshedpur is known for the quality of its tooling work. Lead times are also acceptable to the industry. They, however, find the price level high particularly for micro and small units. No discount is allowed to MSMEs.

Mechanism adopted for calculating lead time

For repeated jobs	CAM m/c jobs	New jobs
Taken from previous lead time data	From CAM software data	Based on experience

Average lead time

Simple jobbing work	Medium complex jobbing work	Critical jobbing work	Simple tools	Medium complex tools	Critical tools
4-5 days	2-3 weeks	3-4 weeks	1 week	4 -6 weeks	8-10 weeks

Machine utilisation

Utilisation data for 15 critical machines at IDTR in production-related services was examined. The analysis indicates that there is a significant scope for improvement. Ideally, critical machines should be used round the clock. Since Tool-Room operations are non-repetitive and all tool parts need

different routing and scheduling, the utilisation target could be 85%. IDTR's position with regard to utilisation of 15 critical machines is given in Table 14.

Table 14: Machine utilisation

A	Number of hours, per annum, available on 24 hours basis, 296* days	106560
B	Number of hours, per annum as per IDTR shift m/c engagement, 290 days	56840
C	Hours booked for jobs	35417
D	Hours taken by operators on jobs	42725
E	Utilisation of capacity on 24 hours basis, 296 days, for jobs booked C/A	33%
F	Utilisation of capacity on 24 hours basis, 296 days, hours taken by operators D/A	40%
G	Excess machining cost over the estimated cost, machining costs (D-C)/ C	20%
H	Utilisation of capacity as per IDTR shift engagement of machines C/B	62%

*365 – 52 Sundays – 17 holidays

**Working days considered by IDTR

Machine utilisation is on the lower side and needs to be improved. About 18,175 hours, amounting to 25% of capacity, even as per IDTR assumptions, are spent on rework, maintenance, no load or are otherwise not used for productive work

Improvement of capacity utilisation would ease the pricing level as overheads would spread more evenly. Machine hour rates will come down as depreciation and other fixed costs will be spread across a greater number of machine hours.

Financial analysis

Analysis has been done on the performance data for the last five financial years from the IDTR's Annual Reports made available for the following indicators:

- Net worth
- Profitability analysis
- Trend of income and expenditure

Net worth

The net worth of an enterprise is the sum of total equity and retained earnings. Net worth reflects the value of the enterprise, considering it is composed primarily of the money that has been invested in it since its inception, as well as the retained earnings for the duration of its operation. Net worth of ITDR is shown in the Table 15.

Table 15: Net worth trend over 5 years

Particulars	2005 – 06	2006 - 07	2007 - 08	2008 - 09	2009 -10
Net worth	25,078,361	44,576,188	62,735,220	76,991,230	94,425,842
Year on year increase		5%	4%	3%	4%

The net worth of IDTR, Jamshedpur has been increasing every year around 3-4%, which is a healthy sign as it implies an increase in equity or value of the Tool-Room. However, year-on-year growth in net worth is small. During the years, the Tool- Room was also in receipt of government grants.

Table 16 reflects the trend of Government grants being received by of IDTR, Jamshedpur:

Table 16: Government Grants

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10
Contribution from GOI	46,018,886	70,833,170	00,833,170	30,833,170	64,833,170
Contribution from Govt of Bihar / Jharkhand	-	2,208,000	929,450	-	-

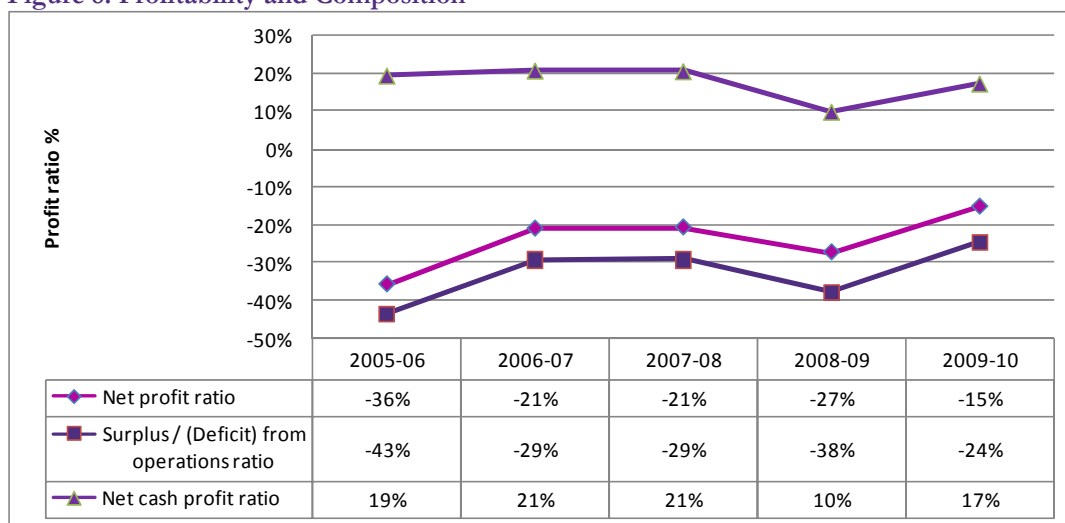
Net worth of the Tool-Room excluding the Government grants received is given in the Table 17. It is now positive and increasing even without Government grant which is laudable.

Table 17: Net Worth without Government grants

Particulars	2005 - 06	2006 - 07	2007 - 08	2008 - 09	2009 - 10
Net worth excluding government grants	400,078,361	412,368,188	431,805,770	442,991,230	464,425,842
Year-on-year increase		3%	5%	3%	5%

Profitability analysis

Figure 8: Profitability and Composition



The Tool-Room has been generating a deficit from operations as well as on an overall basis. The deficit ratio was high in FY 2005-06 at 36% but has reduced to 15% in 2009-10.

The other income has reduced the deficit from operations significantly but is still not enough to cover the expenses. The deficit from operations on an average for 5 years from FY 2005-2010 has been 33% but due to other income, the deficit has been 24%. Thus other income, comprising mostly of interest income, has set off the deficit by 9%.

In spite of generating a deficit, the Tool-Room has still been generating a cash surplus from its operations. The same has been 18% on an average in the last 5 years during FY 2005-2010.

The revenues are equally contributed by training income and sale of finished goods. Training revenues contribute to around 51% of the total revenues on an average in the last 5 years. Revenue from sale of finished goods contributes around 42% in the last five years. The contribution of sale of goods to total revenue has been declining steadily from 54% in 2005-06 to 40% in 2007-08 and finally 31% in 2009-10. On the other hand, the revenue contribution from training has been increasing steadily from 41% in 2005-06 to 62% in 2010-11.

In FY 2005-06, depreciation accounted for almost 41% of the total expenses. However, over the years, the emphasis has shifted from depreciation to establishment expenses, and the establishment expense costs contributed to 39% of the total expenses in FY 2009-10.

Whereas, the share of depreciation towards the total expenses has gone down gradually to 41% in FY 2005-06, 25% in FY 2007-08 and finally to 29% in FY 2009-10.

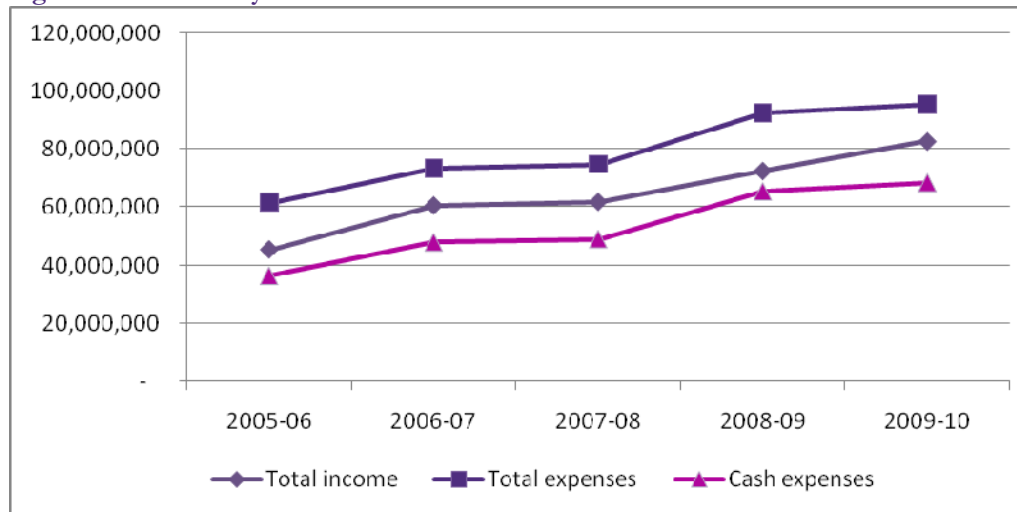
Trend of income and expenditure

Grant Thornton India conducted a trend analysis of the income and expenditure of IDTR, Jamshedpur based on the audited financial statements provided for the five years ended March 31, 2010. Given below is a diagram reflecting the relationship between the income, expenses and cash expenses:

Table 18: Trend of Income and Expenditure

Particulars	2005 - 06	2006 - 07	2007 - 08	2008 - 09	2009 - 10
Total income	45,320,202	60,614,278	61,829,755	72,568,673	82,789,708
Total expenses	61,484,325	73,324,451	74,600,173	92,312,663	95,355,096
Cash expenses	36,492,734	47,997,415	49,088,209	65,411,179	68,411,883

Figure 9: Trend Analysis



The Tool-Room has been operating in surplus from past five years. However, Tool-Room has not been able to achieve self sufficiency without depreciation in any of the years.

Revenue has grown at an average rate of 17% and the expenses have grown at an average rate of 12%, which is a healthy sign for the Tool-Room. The Tool-Room has had positive cash flows as the income has always been in excess of cash expenses. The cash expenses have been increasing at a faster rate of 18%, compared to those of total expenses, which have been increasing at a rate of 12%, and also as compared to the rate of increase in revenue of the Tool-Room. Keeping other factors constant and based on the average rates computed, the profitability of the Tool-Room can reduce with time if rate of growth of cash expenses is not checked.

Chapter IV

Overview of Local Business Environment from Tool-Room Perspective

This chapter assesses the location of the Tool-Room and the market potential for it to expand its services. It also analyses the availability of raw material and machinery suppliers in the region.

Location and market potential

Indo-Danish Tool-Room (IDTR) is located in Phase VI, Tata Kandra Road, Gamharia, Jamshedpur in the State of Jharkhand. It is well-connected by rail and road. Jamshedpur has a small airport but commercial flights to it have been discontinued for many years due to less traffic. Nearest airport now is Ranchi and then Kolkata which are well connected by regular flights to Bengaluru, Delhi, Chennai and Mumbai. It also has the strategic advantage of being in the midst of industries which are heavy users of tools, moulds and dies. Nearly 80% of industrial units in the region manufacture auto components. IDTR can increase its market potential if it can increase the physical size of the press tools it can manufacture since there is also no competitor in the city and its surrounding areas

The supplier chain

Raw material suppliers

Tool steel used all over the country for making critical parts like cores and cavities of moulds are imported from Germany, Austria, Poland, Japan and Sweden and, for less critical applications, from Taiwan and China. There is a large network of importers and stockists in the country with major concentration in Mumbai and Chennai and, a little on the lower side, in Kolkata. Local stockists cannot supply good-quality tool steel. These can be purchased from Kolkata or Mumbai and Chennai.

Similarly, stockists and agents of standard moulds and die sets, and their components/ parts, have limited presence in Kolkata but better stockists are in Mumbai and Chennai. Some complex parts like heat tubes for hot runner moulds are not made in the country but are imported which are also arranged by these agents/ stockists. IDTR can also import these directly.

Machinery suppliers

There are two kinds of machines at the IDTR, conventional and precision. The conventional machines are mostly from domestic manufacturers. IDTR has the know-how to service such machine tools in-house. The other kinds of machine tools are CNC machine tools and other precision machines which are to some extent produced in the country. However, high-end machine tools of this category are imported mainly from Switzerland and Germany and lately also from China where less accuracy and versatility are acceptable.

Backward Linkages

Summary of backward linkages is given in Table 19

Table 19: Backward linkages

Input	Linkage/ sources
Raw Materials	Limited stockists in Kolkata. Major stockists/ importers of alloy tool steels are located in Mumbai and Chennai.
Machine Tools	Manufacturers for indigenous machines. Direct imports for imported machines, nearly all such suppliers have agents in India for liaison and service back up.
Standard Moulds and Die sets	Manufacturers or stockists, mostly outside Jamshedpur. Some complex parts like hot tubes for hot runners etc are imported but stocked by stockists and traders.
Cutting Tools	Manufacturers and stockists. Some stockists of a very limited range in Jamshedpur, beyond that Kolkata.
Consumables like oils, greases, salts	Stockists in Jamshedpur
Spares	From OEMs, except for standard spares like bearings, which are available locally to some extent and from stockists in Kolkata.
Specialised Maintenance/Servicing of CNC Machines	By the machinery suppliers. In case of imported machines, this is provided by agents of the foreign suppliers through annual Maintenance Contracts which tend to be expensive or on visit basis. Service engineers are based at the headquarters of the agent and arranged on need basis.

Growth of private commercial Tool-Rooms

There are private commercial Tool-Rooms in Jamshedpur. Most of them are small and specialise in specific areas. While private Tool-Rooms have flexibility in decision making like procurement of raw materials, consumables and equipment, they lack modern technologies like advanced CNC machining. IDTR cannot meet the gap between the demand and supply of tools but it can act as a facilitator and encourage private commercial Tool-Rooms to expand their operations by using common facilities at IDTR. IDTR should support them in the following areas:

- design and development of products and tools
- common facilities in precision machining
- developments of prototypes
- making tool parts for which commercial Tool-Rooms do not have the facilities
- assistance in programming of CNC machines to the extent available with these Tool-Rooms
- assistance in selection of new equipment

Chapter V

Inclusive Growth underlined by Social Impact

IDTR has made impact in the areas of training and production.

IDTR trained 796 trainees in long-term courses and 4754 trainees in short-term courses in 2010-2011 under various training programmes resulting in employment generation. Since majority of these trainees are from the region as mentioned above, it is a great booster to which IDTR is contributing socially.

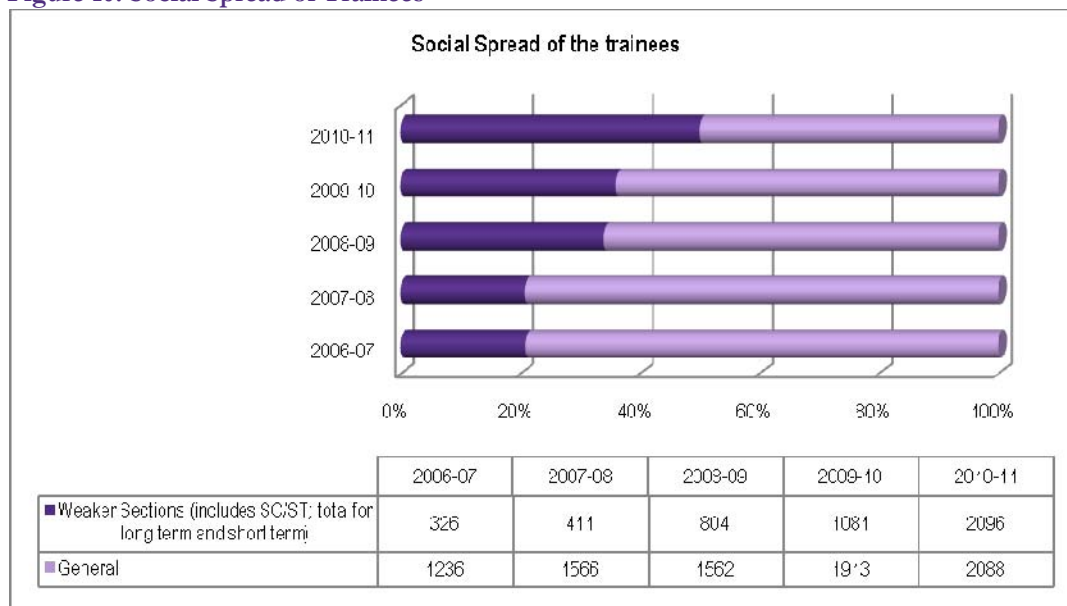
Environment

It has changed the way heat treatment was done in the region by adopting state-of-the-art electricity powered vacuum heat treatment furnaces, which are environment friendly. No toxic wastes are created as is the case with salt baths and oil-fired muffle furnaces. The whole process takes place in closed chamber under vacuum.

Social spread of trainees

Social spread of trainees at IDTR Jamshedpur is reflected in Figure 10:

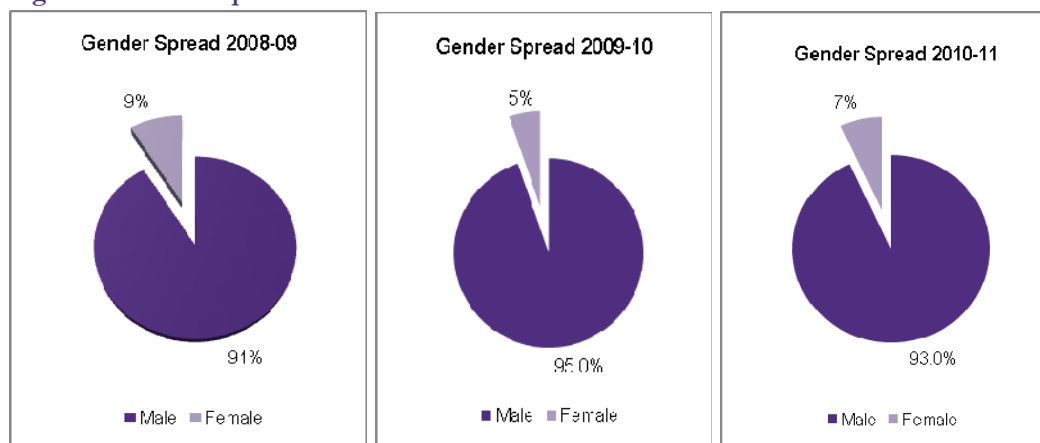
Figure 10: Social Spread of Trainees



Gender spread

IDTR's contribution in empowerment of women is presently at low level. In its training programmes, only 9%, 5% and 7% were women candidates in 2008-09, 2009-10 and 2010-11, respectively, as shown in the pie diagrams below. Being an important segment, ITDR should work on annual targets to train women under various programmes to improve their representation.

Figure 11: Gender spread



SWOT

Strengths

- IDTR is the most well-equipped commercial Tool Room in the region
- It is set up with development objectives and offers its services without commercial objectives
- It has dedicated and motivated team of officers and staff
- It has expertise in the manufacture of press tools for auto components for which there is a great local demand
- It has developed expertise in vocational training and has earned good reputation for it
- It does not depend on the Government for grants for recurring expenditure
- It has facility of vacuum heat treatment which is unique in the region

Weaknesses

- Utilisation of capacity from high-value machines is low, 33 % by industry norms
- Price of tools is high for MSMEs
- IDTR does not have independence to adopt its own incentive scheme. Scheme introduced on guidelines of GoI is complex and has ceiling on maximum payment even out of the amount which has been earned
- Over the years emphasis has shifted from Tool Design & Manufacture to Training
- Emphasis has shifted away from hand-holding of MSMEs

Opportunities

- Significant scope for scaling up training and tooling services given the favourable local market conditions
- Abundant demand for tooling. Tooling demand in 2010-11 was Rs.13225 crore. It is growing at a CAGR of 13%.
- Tooling demand is estimated to grow to Rs.23620 crore by 2015 (Source: TAGMA)
- Abundant demand for tools from auto OEMs and auto component industry of which IDTR has the expertise. Market from these two segments is Rs.6700 crore. It forms 50% of the total tooling demand. (Source: TAGMA)
- Huge national requirement of trained manpower
- Government support for capital investment is available

Threats

- Monitoring-based only indicators of self sustainability have diluted impact on MSMEs and tooling
- Easy procedures and low customs duties for import of tools. TAGMA's latest survey indicates that 31% tools were imported in the country in 2010-11
- Low price levels and faster deliveries of tools from some countries, especially China
- MSMEs prefer low costs of tools and therefore, suppliers that provide low-cost tools and timely delivery

Conclusion

The IDTR has made significant impact in creating skilled manpower. On the financial front it is recovering full costs without depreciation and has marginally missed recovering costs including depreciation when considered on cash receipt basis. If accrual is the basis it has recovered costs including depreciation. It has also contributed significantly to environment protection by introducing the vacuum heat treatment technology, replacing the old salt baths, which were a health hazard. However, sustaining and scaling up the impact in the direction of assistance to MSMEs is imperative which would be a major challenge, given constraints like more easy money available from large industries and training courses when the mandate is to recover costs including depreciation.

The policy direction and monitoring indicators mainly give weightage to self sustainability which needs to be revisited, as the impact on MSMEs and job creation is of equal significance. Over emphasis on cost recovery and related financial indicators has danger of reduced impact on MSMEs. It is also necessary that the IDTR develops an understanding of the current and emerging MSME needs (especially local clusters) on both training and tooling fronts. A formal survey of the MSME market relevant to the IDTR is needed for this purpose. This would be essential to establish short- and long-term targets with an eye on the impact on MSMEs.

Annexure I

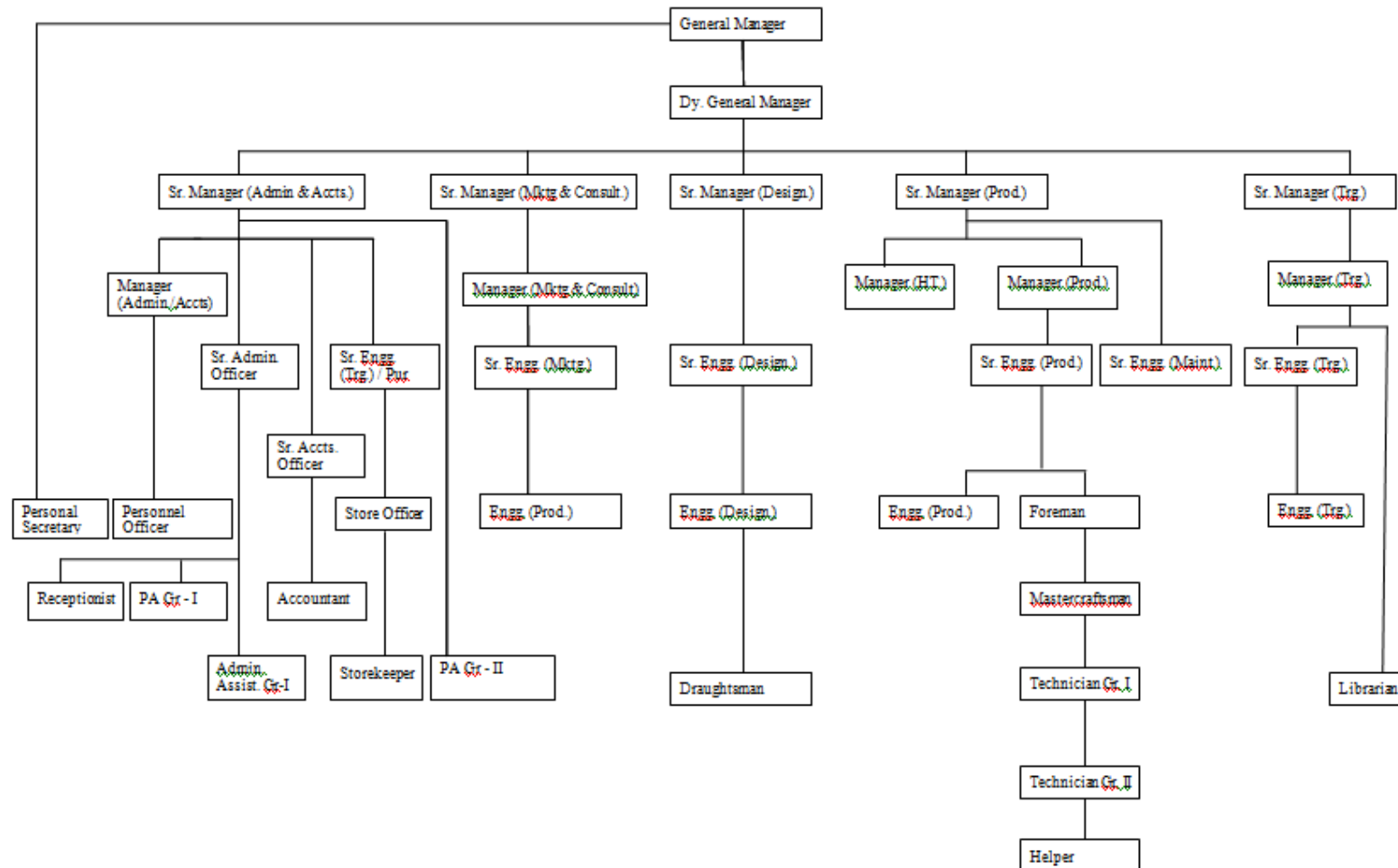
Details of Visits

Details of visit of GT Team to IDTR Jamshedpur

Place	Organisation	Official met
Jamshedpur	MSME Indo-Danish Tool Room	Mr. SS Kohli, General Manager
Jamshedpur	MSME Indo-Danish Tool Room	Mr. S Bhowmick, Manager
Jamshedpur	AUTO Profiles LTD	Mr.R.K. Verma, Director
Jamshedpur	HIGHCO Engineers (P) LTD	Mr. T.K. Sahu, Ex. Director
Jamshedpur	HIGHCO Engineers (P) LTD	Mr. S.K. Singh, M.D.
Jamshedpur	Tata Motors LTD	Mr.A.K.Mukhopadhyay, DGM

Annexure II

Organisational Chart



Annexure III

Training Courses

Course	Duration	Fee/student	Support from Ministry of MSME/Others (State etc.)	Intake	Selection Criterion	Certification by	Typical job on placement	Post Placement Tracking	Soft Skills	Entry Level Salary Rs. P.m.
Long Term										
Diploma in Tool & Die Making	4 year	30000/-P.A.		70	Entrance Test	AICTE				14000/-
ITI Machinist	2 Year	18000/-P.A.		28	Entrance Test	NCVT				21000/-
ITI Fitter	2 Year	15000/-P.A.		32	Entrance Test	NCVT				18000/-
Advance Machinist course	2 Year		Govt. of Jharkhand	100	Entrance Test	IDTR				
Post graduate diploma in comp. added tool design	1 year	50000/-		30	First come first serve	IDTR				
Post diploma in manufacturing technology & CAD/CAM	1 year	48000/-		30	First come first serve	IDTR				
Condense Tool & Die Making	1 year	60000/-		24	First come first serve	IDTR				
Mid Term										
Post Graduate/diploma in & CAD/CAM/CAE	6 months	30000/-		30	First come first serve	IDTR				
Advance CNC programming & Operation	6 months	18000/-		40	First come first serve	IDTR				

Course	Duration	Fee/student	Support from Ministry of MSME/Others (State etc.)	Intake	Selection Criterion	Certification by	Typical job on placement	Post Placement Tracking	Soft Skills	Entry Level Salary Rs. P.m.
Post diploma in comp. added tool design	6 months	36000/-		30	First come first serve	IDTR				
Post Graduate/diploma in Industrial Automation	6 months	34000/-		30	First come first serve	IDTR				
Advance certificate course on Inspection & Quality control	6 months	18000/-		30	First come first serve	IDTR				
Diploma in computer Hardware & Networking	6 months	12000/-		30	First come first serve	IDTR				
Certificate course in Advance computer Networking	6 months	15000/-		30	First come first serve	IDTR				
Certificate course on Advance Welding technology	6 months	12000/-		30	First come first serve	IDTR				

Annexure IV

Production Equipment

CNC M/cs	Type	Make/Model	Max Job Wt	Axes	Accuracy	Year of Installation	Number of Hours utilised			
							2010 – 11	2009 – 10	2008 – 09	2007 – 08
CML-1	CNC MILLING	MIKRON	400	600X600X400	0.01/300	1995	4525	3047	4608	4608
CML-2	CNC MILLING	MIKRON	350	560X500X400	0.01/300	1995	3003	1390	0	3504
CML-3	CNC MILLING	MIKRON			0.01/300	1995	4603	2874	4512	4272
CML- MTAP	CNC MILLING	M-TAP	200	300X250X250	0.01/300	INSTL. IN JUL-2007	3673	1966	1470	1778
CML- MAKINO	CNC MILLING	MAKINO	600	800X350X450	0.01/300	INSTAL. IN JUN- 2008	4698	4127	4272	0
CML- DMG	CNC MILLING	DECKEL	1000	1050X800X560	0.01/300	2006	5312	4079	3792	4704
HMC- BFW	CNC MILLING	BFW	500	700X560X560		INST IN JUN-07	4950	2939	3456	3312
WEDM – S.CUT	WIRE CUT	ELECTRONIA	300	300X400X	0.01/300	1999	4375	2284	2880	2832
W.EDM- FANUC	WIRE CUT	FANUC		320X220X180	0.005/300	2007	5201	2874	3648	4032
EDM-150	EDM	AGIE	200	350X250X350	0.01/300	1996	3883	2038	3744	2976

CNC M/cs	Type	Make/Model	Max Job Wt	Axes	Accuracy	Year of Installation	Number of Hours utilised			
							2010 – 11	2009 – 10	2008 – 09	2007 – 08
EDM-250	EDM	AGIE	400	700X500X500	0.01/300	1996	4121	2513	3024	3696
EDM-OSCAR	EDM	OSCAR	200	400X300X300	0.01/300	2009	2552	1369	0	0
JG-MOORE	JIG GRINDING	MOORE		450X280X	0.005/300	1996	2233	1298	1148	1464
CG-STUDER	CYLINDRICAL GRINDING	STUDER	70	OD350X1050	0.005/300	1996	4618	1523	3552	4416
OPG	OPTICAL PROFILE GRINDING			120X50X80	0.005/300	2003	3284	1569	1968	2112



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Strategic Assessment of MSME Tool Rooms

As Is Assessment Report – CTTC Kolkata

Prepared for

Micro, Small and Medium Enterprises Umbrella Programme



Knowledge Partner:



Grant Thornton

Contents

	Page
Abbreviations used	5
Executive Summary	7
Introduction	10
Chapter I - Organisational Profile	12
Chapter II–Governance, Management Systems and Processes	15
Chapter III - Organisational Assessment	19
Chapter IV - Overview of Local Business Environment from Tool-Room perspective	34
Chapter V - Inclusive Growth underlined by Social Impact	36
SWOT	38
Conclusion	39
Annexure I – Details of visit	40
Annexure II: Training Courses	41
Annexure III – Production Equipment	44
Annexure IV – CAD/CAM Software in Training Equipment	46

Table 1: CTTC Profile	12
Table 2: Annual targets	16
Table 3: Service mix of CTTC Kolkata.....	19
Table 4: Service Sector mix	20
Table 5: Break-up of revenue contribution	20
Table 6: Sector mix of revenue from production of services (Average of 2006-2011).....	20
Table 7: Income from various courses in Rs. lakhs	22
Table 8: Spread of products, percentages based on values	24
Table 9: Industry break up	25
Table 10: Facility break-up.....	27
Table 11: Power back up	27
Table 12: Value of Training Equipment	28
Table 13: Personnel.....	29
Table 14: Machine utilisation	30
Table 15: Net worth	31
Table 16: Government grants.....	31
Table 17: Net worth without Government grants	31
Table 18: Income-expenditure trend analysis	33
Table 19: Backward linkages	35
Figure 1: Organisation Chart	14
Figure 2: Business plan- Production services.....	21
Figure 3: Admission trend from 2006-07 to 2010-2011.....	22
Figure 4: Training income from various courses.....	22
Figure 5: Spread of income: tooling services	25
Figure 6: Repeat customers	26
Figure 7: Geographic spread of the production services	26
Figure 8: Break up of physical infrastructure	27
Figure 9: Profitability and Composition	32
Figure 10: Income-expenditure trend analysis	33
Figure 11: Social spread of the trainees.....	37
Figure 12: Gender spread	37

Abbreviations used

AICTE	All India Council of Technical Education
CAGR	Compound Annual Growth Rate
CAD	Computer Aided Design
CAM	Computer Aided Manufacturing
CTTC	Central Tool Room and Training Centre
CNC	Computer Numerical Control
D	Dimensional
DANIDA	Danish International Development Agency
DC	Development Commissioner
DG	Diesel Generating
EDM	Electric Discharge Machining
FMIS	Financial and Management Information System
ESPD	Entrepreneurship & Skill Development Programme
FY	Financial Year
GC	Governing Council
GFR	General Financial Regulations
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GOI	Government of India
HOD	Head of Department
HRD	Human Resource Development
HT	Heat Treatment
ISO	International Standards Organisation
IT	Information Technology
ITI	Industrial Training Institute
IMTEX	Indian Metal-cutting Machine Tool Exhibition
IITF	India International Trade Fair
L 1	First Lowest
M/C	Machine
MIS	Management Information System
MoMSME	Ministry of Micro, Small and Medium Enterprises
MSME	Micro, Small and Medium Enterprises
NTTF	Nettur Technical Training Foundation
OEM	Original Equipment Manufacturers
PG	Post Graduate
RP	Rapid Prototyping
SOP	Standard Operating Procedure

Executive Summary

Central Tool-Room and Training Centre (CTTC) at Kolkata is the oldest of the three Tool-Rooms set up, by Government of India, under Indo-Danish Technical Co-operation Tool-Room Programme for the design and manufacture of tools and training of manpower in employable skills in tool-making and allied trades. CTTC is operating as Government of India Society under Chairmanship of DC MSME since 1978. During the collaboration period the total investment in the project was Rs.4.90 crore of which the Government of India and Government of Denmark contributed Rs.0.85 crore and Rs. 4.05 crores, respectively. State of the art tool production facility is installed at CTTC which includes high end tool machines CNC milling machines, CNC lathes, CMM, Vacuum Heat Treatment plant etc.

CTTC's operating income and expenditure, without depreciation, in recent years is as below:

Year	2006-07	2007-08	2008-09	2009-10	2010-11
Income	286.18	374.61	449.82	498.04	543.49
Recurring Expenditure	399.57	425.90	531.83	646.58	598.75
Income minus Expenditure	(-)113.39	(-)51.30	(-)82.01	(-)148.54	(-)55.26

CTTC was the forerunner on account of financial self sufficiency. It was the first among the 10 Tool-Rooms to recover costs without depreciation. This performance however was not sustainable. Now, it seeks Government grants even for meeting recurring expenses. During the last 5 years, its income has increased at an average rate of 18%.The expenditure (without depreciation) during the same period increased at 11%, signifying narrowing gap between income and expenditure.

Establishment expenses form the main constituent of expenditure for the CTTC, accounting for 61% of its expenditure. On recovery account, training is doing better. In 2010-11, Training contributed 74% to revenue and trained 2817 persons through its programmes.

CTTC has manpower of 72. Some employees at middle management level, responsible for important functions, have stayed in the same position for 15 years although higher posts are available, implying lack of good HRD and career progression policies. It also lacks incentive schemes needed to drive employee motivation towards better performance. There is a need to effectively utilise manpower for production which will directly impact revenues as demonstrated by training programmes which help in generating nearly three times revenue in comparison to production.

CTTC's objective was to assist MSMEs of the eastern region to enhance their competitiveness by providing to them high-quality tools, common facilities for machining and heat treatment, consultancy to increase the quality and productivity of their products, training young men for the industry and to sharpen skills of existing employees from the industry. In the initial years, CTTC supported the industry effectively. In the recent past stress has been more on cost recovery for which targets are fixed. However, no targets are kept in view for providing assistance to MSMEs and their outreach and impact. As a result, priority is to go in for jobs which give higher revenues.

CTTC being a Government of India Society has to work under the guidelines of the Government. However, there are areas in which the autonomy built into the system is not being effectively used. Participation of members representing the industry is less effective in formulation of policies, marketing the services and in design of industry-oriented training programmes.

Some of the key challenges, constraints and solutions are enumerated below:

<u>Function/ process</u>	<u>Challenge/ constraints</u>	<u>Key solutions/ ideas</u>
Policy goals and direction	CTTC objectives are to enhance the competitiveness of MSME through tooling services and skilled manpower. However, monitoring of performance is mainly on financial parameters and not so much on outreach and impact.	A balanced approach needs to be synthesised so that assistance to MSMEs is not lost sight of while aiming for self-sufficiency. Assistance should be measured in value and not merely in numbers.
Autonomy of Institution	The CTTC is set up as an autonomous society but is still to a large extent guided by Government policies. The decision making body, the Governing Council meets once in a year on an average.	Setting up one apex body under DC MSME to administer all Tool-Rooms would be examined while consolidating management issues for all 10 Tool-Rooms.
Core Management Team	Motivation required in the core management team and staff.	Career improvement issues should be readdressed. If required, vacancies at lower levels could be kept vacant instead of those at higher levels for better leadership at each level to drive the performance.
Management Systems	Data on cost estimates for quoting and actual costs is not analysed. Post placement tracking of trainees is not undertaken.	Design of IT enabled Financial and Management Information System (FMIS) should be designed and introduced
Procurement System	CTTC follows General Financial Rules (GFR) calling for quotations and decision making guided by L 1 principle due to which suppliers tend to quote lower rates, sometimes compromising on quality.	Rate contract system should be considered. Development of a procurement manual would be beneficial.
Networking with other institutions and alumni	There is no networking with other Tool-Rooms/ institutions except in GMs meeting which usually takes place once a year. The Tool-Room does not leverage the network of its alumni to enhance its marketing.	Networking with other Tool-Rooms under MoMSME, also at the Head of Department level, would be useful. Again, IT enabled platform networking with alumni is essential.
Pricing of services	The machine hour rates were approved by the Governing Council in the year 2000 and thereafter only on ad-hoc basis. Industry finds prices very high.	Machine hour rates should be re-examined with detailed calculations.
Motivation and incentive system	Employees lack motivation. There is no incentive scheme.	Incentive scheme should be introduced. Career progression should be revisited.
Lead time and	The average lead time is long and price	Production planning and control

price level	level high for micro and small units.	should be reorganised. Better capacity utilisation can bring down the prices due to even spread of overheads/indirect costs.

Introduction

Background information

Tool-Room is the backbone of the industry. Manufacturing excellence begins with tools, dies and moulds. To foster the growth of micro, small and medium scale industries, the Government of India set up ten Tool-Rooms across the country with state-of-the-art equipment for design and manufacture of tools and for training of manpower in employable skills. Of these, four were set up with the assistance of the Government of Germany, three with the assistance of Government of Denmark, two under UNDP and one without any external assistance. Central Tool-Room and Training Centre, Kolkata is one of three Tool-Rooms set up with Danish assistance. The Tool-Rooms are autonomous Government of India societies with DC MSME as the Chairman. The Tool-Rooms have now been operating for about 10 years after the close of the agreements of external assistance. Deutsche Gesellschaft für Internationale Zusammenarbeit is supporting an evaluation study of 10 Tool-Rooms with M/s Grant Thornton Advisory Private Limited retained as Consultants to carry out the Study.

Terms of reference

Tasks entrusted to the Consultants are 'As Is' reports of ten Tool-Rooms, their ranking, recommendations on improving their performance and an action plan for the same. This is 'As Is' report in respect of Central Tool-Room and Training Centre at Kolkata.

The consultant team has been tasked to analyse the existing strengths and weaknesses of the ten Tool-Rooms in terms of their management, finances, human resources, technology and infrastructure, as part of the 'AS IS' assessment that includes the following:

- institutional/ organisational development study of the scheme consisting of political economy aspects involving actors, financial flows, management systems and inter-agency issues
- stakeholder feedback on existing services, from MSMEs and concerned business associations
- stakeholder feedback on further requirements by MSMEs and relevant business associations
- training needs of Tool-Room personnel
- comparison of services with similar private sector and German facilities
- best practices from comparable national institutions such as the Nettur Technical Training Foundation (NTTF), Bengaluru (NTTF is a private educational trust established with the help of the Government of Switzerland)

Methodology

Data has been collected through secondary research, publicly available information on MSME Tool-Rooms and through a structured questionnaire. Facility of the Tool-Room was visited and series of meetings and discussions took place with senior and middle management, local associations, suppliers, users & non users MSMEs, large client and state government agencies for qualitative assessment.¹

Based on the quantitative information and qualitative assessment, functioning of each Tool-Room has been assessed and analysed to provide actionable recommendations for improving alignment of services to the strategic goals of the Government in setting them up. This is done through an optimum mix of different service and delivery approach, increased revenue, outreach and impact; improved organisational procedures and governance mechanisms, technological and human resource development, enhanced networking, etc. Recommendations shall be accompanied by a time bound and cost estimated action plan for the DC MSME to implement. Cost estimates would refer to requirements of additional machinery and equipment, general infrastructure, staff restructuring, training, etc that would be needed to implement the recommendations. In addition, an institutional analysis framework that can be used by the Ministry in future will also be developed.

However, this report is limited to 'AS IS' assessment and analysis of Tool-Room functioning and recommendations are part of a separate report for all the 10 Tool-Rooms.

Structure of the report

Given below is a summary of how the report has been structured:

Chapter I – Organisation Profile: A brief description of CTTC Kolkata.

Chapter II – Governance and Management Systems: this chapter assesses the autonomy of the Tool-Room and its Chief Executive, the General Manager, guidelines defined by the Ministry of MSME and the level of its interaction with DC MSME.

Chapter III – Organisational Assessment: this chapter assesses the current status of service portfolio, technological infrastructure, marketing strategy, finance, management systems, human resource and its impacts against the stated policy goals.

Chapter IV – Overview of Local Business Environment from Tool-Room perspective: This chapter assesses the location of the Tool-Room and the market potential for it to expand its services. It also analyses the availability of raw material and machinery suppliers in the region.

Chapter V – Inclusive growth underlined by Social Impact: This chapter analyses the impact made by CTTC in all the three areas of training, tooling and dissemination of environment-friendly technologies to MSMEs.

¹ Complete list of officials visited can be found in Annexure I.

Chapter I

Organisational Profile

CTTC Kolkata

The Government of India established the Central Tool-Room and Training centre (CTTC) in Kolkata under Indo-Danish Technical Co-operation Agreement of 1976. The Government of Denmark, through DANIDA, provided technical and financial support. The State Government of West Bengal did not participate financially, except donation of a plot of land to the project.

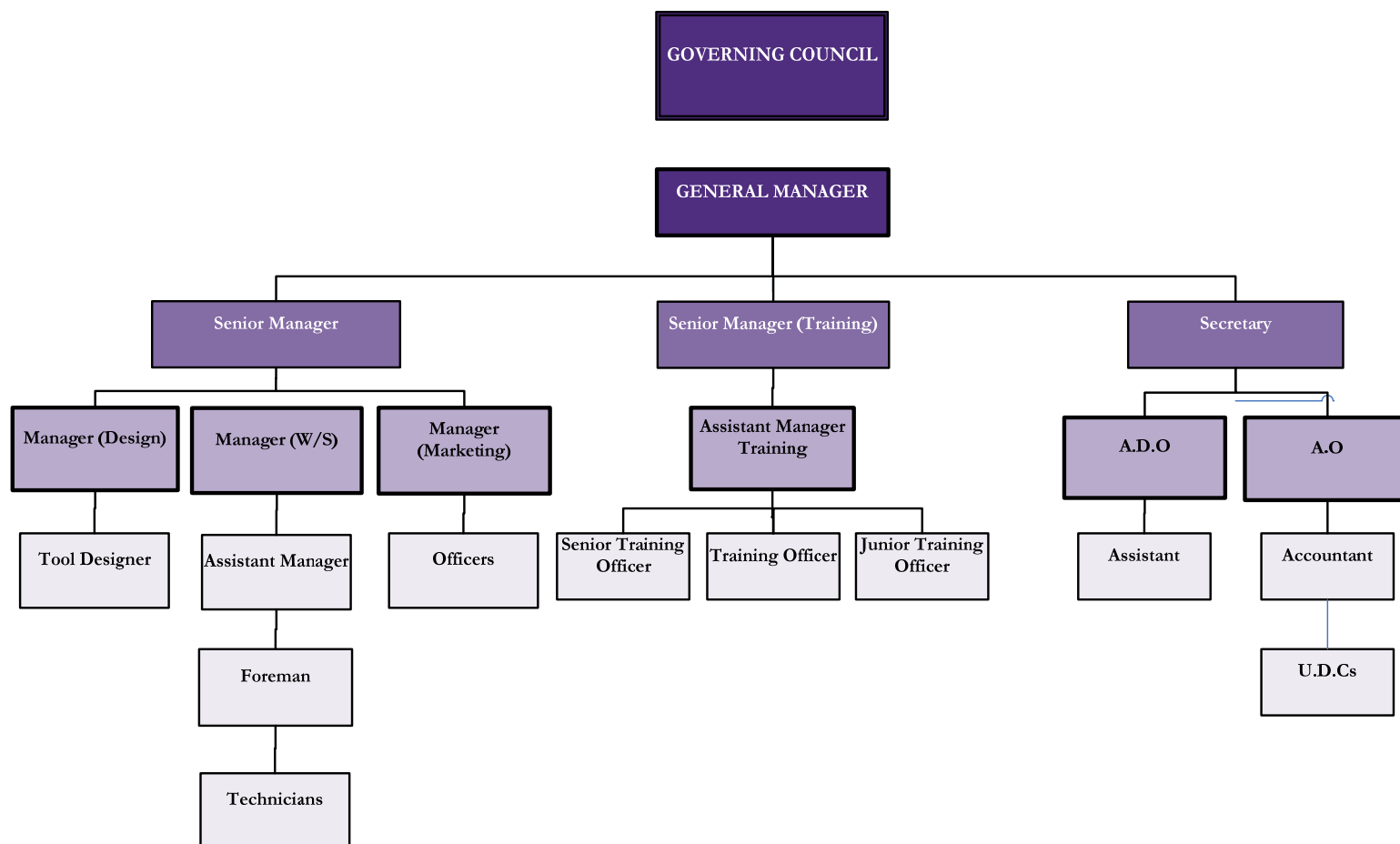
CTTC had been set up as a "Government of India Society" under the Ministry of Micro, Small & Medium Enterprises, Government of India. The Governing Council constituted by the Ministry manages the affairs of the society. DC MSME is the Chairman of the Governing Council.

Table 1: CTTC Profile

1.	Project Background	Central Tool-Room & Training Centre (CTTC), Kolkata was set up by GoI, DC MSME to meet the growing needs of tooling and to assist MSMEs in India in general and the eastern region in particular. The total investment during the agreement period was Rs.4.05 crore. Its operations started in 1978.								
2.	External Agency	Danish International Development Agency (DANIDA)								
3.	Funding Pattern INR in crore	<table><tr><td>GoI</td><td>DANIDA</td><td>Total</td></tr><tr><td>0.85</td><td>4.05</td><td>4.90</td></tr></table>			GoI	DANIDA	Total	0.85	4.05	4.90
GoI	DANIDA	Total								
0.85	4.05	4.90								
4.	Organisational Structure	In order to provide greater autonomy, the Centre has been established as a Government of India Society. The Management of affairs of the Centre rests with the Governing Council constituted by the Government of India. Development Commissioner (MSME), Government of India is the President of the Society and Chairman of its Governing Council.								
5.	Objectives	• To increase efficiency of SSI units by providing consultancy and common service facilities in the areas of design and production of tools, jigs and fixtures moulds & dies etc. • To design and manufacture precision tools such as Press Tools, moulds and dies for metal castings, jigs and fixtures and special purpose tools. • To conduct long-term and short-term training courses in tool and die making, machining and fitting and short-term courses on related subjects to personnel working in the industries.								

		• Providing advisory/ consultancy service and design assistance. • Providing project management services for setting up Tool-Rooms/ Mini Tool-Rooms & Training Centres / CAD-CAM Training centres.
6.	Technology	Following facilities/ technologies are available at CTTC for tooling, production, training and rapid prototyping: • High precision machines like CNC milling machines, wire cut machines, grinding machines etc. • Precision inspection facilities like height gauge, tool maker's microscope, hardness tester, CMM, surface roughness testing equipment etc. • Rapid Prototyping and CAD/ CAM facilities for development of new products • Injection moulding machines with necessary accessories. These are used to conduct trials of moulds and short runs of components • Vacuum heat treatment
7.	Training Programmes	Long-term training courses (More than one year duration) – Diploma in tool and die making course. The duration of the course is 4 years. It is approved by AICTE, Government of India and Government of West Bengal. Short-term training courses • Duration: 6 months to 1 year – Post Diploma in CAD/ CAM – Post Diploma in Tool Design – Certificate Course in Machinist – Certificate Course in CNC Machining – Certificate Course in Auto CAD Application • Duration: up to 6 months – Short-term training for workman, craftsman and Engineers – Technical training programme for persons from MSME sector, industries, institutions and for fresh degree, diploma and ITI holders – Customised training programme in CAD/ CAM, CNC Technology etc using softwares like Pro E, Unigraphics , Master CAM, Auto CAD – Seminars and workshops in hi-tech specific areas

Figure 1: Organisation Chart



Chapter II

Governance, Management Systems and Processes

This chapter assesses the autonomy given to the General Manager of the Tool-Room, guidelines defined by the Ministry of MSME and the level of interaction with DC MSME. This also assesses the role of GC in the overall functioning and to analyse how all these factors are contributing or hindering the performance of the Tool Room.

Policy goals and direction

Monitoring of performance is mainly on financial parameters and not so much on outreach and impact. The present policy direction emphasises on cost recovery without depreciation to start with, followed by cost recovery with depreciation. Management efforts are directed accordingly. Production which was a major part of revenue, earlier, today stands at only 25% of revenue from training and production put together. Even out of this small proportion, about 38% is from component production which gives more money. A clear reason that emerged from interactions with the stakeholders is that the present policy direction emphasises diversification to common service facilities for production of components, project management services and production jobs from larger enterprises because of higher revenue. Likewise much of the initiative is towards summer vacation training of students pursuing engineering studies, which is not towards bridging the industrial skill gap faced by MSMEs.

Autonomy of institution

The CTTC is set up as an autonomous society but is still, to a large extent guided by the Government policies, and in some cases even by Government rules and regulations. The decision making body, the Governing Council meets once in a year on an average that mostly coincides with the Annual General Meetings called for approving annual accounts and annual reports. The private sector members of the GC are not active participants.

Characteristics of core management team

Enthusiasm of the management team and staff for the work was found to be lukewarm. This is reflected in the performance. One of the reasons which could be observed was career planning at middle management level. Some of them were at the same level for 15 years although vacancies at higher level were available. Motivation of the core management team and staff needs to be looked into by better communication, human relations and an appropriate incentive scheme. Training in skill development and exposure through management development programmes to present techniques of communication and motivation, HRD, production management and leadership is needed. Suitable training and capacity building of the staff is necessary.

Reason cited by the management for not filling higher level vacancies was that it would increase the financial burden. However, if higher posts are filled and lower ones are kept vacant, increase in salary bill would be marginal. Also, it would motivate the team. Higher productivity as a result of this motivation could off-set the additional costs.

Annual targets

There is no formal need assessment undertaken to estimate the market opportunity for its services. Each year annual targets are fixed for training and production which are not linked to the market opportunity or desired level of impact. The targets are financial and not physical. There are no targets with respect to the value of assistance to MSMEs or the number of trainees and representation of women in it. The table below provides details of targets achieved by the CTTC in 2010-11.

Table 2: Annual targets

Service	Target	Achievement	Achievement %
Training (Physical)	---	2817 persons	---
Training (Revenue, Rs., lakhs)	450.00	401.40	89
Production (Revenue, Rs., lakhs)	185.00	135.75	73
Revenue, other sources, Rs., lakhs	---	6.34	----
Total revenue, (Rs., lakhs)	635.00	543.49	86 %

Source: Action Plan report submitted by CTTC

Management system

The CTTC is an ISO 9001–2000 certified organisation. There are Standard Operating Procedures (SoPs) for the following disciplines:

- estimation sheet for quoting the prices for production jobs
- production planning
- quality plan
- in-process inspection report
- final inspection report
- inspection report for the materials purchased
- calibration control card
- product release note and deviation note

While various data is generated, there is no integration and analysis of cost estimates and actual costs of production of tools. Post placement tracking of trainees is not undertaken. Design of IT enabled Financial and Management Information System (FMIS) is a requirement which can be linked to a suitable reward/ incentive system.

Procurement system

Raw material suppliers are locally available. Local sources can supply good quality tool steels. Being a public institution, CTTC needs to follow the procurement guidelines laid down in the General Financial Rules (GFR) calling for quotations and decision making guided by L1 principle due to which the procurement procedures are lengthy and delay tool delivery. Rate contracts linked with official indices is one solution.

For capital goods, like other Tool-Rooms, an action plan with details of equipment and related costs is prepared in consultation with local GC members and submitted to DC MSME at the beginning of FY which upon approval is ratified by the Governing Council. However, there may be delay in

actual purchase since consultation with Integrated Financial Wing is again needed although approval by DC MSME earlier was in consultation with the Wing.

Development of a procurement manual covering the operational details on above suggestions would be beneficial to improve efficiency and effectiveness of procurement.

Networking with other Tool-Rooms, Institutions and Alumni

Networking with alumni can lead to more business and placements as many ex-trainees eventually occupy decision making positions for tool planning in the industry. There is no structured system at present and is done on a case-to-case basis.

CTTC organises interaction meetings with industry and associations like All India Rubber Industry Association, Howrah Lock Industries, The Institution of Engineers, etc. CTTC also organises meetings and seminars with machine manufacturers and software vendors, foundry men association, etc.

The training initiative can be scaled up through networking with institutions having infrastructure available with them, e.g. ITIs, polytechnics, state government, institutions, etc. IT enabled platform for such networking is essential. At present networking with other Tool-Rooms is through meetings of General Managers which take place once in a year. To share the experiences, such meetings at levels of Head of the Departments should be started. Frequency of such meetings needs to be increased.

Interaction with DC MSME

DC MSME monitors the performance. System is in place under which Tool-Room submits the following reports:

- Performance report is submitted monthly. Against annual targets, following information is submitted for the month and a cumulative round-up of the year up to the month of the report: Revenue, expenditure, order position, delivery status, machine utilisation, number of trainees, number of MSMEs assisted and explanations for short falls, if any. System brings out cost recoveries but not the impact and outreach to MSMEs. Instead of monitoring numbers it should bring out the value of assistance provided to MSMEs and highlights of the technology-related assistance cases.
- Annual action plan containing targets and funds needed during the year for recurring and non-recurring expenditure. It is prepared in consultation with local members and submitted to DC MSME who approves the same in consultation with Integrated Finance Wing of the Ministry. It is then put to the Governing Council for ratification. Role of Governing Council is limited to local members who are consulted. Ratification, later, is a formality.
- Monthly status of courts cases in which DC MSME is respondent.
- Annual Report which includes audited annual accounts for placement before the Parliament.
- Information on innovative work done. This material is used by DC MSMEs for preparation of Cabinet Note on the performance of MoMSME.
- Annual report on manpower status.

Decision making

Management of the Tool-Room is with the Governing Council. However, it meets once in a year on an average, when convened to pass Annual Accounts and Annual Report. Representatives of industry are not found to be taking interest in decision making and it is generally the officials from MoMSME and the State Government who deliberate the meetings. Members other than officials are volunteers. It is needed that the structure is revised in favour of a greater percentage of independent

members with no business relation with CTTC, e.g. representatives from universities and technology leaders. They should be paid honorarium for their services.

While expectations from CTTC are now similar to a private commercial Tool-Room, it is not allowed the same independence because it depends on Government grants even for recurring expenditure. When it starts recovering costs, it could be allowed more autonomy of a private Tool-room.

Chapter III

Organisational Assessment

This chapter assesses the current status of service portfolio, technological infrastructure, marketing strategy, finance, management systems, human resource and its impacts against the stated policy goals. This chapter also analyses different factors contributing or hindering the performance in achieving its stated objectives and policy goals of enhancing competitiveness of manufacturing MSMEs through tooling services and the availability of skilled manpower.

Overview of services

CTTC Kolkata is currently offering Tooling, Job Works and Training services, in-line with its overall stated objectives. The following services are currently being offered by the CTTC:

Table 3: Service mix of CTTC Kolkata

Production		
Tool-related services	Job work	Training ²
- Design, development and manufacture of plastic moulds, press tools, jigs & fixtures, gauges, extrusion dies, die-casting dies, forging dies and extrusion dies. - Resetting, re-sharpening & maintenance of dies & tools - Try out of tools & pilot production - Use of CAD/ CAM with the latest software and hardware - Tool-related innovation for improved product design	- Production of precision tool parts and precision machined component - Production with latest technologies like NC/ CNC & CAM - Reverse Engineering & CAD support to Industries - High-quality scale and distortion free heat treatment	Long-term courses (More than one year duration) - Diploma in tool and die making. The duration of the course is 4 years and is approved by AICTE, Govt. of India and Govt. of West Bengal. Short-term courses (six months to one year duration) - Post Diploma in CAD/ CAM - Post Diploma in Tool Design - Certificate Course in Machinist - Certificate Course in CNC Machining - Certificate Course in Auto CAD Application Short-term courses (less than six months duration) - Short-term training for workman, craftsman and Engineers

² List of training courses conducted by CTTC is laid out in Annexure II.

Production		
Tool-related services	Job work	Training ²
		• Technical training programme for persons from MSME sector, industries, institutions and for fresh degree, diploma and ITI holders • Customised training programme in CAD/ CAM, CNC Technology etc using softwares like Pro E, Unigraphics, Master CAM, Auto CAD • Seminars and Workshops in Hi-Tech Specific areas
In addition to the above, CTTC also provides consultancy to MSMEs in the field of Tool Design, and Manufacturing.		

The service sector matrix below indicates the service utilisation by respective sectors:

Table 4: Service Sector mix

Type of Service	Industry Cluster						
	Surgical instruments	Railways	Electrical	Plastic	Defence	Auto components	Scientific Research Organisation
Press tools			√		√		
Moulds			√	√			
Forging dies						√	
Die casting dies	√						
Gauges, jigs, fixtures	√				√	√	
Job work							
Components	√	√					√

Contribution

The break-up of revenue contribution (cash basis) in FY 2010-11 from various services is given in the table below:

Table 5: Break-up of revenue contribution

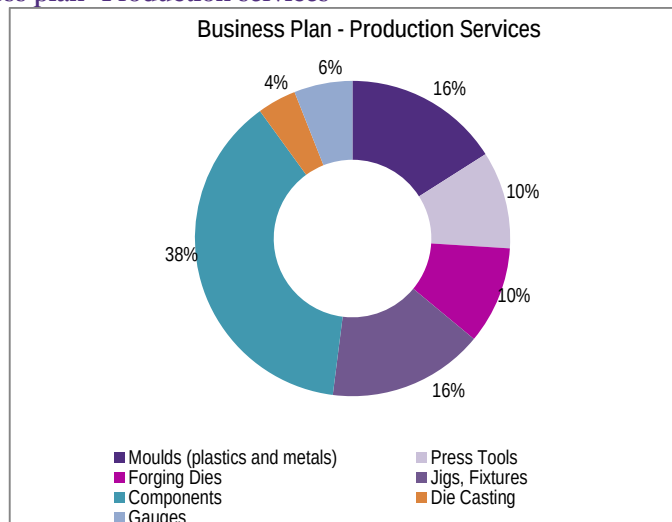
Production-related services	135.75
Training Programmes	401.40
Others (interest etc)	6.34
Total	543.49

Table 6: Sector mix of revenue from production of services (Average of 2006-2011)

Production Service	Percentage of Income
Moulds (plastics and metals)	16 %
Press Tools	10 %
Forging Dies	10%

Production Service	Percentage of Income
Jigs, Fixtures	16%
Components	38 %
Die Casting	4%
Gauges	6%

Figure 2: Business plan- Production services



The maximum revenue is generated by training services in the service mix of the CTTC, contributing more than 74% of total sales realisation in 2010-11. The contribution of income from training to total income has been steadily increasing every year, up from 19% in FY 2005-06 to 74% in FY 2010-11. This trend of falling share of production-related services must be arrested if CTTC has to serve the industry, especially MSMEs in the field of tooling. Fixing of targets in this regard as well as aggressive marketing is needed. The targets for this must indicate the share of MSMEs.

Training

The CTTC Kolkata enjoys good reputation in training with high demand for training courses. Its long-term course leading to Diploma in Tool and Die Making is certified by AICTE and recognised by Central Government and West Bengal State Government. In 2010-2011, CTTC trained 2817 persons, 675 trainees in long-term training courses and 2142 trainees in short-term training programmes. Trend from 2006-07 to 2010-2011 is given in Figure 3.

Figure 3: Admission trend from 2006-07 to 2010-2011



From 2006-07 to 2009-10, number of persons trained in long-term and short-term courses are comparable. However, in 2010-11 trainees in short-term courses trainees is approximately three times the number of trainees in long-term courses.

The students for both short-term and long-term courses (include condensed courses) are admitted from all over the country but majority (more than 90%) come from within the region.

Training income

Given below is a break-up of the training income (accrual basis) received from long-term and short-term courses. Currently, 70% of the training income comes from long-term training.

Table 7: Income from various courses

Type of Course	In Rs. in lakhs				
	2006-07	2007-08	2008-09	2009-10	2010-11
Long term	74.18	185.65	267.1	233.7	249.32
Short term	27.12	19.78	29.84	157.95	109.77

Figure 4: Training income from various courses



Scholarships and fee waiver

Scholarship is given by the State Government to SC/ ST students. Course fee is also reimbursed for SC/ST trainees by the Central Government. Central and state Governments also pay fees for courses sponsored by them under various programmes, like ESDP.

Placements

The CTTC has a 95% placement record for its long-term training programmes. For long-term courses about 70% of the total curriculum involves on the job training. Such trainees have a very good practical experience which is the reason for preference to them by the industry. Placements are not arranged by the CTTC for short-term programmes as these are mostly skill upgradation programmes. Trainees in such courses come from industry, colleges and polytechnics, and go back to them.

Post placement tracking

Information regarding entry level is available with CTTC. However, there is no system of tracking candidates post placement, and thus leveraging the alumni potential for marketing of Tool-Room services is lost.

Pricing of services

Tooling and job work

The pricing for any tooling job and production/ job work is calculated as per the following formula:
 $\text{Cost} = \text{Machine hour rates} \times \text{Number of hours on the machine}$

The Machine hour rates take into account the following components:

- Depreciation
- Direct costs
- Indirect costs
- Electricity and other consumables
- Overheads

Pricing policy is as below:

Fixed Formula: This is used for costing before quoting for plastic mould and die casting dies, considering the factors like component size, complicity tolerance of the tool and design supplied by the customer. A price calculation format using these factors has been standardised in the form of a calculation sheet. Use of this for costing helps CTTC to estimate the price and thus quote faster. CTTC, periodically, compares the price estimated by use of this short cut calculation sheet with that prepared by detailed calculations. There is not much of difference observed.

Cost Plus: For Tools, cost plus method is used. Currently HOD Marketing approves the quotation price. Fee for Diploma in Tool and Die-making is approved by the Governing Council. This course is subsidised. Fees for other long-term courses are approved by the Governing Council on actuals. Fees for short-term courses are approved by the General Manager on cost plus basis.

Marketing

System

Senior Manager Production is also in-charge of the Marketing and Consultancy department. He is assisted by a Training Officer who now works full time for marketing and consultancy. Training programmes are marketed by training team headed by a Senior Manager. Each team is given annual targets which are communicated to the GC as well as DC MSME office. The progress is reviewed on a monthly basis.

Strategy

Key marketing strategy of CTTC includes visits to regular and prospective customers and participation in exhibitions. It also includes online marketing through email and website³ for production services and newspaper advertisement, as well as networking with engineering colleges & industry associations for training services.

Constraints

Key challenge faced by CTTC in marketing of its production services is higher cost for simple tools, lack of speed, absence of strategy based on proper market need assessment and segmentation.

Client profile

CTTC Kolkata clientele for production services is mainly from West Bengal which forms 95% of its customers. Given the profile of the industry in Kolkata and adjoining states, the maximum demand of tooling is for moulds, jigs, fixtures and gauges, press tools, forging dies and foundry patterns. There is also demand for components from vendors of railway equipment and defence. During last five years, share of tooling and components in production services is 62% and 38%, respectively. This is a good trend, provided production in absolute terms is augmented commensurate with equipment and personnel.

At the national level, plastic moulds have a share of about 37% of total tooling demand and are expected to grow at a CAGR of 17%. The CTTC has developed expertise in plastic moulds, which constitute 8% (last five year average) of CTTC production revenue. CTTC has also developed expertise in press tools and jigs & fixtures.

The main sectors that CTTC is serving are railway, constituting 33%, followed by defence sector contributing 24% and plastics, rubber and glass industry together contributing 16% to industry mix. The break up for spread of products for the last five years is given in the table below:

Table 8: Spread of products, percentages based on values

Particulars	2006-07	2007-08	2008-09	2009-10	2010-11
Moulds for plastics, metal	20	12	16	18	16
Press Tools	8	13	10	12	10
Forging Dies, Foundry Patterns	12	8	20	10	14
Jigs, Fixtures& Gauges	24	32	16	20	22
Components	36	35	38	40	38

³ <http://www.msmetoolroomkolkata.com>.

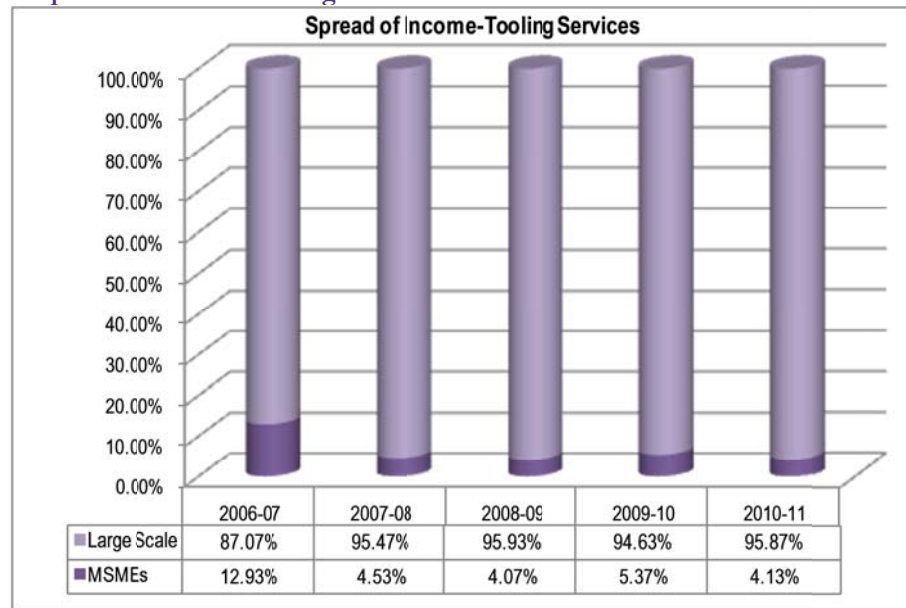
Types of industries served – MSMEs assisted

The share of MSME customers of CTTC has gradually increased from 41% to 46%. However, in terms of the value, MSME's share has declined from 12.93% to 4.13%. The table below provides trends on the share of MSME customers to total customers of CTTC:

Table 9: Industry break up

Type of Industry	2006-07	2007-08	2008-09	2009-10	2010-11
MSMEs	41%	38%	38%	44%	46%
Others/Large Scale	59%	62%	62%	56%	54%

Figure 5: Spread of income: tooling services

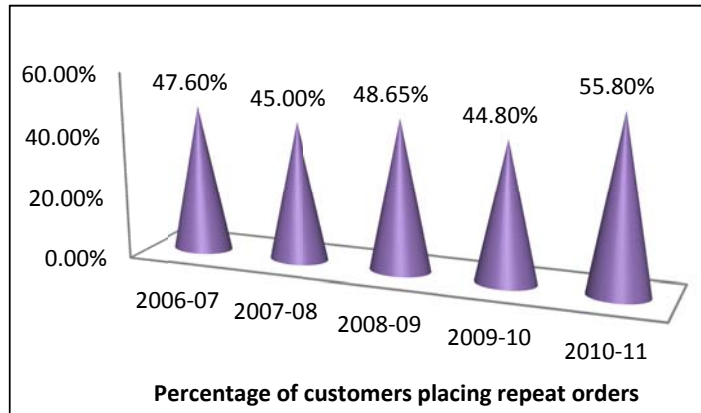


From the Table 9 and Figure 5, it is clearly visible that Tool Room's decision for tooling services is driven towards generating revenue reflected in higher share of services provided to large scale enterprises than supporting MSMEs as a policy objective. The focus on revenue generation is aggravated by the fact that there is a declining trend from 2006-07 to 2010-11 in MSMEs share in Tool Room's revenues through tooling services.

Proportion of repeat orders

CTTC is doing well on customer satisfaction and retention as percentage of repeat orders is on an average 48.37% for the last five years. Further, it has increased to 55.80% in 2010-11. Trend is shown in Figure 6.

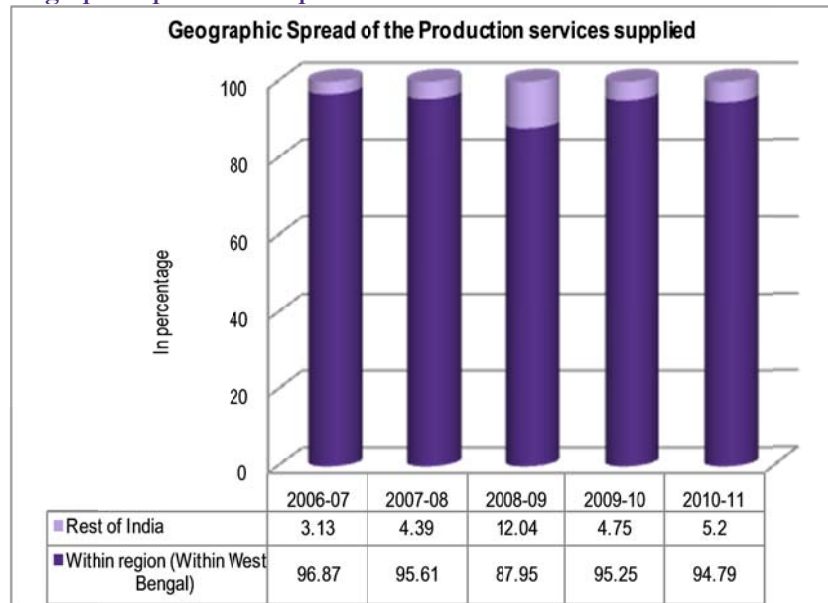
Figure 6: Repeat customers



Geographic spread of the clients for tooling services

As indicated in the chart below, majority of the customers of the CTTC are from West Bengal. It does not have to go far to sell its products and assist the industry in the region. Trend is shown in Figure 7.

Figure 7: Geographic spread of the production services



Physical and technical infrastructure

Physical infrastructure

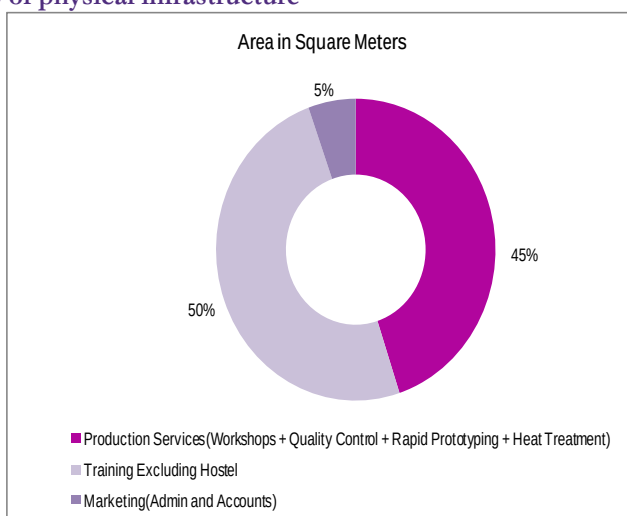
The CTTC is a well-equipped public commercial Tool-Room in the Eastern Region. The total built up area of CTTC is 19,210 square meters. The built up areas for the various departments is given in Table 10 and Figure 8.

Table 10: Facility break-up

Facility	Area in Square Meters
Production Services(Workshops + Quality Control + Rapid Prototyping + Heat Treatment)	8625.00
Training Excluding Hostel	9525.00
Marketing(Admin and Accounts)	1060.00
Total	19210.00

This includes a hostel with capacity of 94 within the complex.

Figure 8: Break up of physical infrastructure



Utilities

As regards utilities, CTTC has an electrical sub-station, an air conditioning plant, submersible pump and tank for water supply. CTTC has power back up which can feed all the critical equipment in case of power cut. They have the following DG sets:

Table 11: Power back up

Capacity	Flexibility for use
Connected Load	650 KVA
200 KVA DG Set	The system is flexible. It can feed important machines, as selected by the Management.

Local sources for other utilities are adequate.

Equipment in production-related services sections

CTTC was equipped with high-tech equipment needed at that time. Subsequently, the Plant and Machinery has been augmented and upgraded from time-to-time⁴.

Appropriateness of technology

The equipment available at CTTC, if in working order, has the capacity to meet majority demands with respect to accuracy, complexity and physical size of tools. However, maintenance is not satisfactory. Of the 15 high-value machines which the management considers critical for its operations, seven are under breakdown, some for more than 3 years. All the 4-axes and 5-axes machines are under breakdown. Possibly some of these are now beyond economic repairs. Looking at the quantum of the problem it cannot be addressed in routine by the Management. An organised study by a team of specialists is needed to examine and recommend repair or replacement of the machines, based on economic considerations to restore the working capacity of the Tool-Room. Spares for the machines older than 15 years could be difficult to get. All of these machines are of European or US origin and those machinery manufacturers are legally obliged to supply spares only up to 15 years from its purchase, however, many still do.

Discussion with representatives of tool and gauge manufacturers and representatives of the industry using the facilities at CTTC indicate that with manufacturing industry growing at fast rates, particularly the automobile and auto component industry, the demand for more accurate tooling involving more complex shapes and faster deliveries (due to frequent change of models) is growing. If CTTC does not have the appropriate equipment and technology to meet the future demands of the industry and also work as a demonstration centre for such technology for industry to adopt, it would lose its objectives to assist the industry in general, and MSMEs in particular.

Equipment in the training department

Training Department is well equipped to impart practical training with high pedagogical values for its training programmes. In addition to conventional milling machines, lathes, shapers, surface grinders, cylindrical grinders, tool and cutter grinders it has the following equipment:

- CNC milling machines
- CNC lathes
- VLSI lab
- Hardware and networking lab
- 68 computers for CAD/ CAM training programmes
- A wide range of CAD/ CAM software⁵

Total value of training equipment is given in the table below:

Table 12: Value of Training Equipment

As on	31.3.2006	31.3.2007	31.3.2008	31.3.2009	31.3.2010	31.3.2011
Value of Training Equipment in Rupees lakhs	636.56	752.68	705.29	764.76	738.64	768.01

⁴ List of equipment is in Annexure III.

⁵ List of equipment in CAD/ CAM software in Training Department is given in Annexure IV.

Design Development

The Design department plays an important role in the success of a Tool-Room. Its services include Product Design and Tool Design before the tools are taken up for production. But, at present, there is only one Engineer in design department and one casual contract employee. It, therefore, cannot provide effective support in design and development. It has necessary hardware and software but not personnel. CTTC should develop necessary expertise in it by recruiting or diverting existing employees and training them.

Human Resources

In addition to the General Manager, who is the Chief Executive, and his Private Secretary, CTTC has manpower strength of 70 as tabulated below:

Table 13: Personnel

Department / Designation	Senior Manager	Manager	Assistant Manager	Engineer/ Admin officer/ Accountant/ Officer	Junior Officer	Technicians	Others
Administration		*		1			21
Training	1			3	4		
Marketing							
Tool Production/Component Production	1	1	3	2		27	
Design				1			
Accounts				1			
Sub Total	2	1	3	8	4	27	25
Total	70 (72 including General Manager & his Private Secretary)						

*Secretary who is at the same level as Manager. The post has recently fallen vacant when the incumbent has been removed from service on disciplinary grounds

Vacancies

CTTC has 9 posts which are vacant. As mentioned above, CTTC needs to fill some higher posts and keep lower ones vacant with the point of view of career progression and motivation of employees.

Skill up-gradation/capacity building need

Skill and knowledge development programmes are needed for existing employees. Apart from acquiring new skills and knowledge such programmes affect employee motivation. There has not been any systematic attempt in this direction.

Operational efficiency

Lead time and quality

While quality is good, price level and lead times are high. In any case tooling activity, in absolute terms is less. Of the capacity available, hours available on each machine should be tracked. Hours

booked, time taken by operators, time spent in remaking or salvaging rejections should also be kept track of. The analysis of such data requires an IT based FMIS which is needed at CTTC.

All stakeholders like industry associations, user industries and members of the Governing Council representing industry, as well as Director MSME Development Institute, highlighted that while the quality of tools from CTTC is good, CTTC price is very high and the delivery time a bit too long. Micro and small units find CTTC prices unaffordable. This is an issue which needs to be addressed in order to help MSMEs regain their confidence in the institute. Higher capacity utilisation by working three shifts would bring down the prices as over heads would be more evenly spread.

Machine utilisation

Utilisation data for 15 critical machines at CTTC in production-related services was examined. Seven of these are under breakdown for long periods. One was commissioned only in December 2010 and therefore worked only 25% of the time in 2010-11. Ideally critical machines should be used round the clock. Since Tool-Room operations are non-repetitive and all tool parts need different routing and scheduling, the aim should be to achieve 85% utilisation of capacity calculated on this basis. CTTC's position with regard to utilisation of these critical machines is as below which indicates that there is a significant scope for improvement. Presently, capacity is grossly under-utilised.

Table 14: Machine utilisation

Description		Number of hours
Installed capacity ⁶ , 3 shifts, all machines, industry norm	A	97128
Installed capacity, 3 shifts, minus break down machines	B	49416
Installed capacity, 2 shifts, all machines	C	64752
Installed capacity, 2 shifts, minus break down machines	D	32944
Machine hours utilised	E	19243
Capacity utilisation considering all machines, 3 shifts	E/A	20%
Capacity utilisation considering all machines 2 shifts	E/C	30%
Utilisation of capacity, minus break down m/cs, 3 shifts	E/B	39%
Utilisation of capacity, minus break down m/cs, 2 shifts	E/D	58%

Capacity utilisation is thus low and therefore, needs to be addressed.

As indicated above breakdown of machines is high, 7 of 15 critical and high-value machines are under breakdown.

Financial analysis

⁶ Calculation of installed capacity:

Days in a year	=	365
Less Sundays	=	(52)
Less Second Saturdays	=	(12)
Holidays	=	(17)
Net working days	=	284
Number of Hours on 24x7 basis (284x24)	=	6816
per machine		
Number of hours on 24 hours basis, 284	=	97128
X24x14 + 284X24X1X0.25		
Same as above but 8 machines(i.e. minus 7 m/cs under breakdown)	=	49416
Same as above but 2 shifts, 15 m/cs	=	64752
Same as above but 2 shifts, 8 m/cs	=	32944

Analysis of the performance data has been done for the last five financial years from the CTTC's Annual Reports made available for the following indicators:

- Net worth
- Profitability analysis
- Trend of income and expenditure

Net worth

The net worth of an enterprise is the sum of total equity and retained earnings. Net worth reflects the value of the enterprise, considering it is composed primarily of the money that has been invested in the enterprise since its inception, as well as the retained earnings for the duration of its operation.

Table 15: Net worth

Particulars	2005 - 06	2006 - 07	2007 - 08	2008 - 09	2009 -10
Net worth	181,124,679	185,296,170	203,177,559	211,500,131	217,205,215
Year on year increase		2%	10%	4%	3%

The net worth of CTTC, Kolkata has been increasing every year by an average of 5%, which is a healthy sign as it implies an increase in equity or value of the Tool-Room. During the years the Tool-Room was also in receipt of Government grants.

Table 16 gives the trend of Government grants being received by CTTC, Kolkata:

Table 16: Government grants

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10
Contribution from GOI	15,376,747	19,422,193	23,600,574	23,238,647	19,922,084

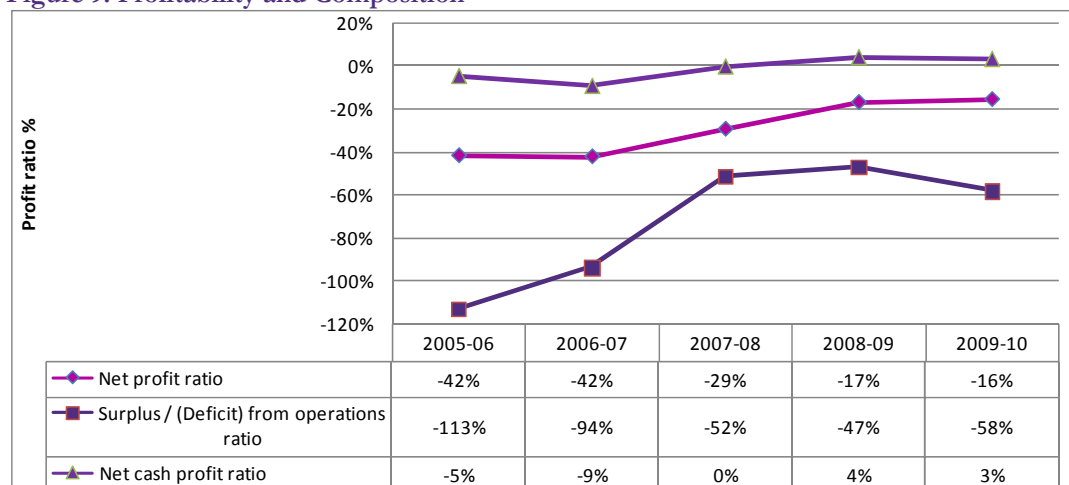
Net worth of the Tool-Room excluding the Government grants received is provided in the Table 17.

Table 17: Net worth without Government grants

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10
Net worth excluding government grants	165,747,932	150,497,230	144,778,045	129,861,970	115,644,970
Year-on-year increase		-9%	-4%	-10%	-11%

The Net worth of the Tool-Room has been declining without Government grants. The revenues are not able to recover the costs and it is evident that the Tool-Room is in need of aid from the Government to sustain its operations.

Figure 9: Profitability and Composition



The Tool-Room has been generating deficit every year from FY 2005-2010. The same has although been decreasing every year. From FY 2005-06, the deficit has gone down from 42% to 16% in FY 2009-10.

The deficit from operations is significant. This implies that the Tool-Room's operations are not very profitable. A major portion of the deficit is being financed by other income, of which a major component is Government grants.

Although the Tool-Room was in a cash deficit situation till FY 2006-07, it reached breakeven in 2007-08 and has been in a cash surplus situation since.

In FY 2005-06, the primary source of revenue was from sale of goods and services which alone accounted for half of the total revenue at 48%. The income from training was only 19%. A major source of revenue was income from other sources which comprised interest income and grant in aid received from the Government.

Gradually share of income from training increased to 27% in FY 2006-07, 47% in FY 2007-08, 53% in FY 2008-09 and 58% in FY 2009-10. Along with that the share of income from the sale of goods declined to 33% in FY 2006-07, 35% in FY 2007-08, 25% in FY 2008-09 and 14% in FY 2009-10. The contribution of other incomes has been ad-hoc, based on grants received from the Government which have averaged around Rs.100 lakhs in the five years during FY 2005-10.

The share of salary costs in total expenses has increased over the years. In FY 2005-06, the salary costs accounted for 48% of the total expense whereas in FY 2009-10 the salary costs accounted for 61% of the total expense. On the other hand, the share of depreciation has gone down from 26% in FY 2005-06 to a mere 16% in FY 2009-10. Other administrative expenses have not seen much change in their contribution to the total expense and have averaged around 27% of the total expense during the period.

Trend of income and expenditure

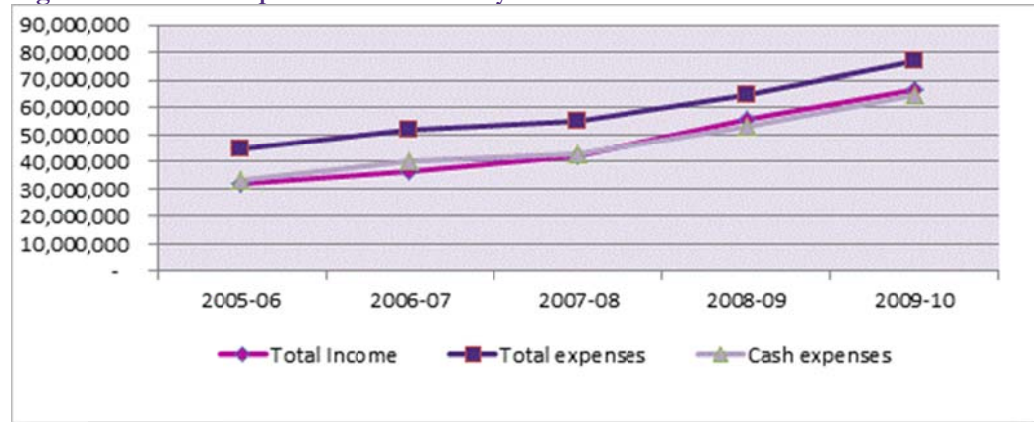
Grant Thornton did a trend analysis of the income and expenditure of CTTC, Kolkata based on the audited financial statements provided for the five years ended March 31, 2010.

Given below is a diagram reflecting the relationship between the income, expenses and cash expenses:

Table 18: Income-expenditure trend analysis

Particulars	2005 - 06	2006 - 07	2007 - 08	2008 - 09	2009 -10
Total income	37,727,922	44,610,290	47,288,557	58,593,675	68,907,798
Total expenses	45,054,546	52,089,670	54,948,917	64,784,739	77,167,566
Cash expenses	33,247,874	39,956,788	42,590,372	53,183,099	64,658,146

Figure 10: Income-expenditure trend analysis



The total expenses have been in excess of the total income and thus the Tool-Room has been incurring a deficit. The operations of the Tool-Room are being sustained from the grants received from the Government.

The expenses have increased at an average of 15% whereas the income from operations is increasing at an average of 23%.

The biggest increase in income has been in the training income which has grown at a significant rate of 62% over the years, whereas the income from sales of goods and services has been reducing at an average rate of 10%. This shows that the Tool-Room has concentrated more on training programmes and the production of goods and provision of services.

The biggest increase in the expenses has been in salary costs which increased significantly in FY 2008-09 onwards on account of the recommendation of the Sixth Pay Commission. Average rate of increase in salary costs is 23%. On the other hand, other administrative expenses have been increasing at an average rate of 12%.

However, the Tool-Room, which was incurring a cash deficit earlier, reached breakeven in FY 2007-08 and has been cash positive since then.

Chapter IV

Overview of Local Business Environment from Tool-Room perspective

This chapter assesses the location of the Tool-Room with regard to market potential, availability of raw material and machinery. Although Tool-Room has no control over these factors but they do affect it's working.

Location and market potential

Central Tool-Room and Training Centre is located in the Bonhoogly Industrial Area in Kolkata in the state of West Bengal. Although there are no industrial users of CTTC services in the surrounding area, there is huge concentration of user industry in Kolkata and adjoining cities. It, thus, has a strategic advantage from its location. Industrial growth in the state is now picking up. Industry in Kolkata, Howrah, Baruipur, Kharagpur and Haldia need plastic moulds. Plastic industry is growing at a CAGR of 12% at national level and so will be the demand for plastic moulds. There is also demand for precision components by defence units nearby and railway equipment manufacturers. CTTC can meet this demand but, in the process, it should not sacrifice moulds and other tooling. It should, as a policy, decide that substantial share of their production services would be tools and tool parts.

The supplier chain

Raw material suppliers

Kolkata has presence of importers and stockists of imported tool steels, standard mould & dies sets and their components. Better stocks are available in Mumbai and Chennai. Kolkata stockists have contacts with them. If materials needed by CTTC are available with Kolkata stockists, the deliveries are prompt, within three / four days, and for the others within a fortnight of order confirmation⁷. This enables CTTC Kolkata to procure its requirement without any delay after an order is placed.

Machinery suppliers

Machinery suppliers both conventional and precision machines have agents/ representatives based in Kolkata which offer an advantage of prompt servicing and attending to breakdowns.

⁷source: discussion with suppliers in Kolkata

Summary of backward linkages:

Table 19: Backward linkages

Input	Linkage/ Sources
Raw Materials	Stockists in Kolkata, Mumbai and Chennai. Agents and importers in Mumbai and Chennai.
Machine Tools	Manufacturers for indigenous machines. Direct imports for imported machines, nearly all such suppliers have agents in India for liaison and service back up. Some imported machines are also available on rupee payment from agents in India.
Standard Moulds and Die sets	Stockists/traders in Kolkata, Mumbai, Chennai.
Cutting Tools	Manufacturers and stockists sufficiently present in Kolkata
Consumables like oils, greases, salts	Stockists in Kolkata
Spares	From OEMs except for standard spares like bearings
Specialised Maintenance/ Servicing of CNC Machines	By the machinery suppliers. In case of imported machines this is provided by agents of the foreign suppliers through Annual Maintenance Contracts or visit basis. Agents of a few foreign principals/ suppliers have their branch offices or liaison offices in Kolkata which is an advantage for close liaison. Problem with a large number of such machines under breakdown appears to be internal.

Growth and presence of private commercial Tool-Rooms

There are a large number of private commercial Tool-Rooms in Kolkata and Howrah. Most of the commercial Tool-Rooms are small and lack modern technologies like advanced CNC machining, rapid prototyping. CTTC has these facilities. Private commercial tool making must be encouraged. CTTC should act as a catalyst to assist them to expand their operations. Kolkata has easy availability of raw materials, standard die sets and consumables. CTTC should support them in the following areas:

- Design and development of products and tools
- Development of prototypes
- Making tool parts for which commercial Tool-Rooms do not have the facilities
- Assistance in programming of CNC machines to the extent available with these Tool-Rooms
- Assistance in selection of new equipment

Chapter V

Inclusive Growth underlined by Social Impact

The CTTC has made an impact in training, to some extent in tooling and in dissemination of environment-friendly technologies to MSMEs.

The CTTC trains more than 2800 persons per annum under various training programmes generating employment.

Exhibiting the usage of environmentally friendly technology, it introduced vacuum heat treatment technology replacing conventional salt baths which produce toxins and are hazardous to health. This technology should be propagated as it is pollution free and also has the technological advantage of producing heat treated parts with almost no scale and minimal distortion. However, vacuum heat treatment equipment with which CTTC introduced cleaner technology is under breakdown for the last 3 years. It must be repaired and put to intended use.

However, the impact in terms of the development of MSMEs and human resources for the industry is rather limited and scaling up has not been undertaken. The number of trainees is marginal in comparison to the national demand. Auto component industry alone needs additional manpower of more than 35 million over next 10 years.

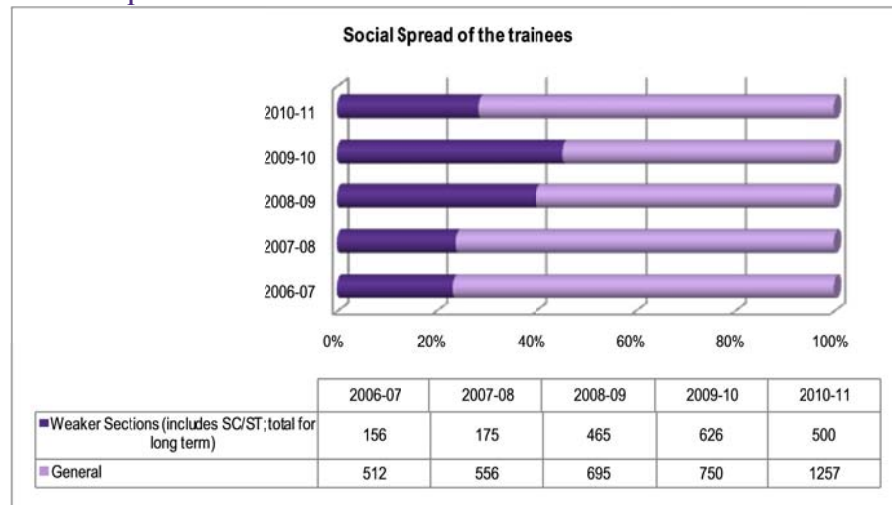
CTTC has also contributed to scientific research by machining complex parts for scientific research organisations. To enhance its outreach, CTTC intends to add the assistance provided by it in doing very intricate machining work of experimental nature for Scientific Research Organizations like;

- (i) Variable Energy Cyclotron Centre, Deptt. of Atomic Energy, Govt of India.
- (ii) S. N. Bose National Centre for Basic Sciences.
- (iii) Deptt. of Radio Physics & Electronics, University of Calcutta.
- (iv) Deptt. of Polymer Science & Technology, University of Calcutta.
- (v) Jadavpur University.
- (vi) IIT, Kharagpur.

Social spread of trainees

The CTTC has had a balanced spread in terms of training to general category students and weaker sections as reflected in Figure 11.

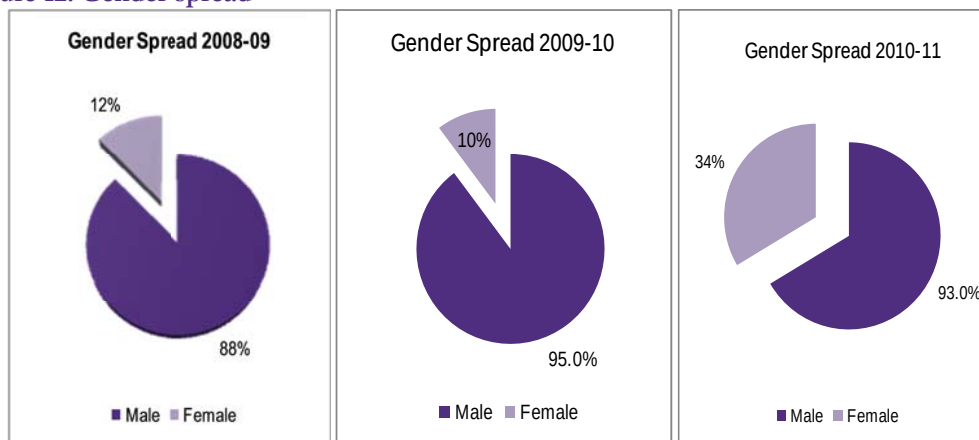
Figure 11: Social spread of the trainees



Gender spread

Given below is the gender spread in long and short-term training courses at CTTC for the last three years. Keeping in view that most of the training courses run by CTTC are for the industries where women participation is less, representation of women in its training programmes is good. No special incentive is provided to encourage women to participate in the trainings. While percentage fluctuates from year-to-year, in 2010-11, 34% trainees were women.

Figure 12: Gender spread



SWOT

Strengths

- It is a well equipped commercial Tool-Room in the eastern region.
- It is set up with development objectives and offers its services without commercial objectives.
- It is reputed for the quality of training services.
- It has good training expertise and equipment.
- It has developed specialisation in production of precision components.

Weaknesses

- Tool design skills are weak.
- Seven out of fifteen critical machines are under breakdown for long periods.
- Low level of utilisation of installed capacity
- High price level
- Inadequate motivation of core management team as well as staff
- Lack of performance-based incentive schemes to motivate employees
- Limited use of Financial and Management Information systems
- Depleting understanding of the local market and MSME needs

Opportunities

- Good reputation as a vocational training institute.
- Significant scope for scaling up training and tooling services given the favourable market conditions.
- The national tooling demand is Rs.13225 crore.
- Huge national requirement for trained manpower.
- Government support for capital investment is available.
- Raw material suppliers are locally available who can supply tool steel from reputed manufacturers from all over the world.

Threats

- Monitoring based on indicators of self sustainability has diluted impact on MSMEs and job creation.
- Easy procedures and low customs duties for import of tools. TAGMA's latest survey indicates that more than 30 % tooling is imported in the country.
- Low price levels and faster deliveries of tools from some countries, especially China and Taiwan.
- MSMEs prefer low costs of tools compared to high cost tooling services provided by CTTC.

Conclusion

CTTC has made significant impact in the past in creating skilled manpower, producing precision tooling and disseminating new technologies. Today tooling services stand diluted. However, sustaining and scaling up the impact is imperative. This would be a major challenge given constraints like breakdown of important machines, lack of acquisition of new skills by the available human resource, deteriorating linkages with local MSME market, limited networking skills, low level use of modern financial and management systems, limited managerial skills, etc.

On financial recovery side, CTTC Kolkata was the first of the 10 Tool-Rooms to have recovered costs without depreciation but is not able to do so today.

The policy direction and monitoring indicators mainly give weightage to self-sustainability which needs to be revisited as the impact on MSMEs is of equal significance. Over emphasis on cost recovery and related financial indicators has resulted in reduced impact on the assistance to MSMEs for tooling services. Concentration is shifting towards component production. On training side, 75% of the fees realised is from the Government under one scheme or the other. This is risky. If Government withdraws support to these schemes as a change of policy, it would be difficult to fill the gap at short notice.

It is also necessary that the CTTC develops an understanding of the current and emerging MSME needs, both on training and tooling fronts. A formal survey of the MSME market, relevant to the CTTC, is needed in this respect. This would be essential to establish short- and long-term targets with an eye on the impact.

Annexure I

Details of Visit

Details of visit of GT Team to CTTC Kolkata

Details of Organisation	Names of persons met	Designation
MSME Central Tool Room & Training Centre, Kolkata	Shri M.Kuruppasamy	General Manager
	Shri A.K.Samanta	Senior Manager, Production
	Shri A.K.Das	Senior Manager, Training
	Shri A.K.nandi	Training Officer posted to Marketing and Consultancy
	Shri A.K.Chanda	Admin. Officer
	Shri S.K. Ghosh	Consultant, Accounts
MSME-Development Institute	N.N. Debnath	Director
BMC Electroplast PVT.LTD.	Atanu Chanda	Senior Executive
Conhyde India Private Ltd	Shri Alok Ghosh	Director
Indian Plastic Federation	Shri Sourabh Khemani	President (Member GC, CTTC)

Annexure II

Training Courses

Course	Duration	Fee/student	Support from Ministry of MSME/Others (State etc.)	Intake	Selection Criterion	Certification by	Typical job on placement	Entry Level Salary and Growth
Long Term								
DTDM	4 Years	1.2 lakhs	MSME	100	Entrance	CTTC, Kolkata	Operator/Supervisor In Engg. Industry.	8.00 K
AMC-Jharkhand	2 Years	1.05 lakhs	Govt. of Jharkhand	100	Jharkhand sponsored	CTTC, Kolkata	Operator in Engg. Industry.	4.50 K
AMC, WB	2 Years	0.92 lakhs	GOWB sponsored	100	WB sponsored	CTTC, Kolkata	Operator in Engg. Industry.	4.50 K
AMC, Aliah University	2 Years	0.60 lakhs	Aliah Univ. sponsored	50	Aliah sponsored	CTTC, Kolkata	Operator in Engg. Industry.	4.5 K
AMC, DONER	2 Years	1.20 lakhs	GOVT. OF INDIA, Min. of DONER		North East Council sponsored	CTTC, Kolkata		
CCTM	2 years	0.12 lakhs		20	Open	CTTC, Kolkata	Operator in Engg. Industry.	4.00 K

Course	Duration	Fee/student	Support from Ministry of MSME/Others (State etc.)	Intake	Selection Criterion	Certification by	Typical job placement	Entry Level Salary and Growth
Short Term								
Certificate in Adv. Mach.Course	1 Year	20.0 K		20	Open	CTTC, Kolkata		
Post Dip. Tool Design & Mfg.(CAD/CAM)	1 Year	40.0 K		20	Open	CTTC, Kolkata		
Certificate Course Compressed Tool and Die	1 Year	20.0 K		20	Open	CTTC, Kolkata		
Master CAD/CAM	6 months	24.0 K		10	Open	CTTC, Kolkata		
Adv.Dip. in CNC Prog. & Practice	6 months	20.0 K		20	Open	CTTC, Kolkata		
Auto CAD	4 Weeks	5.0 K		20	Open	CTTC, Kolkata		
Solid Works	4 Weeks	5.5 K		20	Open	CTTC, Kolkata		
PRO-E	4 Weeks	7.0 K		20	Open	CTTC, Kolkata		
CATIA	4 Weeks	8.0 K		20	Open	CTTC, Kolkata		
Unigraphics	4 Weeks	7.0 K		20	Open	CTTC, Kolkata		
CNC Mach.Practice	8 Weeks	12.5 K		20	Open	CTTC, Kolkata		
Computer Hardware &	4 Weeks	5.0 K		20	Open	CTTC, Kolkata		

Course	Duration	Fee/student	Support from Ministry of MSME/Others (State etc.)	Intake	Selection Criterion	Certification by	Typical job on placement	Entry Level Salary and Growth
Networking								
VLSI	4 Weeks	6.0 K		20	Open	CTTC, Kolkata		
PLC	4 Weeks	6.5 K		20	Open	CTTC, Kolkata		

Annexure III

Production Equipment

CNC Mac hines	Type	Make/Model & Serial No	AXES TRAVEL mm	Max Job Wt / Specific ations	Axes	Accurac y mm	Year of Installation		Number of hours utilised		
								2010-11	2009-10	2008-09	2007-08
1	CNC milling	BFW/BMV70	1500X800X800	1200	3	0.005	13thDec 2010	1222			
2	CNC milling	HAAS/VF9	2000X1000X930	1600	3	0.02	2004	3974	4100	3900	3360
3	cnc milling	DECKEL MAHO/DMC- 60U	600X700X550	600	5	0.015	1999		breakdow n	Dec-07	500
4	HEAT TREAT.	VFS - 10		200			1996		breakdow n	Dec-08	
5	CNC milling	SACHMAN	1200X1000X675	1500	3	0.1	1996	4052	4560	3500	3275
6	Cnc WIRE CUT	AGIE 200	400X250X250	400	3 and UV	0.01	1986	1458	1200	800	1375
7	CNC EDM	AGIETRON 1U	250X160X250	200	4	0.01	1992		BREAK DOWN		Sep-07
8	CNC EDM	AGIE COMPACT	250X160X250	200	3	0.01	1996	389	350	300	420

CNC Mac hines	Type	Make/Model & Serial No	AXES TRAVEL mm	Max Job Wt / Specific ations	Axes	Accurac y mm	Year of Installation		Number of hours utilised		
								2010-11	2009-10	2008-09	2007-08
		1									
9	CNC milling	MIKRON WF21D	450X400X400	400	4	0.04	1992		BREAK DOWN		Sep-07
10	CNC milling	MIKRON WF21D1	450X400X400	400	3	0.02	1991	3400	3168	2800	2690
11	CNC milling	MIKRON WF51C	800X500X400	600	3	0.06	1992		BREAK DOWN		Sep-07
12	CNC EDM	Deckle DE25C	500X350X350	1000	4	0.01	1991		BREAK DOWN		before20 07
13	CNC WIRE CUT	SPRINT-20	300X200X224	300	3and UV	0.01	1996		BREAK DOWN		Sep-07
14	CNC Turning	IKEGAI	dia400x700	150	2	0.01	1996	1452	1320	545	700
15	CLY grinding(con)	STUDER	DIA350x500	150	2	0.002	2006	1296	1000	1150	960

Annexure IV

CAD/CAM Software in Training Equipment

CAM	Package	Licenses (Description)	Vendor	Qty.	Version
Del.CAM-TM	-	5	Delcam India Pvt. Ltd.	5	2011
Pr0-E	2	50	Rolta India Ltd	100	Wildfive-4
Unigraphics	-	5	Variant Design & Technology	5	NX-6
CATIA	1	25	CSM Software Pvt. Ltd.		V-5, R-20
Auto CAD	-	30	KLK Systel	30	2010
Solid Works	2	15	Comprehensive Consultancy Pvt. Ltd.	30	2011
Del CAM-PS		5	Delcam India Pvt. Ltd.	5	2011
Pro-E	2	50	Rolta India Ltd	100	Wildfive-4
Unigraphics		5	Variant Design Technology	5	N x 6
CATIA	1	25	CSM Software Pvt. Ltd.	25	V-5, R- 20



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Strategic Assessment of MSME Tool Rooms

As Is Assessment Report – CTR Ludhiana

Prepared for

Micro, Small and Medium Enterprises
Umbrella Programme

giz Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH



Knowledge Partner:



Grant Thornton

Contents

	Page
Abbreviations used	5
Executive Summary	7
Introduction	10
Chapter I Organisational Profile	12
Chapter II Governance, Management Systems and Processes	14
Chapter III Organisational Assessment	18
Chapter IV Overview of local Business Environment from Tool Room perspective	33
Chapter V Inclusive Growth underlined by Social Impact	35
SWOT	37
Conclusion	37
Annexure I Details of Visit	39
Annexure II Training Courses	40
Annexure III Production Equipment	42
Annexure IV Training Equipment	44
Annexure V Training organised for CTR employees	51

Table 1: CTR Profile	12
Table 2: Annual Targets.....	15
Table 3: Service Mix of CTR Ludhiana.....	18
Table 4: Service-Sector Mix	19
Table 5: Break-up of Revenue Contribution.....	19
Table 6: Income from various courses.....	20
Table 7: Spread of products, percentages based on values	23
Table 8: Industry Break-up	23
Table 9: Facility Break-up.....	25
Table 10: Power Back up.....	26
Table 11: Personnel.....	28
Table 12: Retention Pattern	29
Table 13: Machine Utilisation.....	30
Table 14: Machine Breakdown	30
Table 15: Net Worth	31
Table 16: Government Grants	31
Table 17: Networth without Government Grants.....	31
Table 18: Income-Expenditure Trend Analysis.....	32
Table 19: Backward Linkages ³	33
Figure 1: Share of Services	19
Figure 2: Number of Trainees trained.....	20
Figure 3: Training Income from Various Courses	21
Figure 4: Spread of Income: Tooling Services.....	24
Figure 5: Percentage of Repeat Orders 2010-11.....	24
Figure 6: Geographic Spread of the Production Services	25
Figure 7: Break up of Physical Infrastructure	26
Figure 8: Profitability	31
Figure 9: Income-Expenditure Trend Analysis	32
Figure 10: Social Spread of the trainees	36
Figure 11: Gender Spread	36

Abbreviations used

AICTE	All India Council of Technical Education
CAGR	Compound Annual Growth Rate
CTR	Central Tool Room
CAD	Computer Aided Design
CNC	Computer Numerical Control
CAM	Computer Aided Manufacturing
D	Dimensional
DC	Development Commissioner
DG	Diesel Generating
EDM	Electric Discharge Machining
ESPD	Entrepreneurship & Skill Development Programme
FMIS	Financial & Management Information System
FY	Financial Year
GFR	General Financial Regulations
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GOI	Government of India
HOD	Head of Department
HRD	Human Resource Development
HT	Heat Treatment
ISO	International Standards Organisation
IT	Information Technology
ITI	Industrial Training Institute
IMTEX	Indian Metal-Cutting Machine Tool Exhibition
IITF	India International Trade Fair
L 1	First Lowest
M/C	Machine
MIS	Management Information System
MoMSME	Ministry of Micro, Small and Medium Enterprises
MSME	Micro, Small and Medium Enterprises
NTTF	Nettur Technical Training Foundation
OEM	Original Equipment Manufacturers
PG	Post Graduate
PSBTE	Punjab State Board of Technical Education
SOP	Standard Operating Procedure

Executive Summary

Central Tool Room at Ludhiana is the oldest of the four set up under Indo-German Technical Co-operation Tool Room Programme, for design and manufacture of tools and training of manpower in employable skills in tool making and allied trades. It is operating as Government of India Society under Chairmanship of DC MSME since 1980. During the collaboration period total investment in the project was Rs.47.32 crores of which Governments of India and Germany contributed Rs.32.82 crores and Rs.14.50 crores, respectively. State of the art Tool Room equipment is installed at CTR which includes high end tool machines like jig boring & jig grinding CNC machining centres, CMMs, SLS rapid prototyping system and salt bath furnaces. CTR has manpower of 118.

CTR's revenue has increased at an average rate of 16% over the last 5 years. Cash expenses during the same period increased at 14 %, signifying that the gap between income and expenditure continued narrowing down although it was still negative until 2009-10 when the revenue was Rs.6.07 crores and expenditure Rs.6.99 crores. Government grant-in-aid of Rs.8,20,700 was given to meet recurring expenses. Main constituent of expenditure is salary which forms 65% of expenditure. On recovery account, training is doing better. It contributes 48 % to revenue with less than 20% of employees (excluding administration which is common). Share of MSMEs in production related services was 56% in 2009-10 and 64% in 2010-11. In 2010 – 11, CTR trained 1950 trainees in its programmes.

CTR's operating income and expenditure without depreciation in recent years was as below:

Year	2005-06	2006-07	2007-08	2008-09	2009-10
Income	377.28	446.10	472.89	585.94	689.08
Recurring Expenditure	425.70	438.18	451.49	603.74	699.23
Income minus expenditure	(-)48.42	7.93	21.39	(-)17.81	(-)10.15

CTR has maximum number of employees, 118, amongst all Tool Rooms. More than 70 are with Tool Room for more than 15 years which makes the salary bill high to due annual increments. Creating avenues of motivation, they can be utilized on production work to increase revenue as has been demonstrated by training generating nearly half the revenue with one fifth strength.

CTR is in the region where tooling market is Rs.1400 crores out of which CTR produces about 2 %. There are commercial Tool Rooms in the region served by CTR. It can help them to upgrade their operations both in volumes and quality.

Manpower mix at CTR needs a re-look. Important functions like Production, Marketing and Design are, and have been earlier, headed at the level of Senior Managers or Managers head Junior Officers at the level of Assistant Manager as a stop gap arrangement. Now for many years, such arrangement lacks appropriate command.

CTR's objectives were to assist MSMEs of the northern region to enhance their competitiveness by providing to them high quality tools, common facilities in machining and heat treatment,

consultancy to increase the quality and productivity of their products, training young men for the industry and to sharpen skills of existing employees from the industry. In the initial years, CTR has supported the industry effectively. It assisted in setting up entrepreneurs which started as a small scale and graduating eventually to successful large scale unit. For sometime now stress has been more on cost recovery for which targets are fixed but no targets are kept in view about assistance to MSMEs and outreach and impact. As a result, priority is to go in for jobs which give higher revenues rather than hand holding with MSMEs, specially micro and small units who now find CTR's price level beyond their reach and delivery periods too long to wait. In an effort to keep costs low, vacancies at position of heads of the departments in Production, Marketing and Design have not been filled for many years. For the same reason HRD is low priority, no training programmes to improve knowledge and skills of employees are being methodically organised. Motivation is lacking due to slow mobility or non-mobility in career progression Confidence building is needed. Employees are not coming forward to accept a performance related incentive scheme based on guidelines issued by DC MSME for all the Tool Rooms to improve performance.

CTR being a Government of India Society has to work under the guidelines of the Government. But there are areas in which the autonomy built into the system is also not being effectively used. For instance, Governing Council plays a significant though limited role in decision-making Some of the key challenges, constraints and solutions are enumerated below:

<u>Division/ function/ process</u>	<u>Challenge/constraints</u>	<u>Key solutions /ideas</u>
Policy goals and direction	Outlined policy goal for setting up of CTR is to enhance the competitiveness of MSME through supply of tooling services and skilled manpower. However, monitoring of performance is mainly on financial parameters and not so much on outreach and impact.	A balanced approach needs to be synthesised so that assistance to MSMEs is not lost sight of while aiming for self-sufficiency.
Autonomy of Institution	The CTR is set up as an autonomous society but is still to a large extent guided by Government policies. The decision making body - Governing Council meets once in a year on an average	Setting up one apex body under DC MSME to administer all Tool Rooms would be examined while consolidating management issues for all 10 Tool Rooms
Core Management Team	Motivation required in the core management team of General Manager and the next line of Head of the Departments.	Career improvement issues should be redressed. If required vacancies at lower levels could be kept vacant instead of those at higher levels
Management Systems	No analysis available on trials required for each tool before it is successful, data on cost estimates and actual costs is not analysed and post placement tracking of trainees is not undertaken	Design of IT enabled Financial and Management Information System (FMIS) is required
Procurement System	CTR follows General Financial Rules (GFR) calling for quotations and decision making guided by L1 principle due to which suppliers tend to quote lower rates, sometimes compromising on quality.	Development of a procurement manual would be beneficial.
Networking with other	The networking with other Tool Rooms/institutions is limited except GMs	Networking with other Tool Rooms under MoMSME, also

institutions and alumni	meetings which usually takes place once in a year. The Tool Room does not leverage the network of its alumni to enhance its marketing.	at Heads of Departments level, would be useful. Again IT enabled platform networking with alumni is essential.
Pricing of services	The machine hour rates were approved by the Governing Council in the year 2000 and thereafter only on ad-hoc basis. Industry finds prices very high	Machine hour rates should be re-examined. Once costs are known actual rates can be fixed keeping market in view
Lack of expertise	Share of tools other than press tools has steadily declined and CTR is refusing die casting dies. The reason is lack of expertise; they have the needed equipment but not the designers since most of the trained designers have left. There has been no training of HODs. For sometime now.	Skill and knowledge development programme is needed. In addition to better skills & knowledge it improves employees' motivation.
Motivation and incentive system	Employees lack motivation. There is no incentive scheme.	Incentive scheme should be discussed with employees and introduced.
Lead time	The average lead time taken by CTR is on a higher side and the customers prefer private Tool Rooms to meet their tooling requirements.	Material procurement time should be reduced as also the tool try out times by use of simulation software in design stage. This needs capacity development of designers

Introduction

Background Information

Tool Room is the backbone of Industry as manufacturing excellence begins with tools, dies and moulds. To foster the growth of Micro, Small and Medium Scale Industries, Government of India set up ten Tool Rooms across the country with state of the art equipment for design and manufacture of tools and for training of manpower in employable skills. Of these, four were set up with the assistance of Government of Germany, three with the assistance of Government of Denmark, two under UNDP and one without any external assistance. These Tool Rooms are set up as autonomous bodies, Government of India societies, with DC MSME as the Chairman. The Tool Rooms have now been operating for about 10 years after the agreements of external assistance terminated. Deutsche Gesellschaft für Internationale Zusammenarbeit is supporting an evaluation study of 10 Tool Rooms. M/s Grant Thornton Advisory Private Limited has been retained as Consultants to carry out the Study.

Terms of Reference

Tasks entrusted to the Consultants are 'As Is reports of ten Tool Rooms, Ranking of ten Tool Rooms; Recommendations on improving the performance of the Tool Rooms and an action plan for the same. This is As Is report in respect of Central Tool Room, Ludhiana.

The consultant team has been tasked to analyse the existing strengths and weaknesses of the ten Tool Rooms in terms of their management, finances, human resources, technology and infrastructure, as part of the AS_IS assessment of Tool Rooms that includes the following:

- a. Institutional / organisational development study of the scheme consisting of political economy aspects involving actors, financial flows, management systems and inter-agency issues
- b. stakeholder feedback on existing Tool Room services from MSMEs and relevant business associations
- c. stakeholder feedback on further requirements from Tool Rooms by MSMEs and relevant business associations [a, b to be executed in form of a user feedback survey]
- d. training needs of Tool Room personnel
- e. Comparison of services with similar private sector and German facilities.
- f. Best practices from comparable national institutions such as the NITT Technical Training Foundation (NITT), Bangalore [NITT is a private educational trust established with the help of the Government of Switzerland]

Methodology

Data has been collected through secondary research, publicly available information on MSME Tool Rooms and through a structured questionnaire, filled by the respective Tool Rooms. Facility of the Tool Room was visited and series of meetings and discussions took place with senior and middle management of Tool Room, local associations, suppliers, users & non users MSMEs, large client and state government agencies for qualitative assessment.

Complete list of officials met is at Annexure I.

Based on the quantitative information and qualitative assessment, functioning of each Tool Room has been assessed and analysed to provide actionable recommendations for improving alignment of Tool Room services to the strategic goals of government in setting them up through optimum mix of different service and delivery approach, increased revenue, outreach and impact; improved organisational procedures and governance mechanism, technological and human resource development, enhanced networking etc. Recommendations shall be accompanied by a time bound and cost estimated action plan for the DCMSME to implement. Cost estimates would refer to requirements of additional machinery and equipment, general infrastructure, staff restructuring, training etc that would be needed to implement the recommendations. In addition, an institutional analysis framework that can be used by the Ministry in future will also be developed.

However, this report is limited to AS IS assessment and analysis of Tool Room functioning and recommendations are part of a separate report for all the 10 Tool Rooms.

Structure of the report

The report has been structured as mentioned below:

Chapter I – Organisation Profile: A brief description of CTR Ludhiana.

Chapter II – Governance, Management systems and Processes: This chapter assesses the autonomy of the Tool Room and its Chief Executive, the General Manager, guidelines followed by the Tool Room defined by the Ministry of MSME and the level of interaction between DC MSME and the Tool Room.

Chapter III – Organisational Assessment: This chapter assesses the current status of service portfolio, technological infrastructure, marketing strategy, finance, management systems, human resource and its impacts against the stated policy goals.

Chapter IV – Overview of local Business Environment from Tool Room perspective: This chapter assesses the location of the Tool Room and the market potential for it to expand its services. It also analyses the availability of raw material and machinery suppliers in the region.

Chapter V – Inclusive Growth underlined by Social Impact: This chapter analyses the impact made by CTR in all the three areas of training, tooling and dissemination of environmentally friendly technologies to MSMEs.

Chapter I

Organisational Profile

CTR Ludhiana

Government of India established the Central Tool Room (CTR) in Ludhiana in 1980 with technical and financial support from the Government of Germany and the active support of the State Government of Punjab, which provided land and buildings.

CTR has been set up as "Government of India Society" under the Ministry of Micro, Small & Medium Enterprise, Government of India. Governing Council constituted by the Ministry manages the affairs of the society, DC MSME being the Chairman of the Governing Council.¹

Table 1: CTR Profile

1.	Project Background	Central Tool Room(CTR), Ludhiana was established as a training and common facility centre in the area of Tooling for promotion of the small scale industrial units in Punjab and adjoining states of Delhi, Haryana, Himachal Pradesh, Jammu and Kashmir and union territory of Chandigarh. It was set up under an Indo-German Technical Co-operation Agreement of 1977 that started operations in 1980. CTR is the oldest Tool Room of the Indo- German Technical Co-operation Programme in operation.								
2.	External Agency	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH								
3.	Funding Pattern	<table><tr><td>GOI (In Rupees)</td><td>GIZ (In Rupees)</td><td>Total (In Rupees)</td></tr><tr><td>32.82 crores</td><td>14.50 crores</td><td>47.32 crores</td></tr></table>			GOI (In Rupees)	GIZ (In Rupees)	Total (In Rupees)	32.82 crores	14.50 crores	47.32 crores
GOI (In Rupees)	GIZ (In Rupees)	Total (In Rupees)								
32.82 crores	14.50 crores	47.32 crores								
4.	Organisational Structure	Government of India Society – An autonomous body under MoMSME, DC MSME								
5.	Objectives	• To increase the efficiency of MSMEs in the Northern region in the light engineering and allied fields by providing support in the area of design & production of tools, jigs, fixtures and advisory and consultancy services. • To manufacture small & medium sized tools such as press tools, jigs & fixtures, moulds dies and special purpose tools. • To provide common facilities for manufacture of tools, jigs & fixtures, moulds and dies and in various Heat Treatment								

¹ Organisation Chart is given at Annexure II.

		operations for MSMEs and other industries. • To impart technical training to tool makers for press tools, dies, jigs & fixtures, moulds, dies etc. • To conduct short term and part time courses for the representatives of MSMEs of the region. • To provide Rapid Prototyping parts to the industries for new product development.
6.	Technology	Following technologies are available at CTR for tooling, production, training and rapid prototyping: a. The tool production facilities include CNC milling and turning machines, CNC wire cut machine, Jig Boring Machine, Jig Grinding Machine. b. Heat treatment facilities like Induction Heaters, salt baths, Gas Carburizing furnace. c. Rapid prototyping systems to produce models and prototype parts from 3D computer-aided design (CAD) model data, CT and MRI scan data, and data created from 3D digitizing systems.
7.	Training Programmes	a. Long-Term Courses (One year or more duration) 1. Four-Year Diploma Course in Tool & Die Technology. This course is affiliated to the Punjab State Board of Technical Education (PSBTE), Chandigarh and is approved by All India Council for Technical Education (AICTE), Delhi. 2. Two-Year Certificate Course in Heat Treatment. 3. One year Post Diploma and Certificate Courses in Tool & Die Making, CAD/CAM, Computer aided Tool Engineering and Computer aided Tool Design b. Short-Term Courses (Less than one year) The Short-Term courses address various topics in the field of Tool Engineering. They deal with CNC programming and machining as well as CAD/CAM.

Chapter II

Governance, Management Systems and Processes

This chapter assesses the autonomy given to the General Manager of the Tool Room, guideline followed by the Tool Room defined by the Ministry of MSME and the level of interaction between DC MSME and the Tool Room. This also assesses the role of GC in the overall functioning of the Tool Room. This is to analyse how all these factors are contributing or hindering the performance of CTR Ludhiana.

Policy Goals and Direction

Monitoring of performance is mainly on financial parameters and not so much on outreach and impact. A clear reason that emerged from the interactions with the stakeholders is the policy direction which emphasizes self-sustainability and cash recovery without much emphasis on the impact on MSMEs or job creation. As a result, the CTR prioritizes tooling and production jobs which are from the larger enterprises because of higher revenue and similarly much of training initiative is towards summer training of students pursuing engineering, ITIs, etc. which is not contributing towards skill gap faced by MSMEs.

Strategic Shift

Autonomy of Institution

The CTR is set up as an autonomous society but is still, to a large extent, guided by the Government policies, and in some cases even Government rules and regulations. The decision making body - Governing Council meets once in a year on the average and that too mostly coincides with the Annual General Meetings called for approving the annual accounts and annual reports. The private sector members of the GC are not active participants.

Suggestion has emerged during meeting with DC MSME and with stake holders at CTR that one central apex body under DC MSME to administer all Tool Rooms would improve governance issues and networking. This would be examined while consolidating management issues for all 10 Tool Rooms.

Characteristics of Core Management Team

Motivation level in the core management team can be additionally improved by addressing issues like organisational structure, career progression, skill and knowledge development and incentives for a better performance. Higher vacancies are not being filled to keep the expenditure low as performance is judged mainly on cost recovery basis, that is income vis a vis expenditure. This needs to be redressed. Filling higher vacancies, keeping lower positions vacant, is one solution. With that,

additional costs will be only incremental which would be offset by improved performance. The proposal does not call for additional vacancies or change of sanctioned manpower structure. The Tool Room has, however, spelt out the need for more direct workers and not so much at the managerial level to have a flat structure in the near future for gradual organizational growth every year.

Annual Targets

There is no formal need assessment undertaken to estimate the market opportunity for its services. Each year annual targets are fixed for training and production which are not linked to the market opportunity or desired level of impact. The targets are both financial and physical (in case of training); however, there are no targets with respect to the value of assistance to MSMEs. The table below provides details of targets achieved by the CTR in the year 2010-11.

Table 2: Annual Targets

Service	Target	Achievement	Achievement %
Training (Physical)	1600 persons	1952 persons	122
Training (Revenue)	Rs 292 lakhs	Rs 281.46 Lakhs	96
Production (Revenue)	Rs 348 lakhs	Rs 364.36	104

Source: Action Plan report submitted by CTR

Management System

The CTR is an ISO 9000–2000 certified organisation. There are Standard Operating Procedures (SoPs) for the following which are documented and followed at the CTR:

1. Preventive maintenance
2. Estimation sheet for quoting the prices for tooling
3. Quality plan
4. Performance of the tool job completed
5. Inspection report for the raw materials purchased
6. In – process inspection report (including inspection of re work),
7. Final inspection report
8. Calibration control card
9. Product release note and deviation note
10. Rejection Report

While there are various data generated, there is no integration and analysis of cost estimates and actual costs of production of tools. Post placement tracking of trainees is not undertaken. Design of IT enabled Financial and Management Information System (FMIS) is a requirement which can be linked to a suitable reward / incentive system. Suitable training and capacity building of the staff is necessary alongside.

Procurement system

Even though the raw material suppliers are locally available who can supply tool steel from reputed manufacturers from all over the world, CTR needs to follow the procurement guidelines laid down in the General Financial Rules (GFR) calling for quotations and decision making guided by L1 principle due to which suppliers tend to quote lower rates, sometimes compromising on quality. The procurement procedures are lengthy and delay tool delivery. Being a public institute CTR has to adhere to the financial regulations but within that also the process can be made faster with yearly rate contracts. During discussion, suppliers indicated that they could hold the rates fixed over longer periods. The rates therefore need to be linked, for adjustment, with some official indices.

For capital goods, an action plan with details of equipments and related costs is prepared in consultation with local GC members and submitted to DC-MSME at the beginning of FY which

upon approval is ratified by the Governing Council. However, there may be delay in actual purchase since financial due diligence by the Integrated Financial Wing is after ratification.

Development of a procurement manual covering the operational details on above suggestions would be beneficial to improve efficiency and effectiveness of procurement.

Networking with other Tool Rooms, Institutions and Alumni

The CTR can significantly improve networking with alumni which can lead to more business and placements as many ex-trainees eventually occupy decision making positions for tool planning in the Industry. There is no formal system at present.

The training initiative can be scaled up through networking with institutions having infrastructure available with them e.g. ITIs, Polytechnics, state government Tool Rooms / institutions, etc. There are more than 5 such institutions in Ludhiana itself. Networking with other Tool Rooms under MoMSME would also be useful for knowledge and capacity sharing. Again IT enabled platform for such networking is essential. At present net-working with other Tool Rooms is through meetings of General Managers of Tool Rooms which take place once in a year. Therefore, a continuous process of networking and knowledge transfer is needed to make the best use of available resources without overlaps.

Interaction with DC MSME

DC MSME monitors the performance of Tool-Room. System is in place under which Tool Room submits the following reports:

- a) Performance report, submitted monthly. Against annual targets, following information is submitted for the month and cumulative during the year up to the month of report:
 - > Revenue, expenditure, order position, delivery status, machine utilization, number of trainees and number of MSMEs assisted. Tool Room is required to explain the short falls, if any
 - > System brings out cost recoveries but not the impact and outreach to MSMEs. Instead of monitoring numbers it should bring out the value of assistance provided to MSMEs and highlight 5 technology related assistance cases. System should also be evolved to monitor customer and trainee feedbacks of courses conducted.
- b) Annual action plan containing targets and funds needed during the year for recurring and non-recurring expenditure. It is prepared in consultation with local members and submitted to DC MSME who approves the same in consultation with Integrated Finance Wing of the Ministry. It is then put to Governing Council for ratification. Role of Governing Council is limited to local members who are consulted.
- c) Monthly status of courts cases in which DC MSME is respondent.
- d) Annual Report which includes audited annual accounts for placement before the Parliament.
- e) Information on innovative work done. This is used for preparation of Cabinet Note on performance of MoMSME.
- f) Annual manpower status.

Decision Making

Management of the Tool Room is with the Governing Council. However it meets once in a year, on an average, when convened to pass Annual Accounts and Annual Report. These meetings are generally held away from the Tool Room premises. Also representatives of industry are not found to be taking interest in decision making and it is generally the officials from MoMSME and state Govt. who deliberate in the meetings. So Management and the Council are same. Members other than officials are volunteers. It is needed that the structure is revised in favour of greater percentage of independent members with no personal or professional relation with Tool Room e.g. representatives from universities and technology leaders. They should be paid honorarium for their services.

While expectations from CTR are similar to that from a private commercial Tool Room, it is not allowed the same level of autonomy. The Tool Rooms performing better and recovering full costs including depreciations should have greater autonomy to avoid delays in decision-making and tackle ownership issues..

Chapter III

Organisational Assessment

This chapter assesses the current status of service portfolio, technological infrastructure, marketing strategy, finance, management systems, human resources and impact of these factors against the stated policy goals. This chapter also analyses different factors contributing or hindering the performance of CTR Ludhiana in achieving its stated objectives and policy goals of “enhancing competitiveness of manufacturing MSMEs through tooling services and availability of skilled manpower.”

Overview of Services

CTR Ludhiana is currently offering “Tooling, Job Works and Training services” which are in line with its overall stated objectives. The following services are currently being offered by the CTR:

Table 3: Service Mix of CTR Ludhiana

Production		
Tooling / Rapid Prototyping	Job work	Training ²
- Design Development and Manufacturing of Moulds, Press tools, Die Casting Dies, Jigs, Fixtures and Gauges. - Rapid prototyping systems to quickly produce models and prototype parts	- Hardness Testing, Dye Penetration Test, Ultra Sonic Flaw Detector, Microstructure and Spectro analysis of material - Heat Treatment of Tool Steel such as High Speed Steel, Hot Die Steel, High Carbon High Chromium steel (D2 & D3), En- Series and special Tool Steel. - Common facilities in precision machining	- Long term training in Tool and Die making. - Specialized hi-tech courses in tool and die technology and CAD/CAM for Engineering Graduates, Diploma and ITI Certificate holders. - Tailor made skill enhancement courses for Industry - basic certificate course in Heat Treatment. - CAD/CAM training (at CTR City Centre at MSME-DI, Ludhiana).
In addition to the above CTR also provides Consultancy and Mentoring support to MSMEs to improve productivity by use of better tools and / or better production processes		

² List of short-term and specialised courses conducted by CTR is in Annexure III.

The service – sector matrix below indicates the services utilisation by respective sectors:

Table 4: Service - Sector Mix

Type of Tools/ services	Industry Sectors							
	Bicycle	Hand Tools	Fasteners	Plastic/ Rubber	Auto Components	Sewing machines	Home Appliances	Others
Heat Treatment	√	√	√					
Moulds				√	√	√	√	
Dies	√				√		√	
Gauges, Jigs fixtures					√	√	√	
Job work					√			
Rapid Prototyping				√	√			√
Training	√	√		√	√		√	

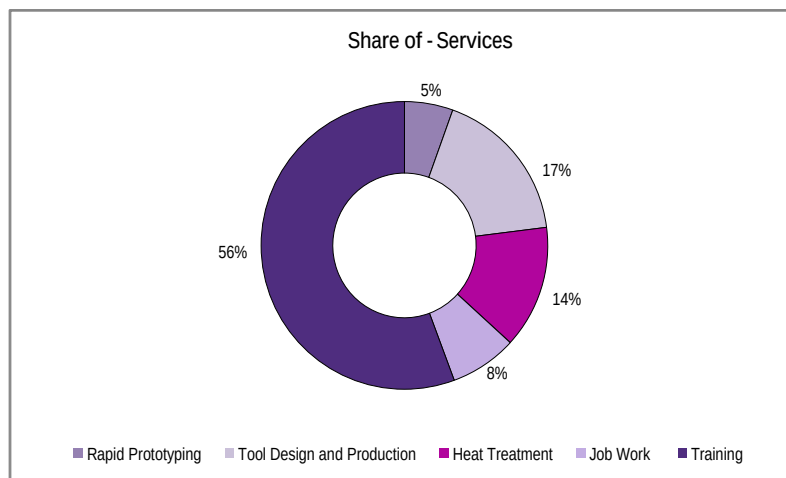
Contribution:

The break-up of revenue contribution from various services is given in the table below:

Table 5: Break-up of Revenue Contribution

Services	Income (in Rupees Lakhs) in 2009 – 10
Rapid Prototyping	28.65
Tool Design and Production	92.21
Heat Treatment	72.96
Job Work	39.70
Training	292.61
Total	526.13

Figure 1: Share of Services



The maximum revenue is generated by training services in the service mix of the CTR, contributing more than 56% of total sales realization in 2009-10. The contribution of income from training to total income has been steadily increasing every year, up from 30% in FY 2005-06 to 56% in FY

2009-10. This trend must be arrested if CTR has to serve the Industry in the field of tooling. Fixing of targets in this regard and aggressive marketing is needed. The targets for this must indicate the share of MSMEs.

Training

The CTR Ludhiana enjoys strong reputation in Training and there is demand for training courses at CTR. It is the first choice for admission through Joint Entrance Test conducted by the State Board of Technical Education, Punjab. In 2010 – 2011 the CTR trained over 1900 trainees. Trend from 2006-07 to 2010-2011 is given in figure 2:



Trainees in short term courses have increased more than in long-term courses. The prime reason which can be attributed to this is higher revenue earnings at relatively less cost against the backdrop of financial sustainability being the key performance area. The trainees for short duration programmes are primarily personnel already working in the Industry and students from the engineering colleges, ITIs or polytechnics who undergo these training courses to improve their practical skills.

In 2010-11, about 35% of total trainees were unskilled persons who imparted employment oriented skills while the balance 65% upgraded their existing skills.

The students for both the short-term courses and the long-term course (include condensed courses) are admitted from all over the country but majority (72%) come from within the region.

Training Income

Given below is a break-up of the training income received from long term course, short term course and condensed course. Currently 50% of the training income is coming from various skill development support programme of state /central government.

Table 6: Income from various courses

Training Courses	2008-09	2009-10	2010-11
Long Term Courses	82.97	82.97	82.97
Short Term Courses	133.81	212.6	201.64

Figure 3: Training Income from Various Courses



Scholarships and Fee Waiver

The Punjab State Board of Technical Education and Industrial Training awards scholarships to exceptionally bright students, in which 100% fees is refunded. These scholarships are only applicable to the four-year diploma course. No fee is charged from SC/ST students. From year 2010 – 2011, the CTR has also started giving 100% fee waiver to three General category students, whose parents' annual income is less than Rs. 2,50,000. This is being allowed only in the four year diploma Course. In 2010-11 Govt promoted another scheme, ESDP, under which 25 short term courses were conducted with an intake of 25 in each of duration varying from 100 hours to 300 hours for which fees were duration dependent and were paid by government without diluting CTR's earnings.

Placements

The CTR has a 100% placement record for its long-term training programmes. Short-term programmes are mostly skill up gradation programmes for students from polytechnics and other such institutes who go back to their organisations. CTR tries to place the short-term trainees who participate in these programmes on their own and are looking to get placed. The training department sends placement brochures for its long term courses to various Industries. The industry recruits the students by conducting on and off campus interviews. Majority of the candidates placed are recruited by MSME. About 78% of placements are in this segment.

Post Placement Tracking

There is no system of post placement tracking of candidates and thus leveraging the alumni potential for marketing of Tool Room services.

Pricing of Services

Tooling and Job Work

The pricing for any tooling job and production/job work is calculated on the following formula:

Cost = Machine hour rates X Number of hours on the machine

The Machine hour rates take into account the following components:

- Machine price
- Depreciation
- Electricity
- Consumables
- Maintenance
- Labour
- Overheads (Salary of Management staff, Maintenance, Administrative staff)
- Contingency
- Margin

The machine hour rates were approved by the Governing Council in the year 2000 and the GM was authorised to increase the same by 5% per year depending upon the market conditions. However, actual price quoted is not always based on this formula. According to the members of the Governing Council, some of whom are also customers of the CTR, the prices offered by the CTR for its tooling jobs are extremely high and a reason why many MSMEs do not come to the CTR for tooling. The CTR benchmarks its machine hour rates against Research & Development Centre, Institute for Auto Parts and Central Institute for Hand Tools, Jalandhar which are in the same range and have similar reactions from industry. Also, the CTR takes approximately three days to quote the price for an average tool which is high as per industry standards despite that a discount of 20% is offered to the MSMEs.

It is necessary that the machine hour rates are revisited and benchmarked against the market rates. Considering that these were prepared in 2000, the depreciation as per written down method would be zero and could be removed as a cost component. In many cases the depreciation cost may constitute more than 25-30% of the machine hour rates and manpower cost is also significant.

Further, the software programme used for pricing of production related services is Fox pro which needs to be upgraded to an integrated FMIS.

Training

The cost for each training programme is estimated at the time of commencement of the particular programme but comparison with actual costs is not available. Similarly, cost viz-a-viz fee comparison for each course is not maintained which makes it difficult to ascertain economy of individual courses.

Marketing -

System

The CTR has a marketing team comprising of professionals for tooling services, for other services like training, product development and production, the operations staff is also responsible for marketing. Each team is given annual targets which are communicated to the GC as well as DC MSME office. The progress is reviewed on a monthly basis.

Strategy

Key marketing strategy of CTR is industrial visits to regular and prospective customers, participation in exhibitions, online marketing through email and website for production services and newspaper advertisement and networking with engineering colleges, industry associations for training services. CTR participates in exhibitions like IMTEX, IITF and maintains website, www.ctludhiana.com.

Constraints

Key challenge faced by CTR in marketing of its production services is higher cost for simple tools and lack of speed compared to small private Tool Rooms, absence of strategy based on proper market need assessment and segmentation and inability to en-cash its reputation of high quality tools as a USP compared to private Tool Rooms.

Client Profile

Given the profile of industry in Punjab and adjoining states, the maximum demand of tooling is for moulds, forging dies, press tools, die casting dies etc. The CTR has developed expertise in press tools mainly for the auto components industry which has maximum share of tooling revenue. The supply of other types of tools by the CTR has steadily declined e.g. share of moulds has declined from 14.7% to 4.5% over last 5 years. Assignments Dies casting dies are being refused by the CTR. The reason for both is lack of expertise; the Tool Room has the necessary the equipment but not the trained designers or precision operators. At the national level, plastic moulds have a share of

about 37% of total tooling demand and expected to grow at CAGR of 17% ³followed by Sheet metal, Die Casting and Forging tools. The break up for spread of products, for the last five years is given in the table below:

Table 7: Spread of products, percentages based on values

Particulars	2006-07	2007-08	2008-09	2009-10	2010-11
Moulds for Plastics	14.7	3.4	9.2	10.5	4.5
Press Tools	3.2	21.6	32.2	31.1	29.5
Die Castings	<1	--	--	<1	--
Jig Fixtures & Gauges	10.2	5.3	4.6	1.9	2.75
Forging Dies	NIL	--	--	--	--
STD Items / Components	1.6	<1	2.2	3	1.7
Job work	10.4	18	10.4	16.5	19.4
Inspection related CMM Jobs Design & Consultancy	2	<1	<1	<1	<1
Other Production Aid (Heat Treatment)	18.2	20.2	19.5	26.6	30.9
Rapid Prototyping	39.2	30.5	21.4	10.4	11

Types of Industries Served – MSMEs assisted

The share of MSME customers of CTR has increased from 58% to 64% over the years. However, the interactions with the customers of CTR suggested that most of these MSMEs are medium scale units with many having their captive Tool Rooms and come to CTR when short of capacity. Most of these customers plan to increase their investments in captive Tool Rooms and their requirement from CTR may not grow. They cited long and non-reliable delivery schedule, lack of design capability and demand from their buyers to build in-house capabilities as major reasons. At the same time, the micro and small scale users suggested that they cannot invest in Tool Room facilities and depend on locally available commercial Tool Rooms because the CTR prices are significantly higher. However, they rate quality of tools supplied by CTR to be better than those of local commercial Tool Rooms. The table below provides trend of share of MSME customers to total customers of the CTR

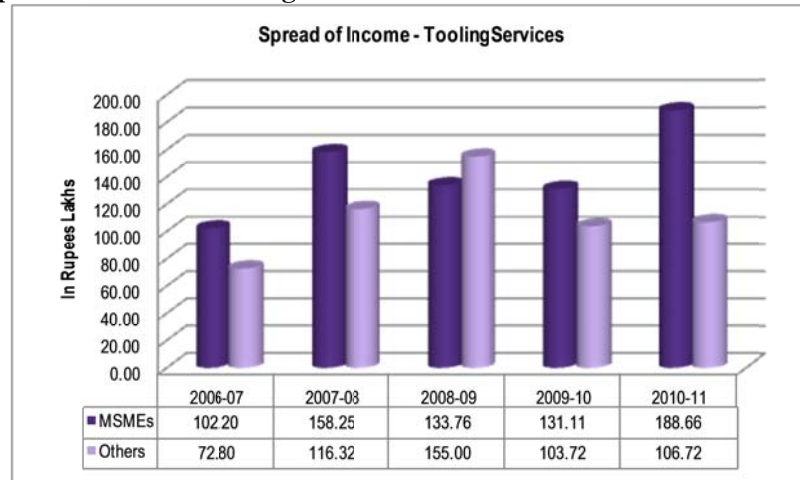
Table 8: Industry Break-up

Type of Industry	2006-07	2007-08	2008-09	2009-10	2010-11
MSMEs	58%	58%	46%	56%	64%
Large Scale	42%	42%	54%	44%	36%

The share of MSMEs and large enterprises in CTR's revenues is indicated in Figure 4

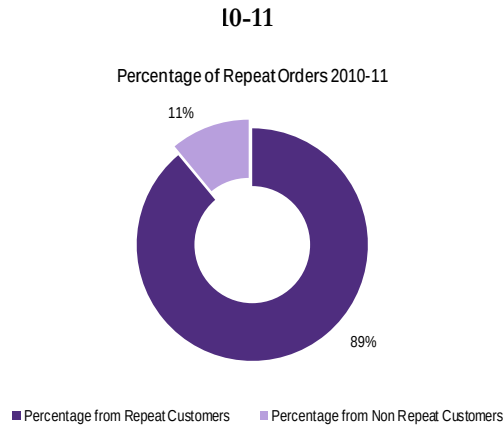
³ TAGMA Indian Tool Rooms Industry Report 2011

Figure 4: Spread of Income: Tooling Services



Proportion of Repeat Orders

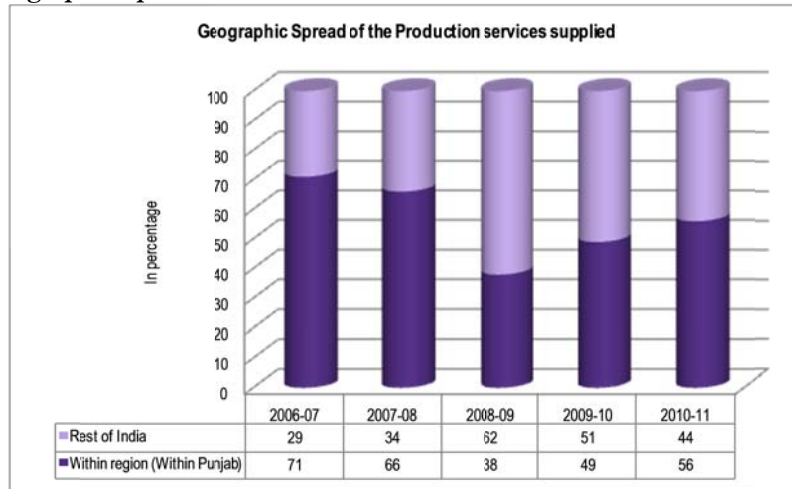
CTR scores well on customer satisfaction and retention, most of the CTR's tooling orders come from repeat customers, which being more than 3/4 of the total orders received during the year. Trend is shown in Figure 5.



Geographic Spread of the clients for tooling services

As indicated in the chart below, while majority of the customers of the CTR are from Punjab, their share has been rapidly decreasing. It was 71% in 2006-07 which has come down to 56% in 2010-11. This may be a cause of concern as the tool user industry in Punjab (auto components, plastics, etc) is quite significant at Rs 1400 crores and servicing local customers is usually more efficient and lucrative. In addition there is significant potential for impact as there are thousands of MSMEs in the region.

Figure 6: Geographic Spread of the Production Services



Physical and Technical Infrastructure

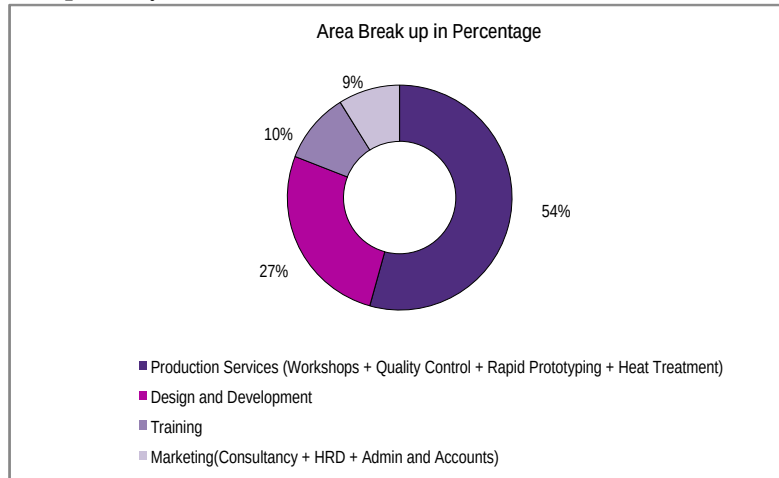
Physical Infrastructure

The CTR is a well equipped public commercial Tool Room in the Northern Region. It is located in the heart of the industrial area in Ludhiana on a developed plot of land of 7.5 acres. The total built up area of CTR is 7875 square meters. The built up areas for the various departments is given in Table 8 and Figure 8

Table 9: Facility Break-up

Facility	Area in Square Meters
Production Services(Workshops + Quality Control + Rapid Prototyping + Heat Treatment)	4275.00
Design and Development	2100.00
Training	800.00
Marketing(Consultancy + HRD + Admin and Accounts)	700.00
Total	7875.00

Figure 7: Break up of Physical Infrastructure



There is sufficient land available with CTR for its future expansion.

Utilities:

As regards utilities, CTR has an electrical sub-station, an air conditioning plant, submersible pump and tank for water supply. CTR has power back up which can feed all the critical equipment in case of power cut by Punjab State Electricity Board. They have the following DG sets:

Table 10: Power Back up

Capacity	Flexibility for use
Connected Load	826 Kilowatts/1000 KVA
Two, 200 KVA DG Sets	The system is flexible. It can feed all important machines on priority basis, as selected by the Management.
50 KVA DG Set	Dedicated DG set for Rapid Prototyping section only
Nitrogen Generator	For Rapid Prototyping section

CTR depends on outside supplies for welding gases and nitrogen for the Rapid Prototyping Plant. CTR is not alone here; all units of this kind procure these utilities from stockists or agents of such supplies. CTR has its own arrangements for water supply and generation of compressed air and dehumidifiers for using the compressed air for Rapid Prototyping Equipment. The utilities are adequate and procured appropriately on need basis.

Equipment in Production Related Services Sections:

Under Indo-German Technical Co-operation Programme, CTR was equipped with high-tech equipment needed at that time. Subsequently, the Plant and machinery has been augmented and upgraded from time to time.⁴

Appropriateness of Technology

The available equipment at CTR has the capacity to meet majority demands with respect to accuracy, complexity and physical size of tools. However, the age of majority of critical machines is in the range of 15-30 years which is very old resulting in a loss of accuracy and higher machining time. Moreover, spares for the older machines would be more difficult to procure as the machinery manufacturer is obliged to supply spares only up to 15 years from its purchase. It will be appropriate

⁴ List of equipment is in Annexure IV.

to utilise these machines for expanding the training capacity and add latest machines for tooling jobs.

Discussion with representatives of Tool and Gauge Manufacturers and representatives of Industry using the facilities at CTR indicate that, with manufacturing Industry growing at fast rates, particularly the automobile and auto component industry, demand for more accurate tooling involving more complex shapes and faster deliveries (due to frequent change of models) is growing, CTR does not have the appropriate equipment and technology to meet the future demands of the industry and also work as a demonstration centre for such technology for industry to adopt. Equipment capable of 5 axis machining and high speed milling should be procured by CTR.

Equipment in the Training Department:

Training Department is again well equipped as it has machines needed by a Tool Room and can thus impart practical training with high pedagogical values.⁵ Equipment includes conventional machines as well as CNC machines of a general engineering workshop. The department has typical Tool Room equipment like:

- CNC Wire EDM Machines
- CNC Electrode EDM Machine
- CNC Milling Machine
- CNC Lathe
- CNC Co-ordinate Measuring Machine
- CAD/CAM hardware and software

Design Development:

The Design department plays an important role in the success of a Tool Room. Its services include Product Design and Tool Design before the tools are taken up for production. It also assists the Rapid Prototyping Section in converting the product design data to acceptable format for the Rapid Prototyping Machine, STL.

Appropriateness of Technology

Design office has separate workstations for all the employees and software packages in CAD and CAM. It also has simulation packages which can help a designer to simulate the working of a tool and rectify the design, if anticipated working parameters are found to be defective. This helps the designer in improving the designs and avoid substantial re-working in trial of tools and saves expensive machine capacity in Production Department.

But simulation software packages are not efficiently used as the staff, experienced in using these has either left or the current staff is not adequately trained to use this software. This affects the performance on two accounts:

- Percentage of tools successful in first trials tends to be low
- Time and labour spent on rework or remake of rejected or defective parts tends to be high.

The MSMEs typically come with the component expecting the Tool Room to prepare the tool design to produce that component. Without design skills, it is difficult to service such MSMEs which are significant in number.

⁵ List of equipment in Training Department is given in Annexure V.

Human Resources:

Out of the ten Tool Rooms under the Ministry of MSME, CTR Ludhiana has the highest number of employees, with strength of 118. In addition to the General Manager who is the Chief Executive and his Private Secretary, CTR has the following personnel:

Table 11: Personnel

Designation/ Department	Senior Manager	Manager	Assistant Manager	Foreman/ Engineer	Technician	Others
Administration			5		1	13
Marketing			1	2		2
Design			2	2	2	
Production		1	2	6	45	3
Training	1	1	2	5	6	4
Rapid Prototyping			1		1	
Quality Control				1		
Maintenance			1		6	
Sub-Total	1	2	14	16	61	22
Total	116 (118 including GM and his Secretary)					

Vacancies and requirement: CTR has not recruited personnel in the departments which require expertise such as design and manufacturing. During discussions with the management the reason which emerged for non recruitment was the policy to keep the salary level low at CTR which is already at 65% of the total expenses. But lack of man power, at such crucial positions as Deputy General Manager and Senior Managers is telling on the performance of production related activities at CTR. This view is supported by the declining share of production related services in CTR's turn over, brought out in financial analysis.

- Production Department which is the nerve centre has no Head of Department at an appropriate level of Sr. Manager. A senior and competent technically qualified person should manage the design activities.
- Only one Engineer in quality control is insufficient and more engineers need to be recruited.
- Automation through CNC has technician strength of 61 and needs to be reduced.

This imbalance in staff needs to be addressed through new recruitments and reallocating the staff in over-staffed divisions.

Skill up gradation /capacity building need

Skill and knowledge development programmes are needed for existing employees. Apart from acquiring new skills and knowledge such programmes affect employees' motivation.⁶ Acquisition of new skills is rather limited e.g. the design team is not updated to use latest design and simulation softwares, something critical for a Tool Room nowadays. CTR had undertaken training drive in 2002-2003 when all employees engaged in CNC manufacturing and training were trained under GTZ (now GIZ) at Incite Training Centre in Bangalore, a professional institute for training in CNC Technology. In recent years, training of some of the management staff has been organised on CNC operation and programming with CAD CAM.⁷ However, these trainings are incremental and not oriented to impart new skills to meet emerging market demands e.g. , fast cutting technology, tungsten carbide tooling, next generation intelligent CNC milling, simulation design software etc. The training department team can significantly benefit from acquisition of latest pedagogical skills as

⁶ The details of trainings attended by employees at various levels are given at Annexure VI

⁷ List of employees who have undergone training is at Annexure VI.

also management skills for large scale training programmes, and same is the case with marketing team.

Retention: The retention pattern is reflected in the table given below.

Table 12: Retention Pattern

Designation	Total number of employees	Number of years at CTR					Number of employees undergone technical training
		20 years and above	15 – 20 years	10 – 15 years	5 – 10 years	Less than 5	
GM and HODs	7	2	1	1	3	0	0
Supervisor	23	18	3	1	1	0	8
Technicians & equivalent	58	32	18	4	2	2	58

Out of the 118 employees, about 70% are shop floor-operators and supervisors. Almost 90% of the shop floor employees are with the CTR for more than 15 years which is a factor for unusually high proportion of manpower cost in total expenses.

Incentive System: The Tool Room currently has no incentive system in place for the employees as they have not accepted an incentive system based on the guidelines issued by DC MSME for all Tool Rooms. They are content with bonus as announced by the Central Government for its employees which has no link with the individual performance.

Developing MIS to establish accountability and contribution of each individual employee and departments will improve effectiveness. It would also enable putting in place a performance linked incentive system. Initial analysis reveals that the cost and contribution of human resource significantly varies across departments e.g. training with about 20 % employees contributes more about 56% of revenues.

Operational Efficiency

Lead Time and Quality

The CTR Ludhiana is known for the quality of its tooling work. However, the lead time taken by CTR for a normal tooling job is 3 months, which for the industry is on a higher side and the customers prefer private Tool Rooms to meet their tooling requirements. Out of these three months, one month is taken in design and procurement of materials, about 5-6 weeks in production and one to two weeks in trials often needing rectifications. According to the CTR customers interviewed, tools made in Taiwan have an average lead time of 1 month, are 20% cheaper and have a longer life than the tools made at CTR.

During 2010-2011, the CTR lost Rs. 7.17 lakhs in salvaging rejections which is about 2 % of total production revenues. The major reasons for rejection and rework were bad workmanship and faulty designs.

All stakeholders like associations of industry, user industries and members of the Governing Council representing industry, as well as Director MSME Development Institute, highlighted that while the quality of tools from CTR is good, the CTR price is very high and the delivery time a bit too long. Higher prices discourage MSMEs to use CTR for tooling, an issue which needs to be redressed, and confidence of MSMEs regained. Better quality will attract more prices. Deliveries could be improved by cutting down material procurement time and tool-try out times by use of

simulations softwares in design stage, the use of which has been discontinued for some time due to lack of training of the designers.

Machine Utilisation

Utilisation data for 15 critical machines at CTR in production related services was examined. The analysis indicates that there is a significant scope for improvement. Ideally critical machines should be used round the clock. Since Tool Room operations are non-repetitive and all tool parts need different routing and scheduling, CTR should aim to achieve 85% utilisation of this. CTR's position with regard to utilisation of these critical machines is as below:

Table 13: Machine Utilisation

Description	Number of hours
Installed capacity ⁸	102240.0
Attendance/ machines manned	47122.5
Estimated for jobs during 2010-11	33274.8
Actual time taken against above estimates	40058.0
Rework	583.0
No work	2055.0
Others	4426.5
Utilisation w.r.t. actual time machines were engaged on production	40%
Utilisation w.r.t. CTR's estimates for production planning	33%

As highlighted in the table above, utilisation is significantly low which has an adverse impact on pricing. CTR prices will come down if this ratio is improved. Machine-hour rates will come down if utilisation could be increased as depreciation and other fixed cost will be spread across greater number of machine hours.

Table 14: Machine Breakdown

Total breakdown hours for the top 15 machines of CTR in 2010 – 11	6142.80 hours
Total Machine hours attended	47122.50 hours
Percentage of breakdown period	13.04%

Break-down is high as some machines are old and difficult to maintain. Machines should be evaluated and those beyond economic repair should be disposed of.

Financial Analysis

Analysis has been done of the performance data for the last five financial years from the CTR's Annual Reports made available for the following indicators:

1. Net worth
2. Profitability analysis

⁸ Calculation of installed capacity:

Days in a year	=	365
(Less) Sundays	=	(52)
Saturdays	=	(12)
Holidays	=	(17)
Net working days	=	284
Number of Hours on 24x7 basis (284x24) per machine	=	6816
Number of hours on 24X7 basis (284X24) for 15 machines	=	102240

3. Trend of income and expenditure

Net worth

The net worth of an enterprise is the sum of total equity and retained earnings. Net worth reflects the value of the enterprise, considering it is composed primarily of the money that has been invested in the enterprise since its inception, as well as the retained earnings for the duration of its operation.

Table 15: Net Worth

Particulars	2005 - 06	2006 - 07	2007 - 08	2008 - 09	2009 -10
Net worth	195,733,915	208,450,541	221,698,642	230,778,499	245,017,887
Year on year increase		6%	6%	4%	6%

The net worth of CTR, Ludhiana has been increasing every year around 6%, which is a healthy sign as it implies an increase in value of the Tool Room. The same is primarily on account of the Government grants in aid being received every year by the Tool Room.

Table 16 gives the trend of government grants being received by CTR, Ludhiana:

Table 16: Government Grants

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10
Contribution from GOI	23,000,000	25,000,000	25,000,000	25,000,000	30,000,000

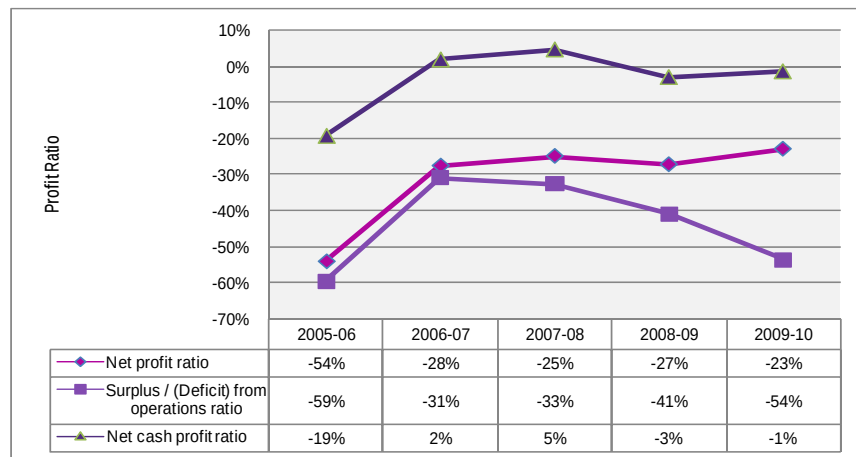
Net worth of the Tool Room excluding the government grants received is provided in the Table 17.

Table 17: Net-worth without Government Grants

Particulars	2005 - 06	2006 - 07	2007 - 08	2008 - 09	2009 -10
Net worth excluding government grants	172,733,915	160,450,541	148,698,642	132,778,499	117,017,887
Year on year increase		-7%	-7%	-11%	-12%

The Net worth of the Tool Room is being sustained only on account of government grants. If the same are withdrawn, the Net worth of the Tool Room is declining on account of losses being accrued. All investments by the GoI are getting eroded as a result of losses made by the CTR.

Figure 8: Profitability



The deficits of the Tool Room have been increasing every year in absolute terms. However, the Deficit ratio has been decreasing as can be seen in the table above.

The Tool Room has been incurring losses from its operations. The losses are further set off to an extent by Government grants. Grants have mainly come in for capex but they do subsidise operations indirectly by making up for the net worth erosion. For sustainability, it is important for the CTR to make net profits.

Tool Room is operating near the cash profit breakeven point. In FY 2006-07 and 2007-08 there was a cash surplus of 2% and 5%, respectively. But in FY 2008-09 and in FY 2009-10, there was a cash deficit of 3% and 1 %.

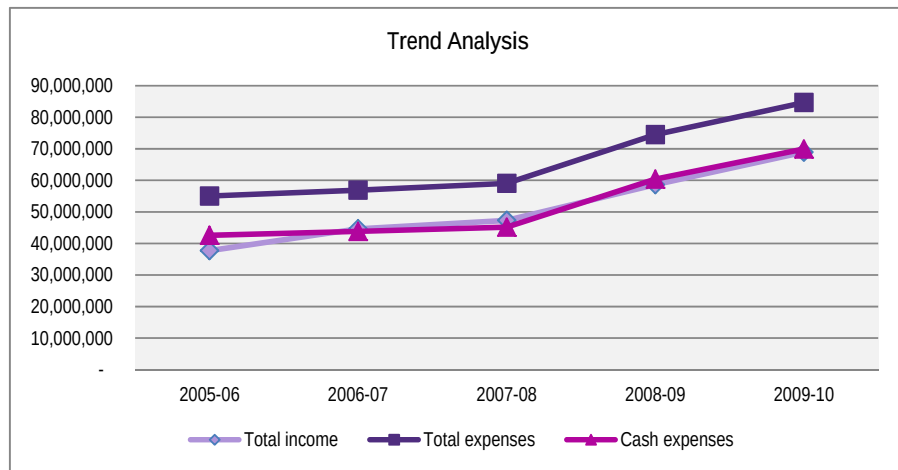
Trend of income and expenditure

Given below is a diagram reflecting the relationship between the income, expenses and cash expenses:

Table 18: Income-Expenditure Trend Analysis

Particulars	2005 - 06	2006 - 07	2007 - 08	2008 - 09	2009 -10
Total income	37,727,922	44,610,290	47,288,557	58,593,675	68,907,798
Total expenses	55,053,097	56,893,664	59,040,456	74,513,818	84,668,410
Cash expenses	42,570,160	43,817,670	45,149,153	60,374,176	69,922,717

Figure 9: Income-Expenditure Trend Analysis



- The revenue has increased during the five years at an average year on year increase of 16%. However, in the year 2006-07, the increase in revenue was only 6%, far lower than the normal trend.
- However, the revenue has not been able to recover the costs. The same can be seen that the Tool Room is incurring cash losses and the same, although marginal, are contributing to the deficit of the Tool Room.
- The rate of increase in the revenue is higher at an average of 16% compared to the rate of increase in the expenses at an average of 12% and cash expenses at an average of 14%. Given this trend and keeping all other conditions constant, the Tool Room should be able to earn cash profits in the coming year and should start incurring book profits in the next 4 years.
- The sudden spike in the expenses in FY 2008-09 was on account of the increase in the salary costs due to the revision of the salary costs of the employees on the basis of the Sixth Pay Commission's recommendations. A similar spike can be seen in cash expenses, also.

Chapter IV

Overview of local Business Environment from Tool Room perspective

This chapter assesses the location of the Tool Room and the market potential for it to expand its services. It also analyses the availability of raw material and machinery suppliers in the region, although Tool Room has no control over these factors but they do affect its working.

Location and Market Potential

Central Tool Room is located in industrial belt of Ludhiana and therefore, has a strategic advantage from its location. Ludhiana, the city and its nearby cities have significant concentration of industries which are heavy users of tools, moulds and dies. The major industrial cities of Phagwara, Ludhiana & Rajpura in Punjab; Baddi-Barotiwala-Nalagarh Belt in Himachal Pradesh, Faridabad and Gurgaon in Haryana and the Union Territory of Chandigarh can be effectively serviced by the CTR. The auto components, fasteners, plastics, bicycle parts, home appliances, and hand tools industries in these cities are estimated to consume more than Rs 1400 crores worth of tools. These sectors have witnessed significant growth in the past few years e.g. auto component sector had CAGR of 28%, Plastics 12 % and electrical home appliances grew at 14%. The trend is likely to continue. Since the tooling demand grows in the same proportion, it provides significant market opportunity for CTR.

The Supplier Chain

Raw Material Suppliers

Ludhiana has presence of many major importers and stockist of imported Tool Steels, standard mould, dies sets and their component and therefore in case of available stocks the deliveries are prompt within the same day and for the others within three to four days of order confirmation⁹. This enables CTR Ludhiana to procure its requirement without any delay after an order is placed.

Machinery Suppliers

Machinery suppliers for both conventional and precision machines have agents / representatives based in Ludhiana which offers an advantage in prompt servicing and attending to break downs.

Summary of Backward Linkages:

Table 19: Backward Linkages³

Input	Linkage/ Sources
Raw Materials	Stockists in Ludhiana, Mumbai and Chennai. Agents and importers in Mumbai and Chennai
Machine Tools	Manufacturers for indigenous machines. Direct imports for imported

⁹ source: discussion with suppliers in Ludhiana

	machines, nearly all such suppliers have agents in India for liaison and service back up. Some imported machines are also available in rupee payment in India from agents
Standard Moulds and Die sets	Manufacturers or stockists, mostly outside Ludhiana and some complex parts like hot tubes for hot runners etc are imported.
Cutting Tools	Manufacturers and stockists sufficiently present in Ludhiana
Consumables like oils, greases, salts	Stockists in Ludhiana
Spares	From OEMs except for standard spares like bearings
Specialised Maintenance/Servicing of CNC Machines	By the machinery suppliers. In case of imported machines this is provided by agents of the foreign suppliers through annual Maintenance Contracts which tend to be expensive or on visit basis which is preferred by CTR. Service agents are based at the headquarters of the agent and arranged on need basis. Agents of a few foreign principals / suppliers have their branch offices or liaison offices in Ludhiana which is an advantage for close liaison with service engineers and cuts down time for attending to the break down

Growth and Presence of Private commercial Tool Rooms

As per various industry estimates, currently there are about 15 private Tool Rooms and a number of captive Tool Rooms in Ludhiana. Most of the commercial Tool Rooms are small and specialise in specific area. While private Tool Rooms have flexibility in decision making like procurement of raw materials, consumables and equipment they lack modern technologies like advanced CNC machining and rapid prototyping. On the other hand, CTR holds advantage in these machines though the services of CTR by MSMEs are not sufficiently utilised. Last year, CTR did less than 4 crores worth of production work while demand of the region is estimated to be Rs.1400 crores. Government Tool Rooms cannot meet the gap between demand and supply of tools. Private commercial tool making must be encouraged and Government Tool Rooms should act as a catalyst. CTR should therefore assist commercial Tool Rooms in and around Ludhiana to expand their operations. Ludhiana has easy availability of raw materials, standard die sets and consumables. CTR should support them in the following areas:

- Design and development of products and tools
- Developments of prototypes
- Making tool parts for which commercial Tool Rooms do not have the facilities
- Assistance in programming of CNC machines to the extent available with these Tool Rooms
- Assistance in selection of new equipment

Chapter V

Inclusive Growth underlined by Social Impact

CTR has made impact in all the three areas of training, tooling and dissemination of environmentally friendly technologies to MSMEs.

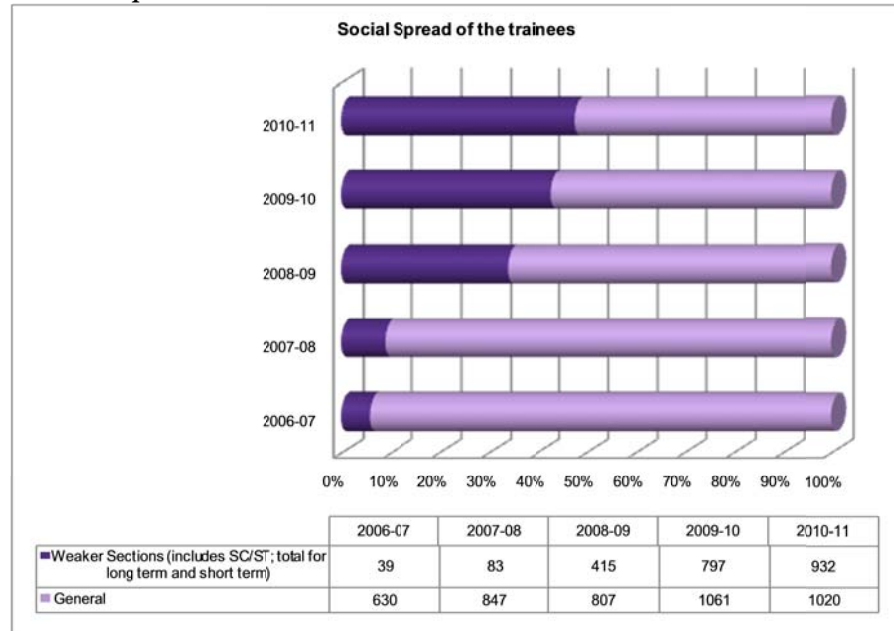
While CTR trains about 1950 candidates per annum under various training programmes generating employment, it has also supported MSMEs significantly through its services. For instance, it supported an MSME in starting an industry to manufacture staplers and its pins and developed all the tooling (press tools) for it, provided consultancy to establish production and selection of materials. With CTR's assistance, the company not only commenced production but competed successfully with importers from Japan who had about 50% market share. Today Japanese staplers companies struggle to compete. The company is now a large unit. CTR's assistance has thus resulted in growth of the MSME into a dominant player in its market segment and graduate to a large-scale enterprise.

The heat treatment technology (salt bath) and handling of its effluent was successfully demonstrated by the CTR. Today, Ludhiana has a number of units which have adopted this technology; employing trainees from CTR who have completed HT course.

Social Spread of Trainees

The CTR has had a balanced spread in terms of training to General category students and weaker sections.

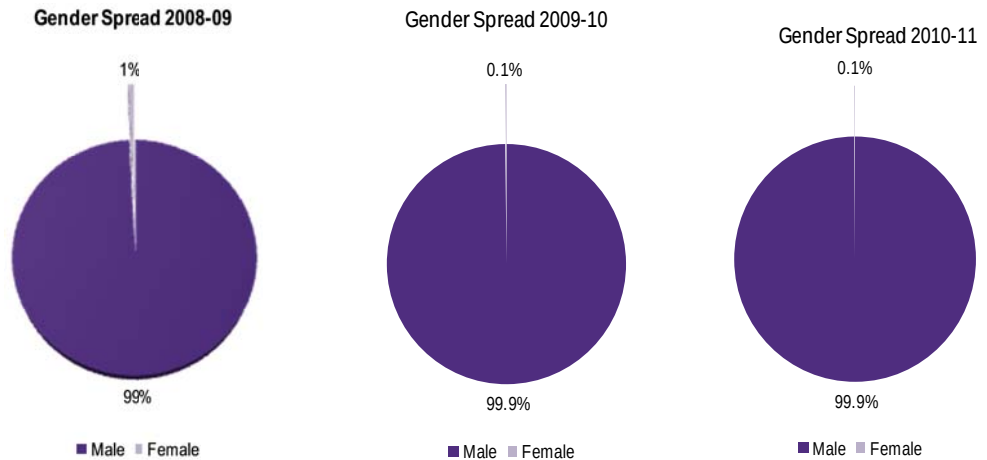
Figure 10: Social Spread of the trainees



Gender Spread

Given below is the gender spread in the Tool Room for its long and short term courses for the last three years. The sex ratio of trainees is skewed. No special incentive is provided to encourage women to participate in the trainings.

Figure 11: Gender Spread



Despite some successes, the impact of CTR in terms of development of MSMEs and human resource for the industry is rather limited and scaling up has not been undertaken. The number of trainees is marginal in comparison to industry demand (Auto component industry needs additional manpower of more than 35 million over next 10 years). The share of CTR is less than 1 % of the local tooling demand and micro and small enterprises are not the prime beneficiaries. In spite of the need, the intervention to support MSMEs in the recent past for technology up gradation has been limited. For instance, adoption of cleaner technologies like vacuum heat treatment (more recent and in demand than salt bath technology) has not been taken up

SWOT

Strengths

- It is the most well equipped commercial Tool Room in the Northern Region. CTR is set up with development objectives and offers its services without commercial objectives
- Is the only Tool Room with state of the art Rapid Prototyping equipment and relevant skills
- CTR is reputed for the quality of its products in the field of Tooling and Training Services
- CTR has a good training expertise and equipment.
- Has developed specialisation in press tools and moulds for auto components which are growing segments of the market

Weakness

- Tool Design skills are weakening; lack expertise in latest software and simulation packages
- Low level of utilization of installed capacity
- High response time and procedural delays
- CTR has a large number of personnel increasing the overheads and thus the price of tools
- Pricing is not scientific and management's capacity is limited in using pricing techniques and other financial management tools
- Lack of performance based incentive scheme to motivate employees
- Limited use of Financial and Management Information systems
- Crucial Departments like Marketing and Production are being managed by low level officers as vacancies of Senior Managers and Managers have not be filled for four / five years
- Depleting understanding of the local market and MSME needs

Opportunities

- CTR has established reputation of a quality tool maker
- Significant scope for scaling up training and tooling services given the favourable market conditions
- Abundant demand for tooling from the region. Tooling demand from the region is estimated at Rs.1400 crores.
- Location in a growing industrial area
- Huge requirement of trained manpower
- Government support for capital investment is available
- Raw material suppliers are locally available who can supply tool steel from reputed manufacturers from all over the world.

Threats

- Monitoring based on indicators of self sustainability has diluted impact on MSMEs and job creation
- Easy procedures and low customs duties for import of tools. TAGMA's latest survey indicates that more than 30 % tooling is imported in the country
- Low price levels and faster deliveries of tools from some countries, especially China and Taiwan
- MSMEs prefer low costs of tools compared to high cost tooling services provided by CTR
- Mushrooming of large number of commercial tool manufacturers around CTR offering shorter delivery times and cheaper tools
- Ageing infrastructure and manpower

Conclusion

CTR has made significant impact in the past in creating skilled manpower, producing precision tooling and disseminating new technologies. However, sustaining and scaling up the impact is imperative to the existence of the Tool Room. This would be a major challenge given constraints like ageing technical infrastructure, lack of acquisition of new skills by the available human resource, deteriorating linkages with local MSME market, limited networking skills, low level of use of modern financial and management systems, limited managerial skills, etc.

The policy direction and monitoring indicators mainly give weightage to self-sustainability which needs to be revisited as the impact on MSMEs and job creation is of equal significance. Over emphasis on cost recovery and related financial indicators has resulted in reduced impact on the MSMEs and skill development. It is also necessary that the CTR develops an understanding of the current and emerging MSME needs (especially local clusters) on both training and tooling fronts. A formal survey of the MSME market, relevant to the CTR, is needed for this purpose. This would be essential to establish short and long-term targets with an eye on the impact.

Annexure I

Details of Visit

Details of visit of GT Team to CTR Ludhiana

Date of the Meeting	Name of the City	Details of Meetings	List of People Met	Designation
6 June 2011	Ludhiana	CTR Ludhiana	Mr. A.P. Sharma	General Manager
6 June 2011	Ludhiana	CTR Ludhiana	Mr. Sharn Pal Singh Taggar	Assistant Manager – C&M
6 June 2011	Ludhiana	CTR Ludhiana	Mr. A.K. Mittal	Senior Manager – Training
6 June 2011	Ludhiana	CTR Ludhiana	Mr. D.S. Gojra	Assistant Manager Training
6 June 2011	Ludhiana	CTR Ludhiana	Mr. Satya Prakash	Assistant Manager
6 June 2011	Ludhiana	CTR Ludhiana	Mr. U.K. Dass	Heat Treatment F/M
6 June 2011	Ludhiana	Mittal Alloys (Supplier)	Mr. Surinder Pal Singh	-
6 June 2011	Ludhiana	M.S. Bhogal N Sons (Customer)	Mr. H.P. Bhogal	Partner
7 June 2011	Ludhiana	CTR Ludhiana	Mr. K. Bighnesh	Assistant Manager (Production)
7 June 2011	Ludhiana	EEPC India (Governing Council Member and Customer)	Mr. S.C. Ralhan	Regional Chairman
7 June 2011	Ludhiana	R.M. Forging Private Limited	Mr. Ram Lagan	Chairman
7 June 2011	Ludhiana	Ministry of MSME, MSME – Development Institute (Governing Council Member)	Mr. S.S. Dhillon	Director (Punjab and Chandigarh)
7 June 2011	Ludhiana	Ministry of Labour & Employment	Mr. R. Raj	Joint Director of Training
7 June 2011	Ludhiana	CTR Ludhiana	Mr. Rajesh Jindal	Incharge Accounts

Annexure II

Training Courses

List of Short Term Courses at CTR Ludhiana		
Name of the Course	Duration	Intake
Auto CAD (Regular)	60 Hours	20
Auto CAD (Sunday)	60 Hours	15
Integrated CAD/CAM Pro-E (Regular)	120 Hours	15
Integrated CAD/CAM Pro-E (Sunday)	120 Hours	15
Integrated CAD/CAM, Solid works	80 Hours	15
Integrated CAD/CAM Master CAM	60 Hours	15
Integrated CAD/CAM , NX/ Unigraphics	120 Hours	15
Integrated CAD/CAM Catia	120 Hours	15
CNC Turning	03 Months*	06
CNC Turning	02 Months	06
CNC Milling	03 Months*	06
CNC Milling	02 Months	06
CNC Wire Cut & EDM	One Month	06
Certificate Course in Advance CAD/CAM & CNC Machines	17 weeks	10
CNC Programming & Machining	03 weeks	10
Manufacturing Automation	02 Months	10
Heat Treatment of, Plain Carbon Steels	20 hours	12-15
Press Tool Design - I	20 hours	12-15
Case Hardening of Low carbon, Plain and Alloy steels	20 hours	12-15
Plastic Injection Moulding Theory & Practice	30 hours	12-15
Press Tool Design-II	20 hours	12-15
Grinding & Re-sharpening of Cutting Tools	20 hours	12-15
Preventive Maintenance	20 hours	12-15
Basic and Advance Engineering Measurement	20 hours	12-15
Inspection Gauge Design and Making	20 hours	12-15
Jigs Fixtures Design and Making	20 hours	12-15
Basics of Pneumatics and Hydraulic	30 Hours	12-15
Rapid Prototyping	1 week	20
Machinist	Six Months	20
Turner	3 Months	20
Fitter	3 Months	20
Computer Hardware & Net Working	Two Months	10-12
Press Machine Operator	2 weeks	20

Injection Moulding Machine Operator	2 weeks	20
Electrician (Basic)	2 weeks	20
Welder (Basic)	2 weeks	20
Grinding Machine Operator	2 weeks	20
Certificate Course in Motorcycle Service & Repair (Sundays Only)	Two Months	20
Small Business Management	06 Months	20
Workshop Management	Two Months	20
Soft Skill Development	One Month	15
Development of Supervisory Skills	One Month	10
Accounting Skills for MSMEs	One Month	20
Office Automation	One Month	15
Comm. & Soft Skills	One Month	15
Certificate Course in Advance CAD/CAM & CNC Machines	17 weeks	10

Annexure III

Production Equipment

High Technology equipment in production related services		
CNC Machines	Type	Make/Model
Milling	Universal Milling Machine	DECKLE MAHO DMU 50T
Milling	CNC Milling Machine	DIALOG-11 DECKEL / FP5A
Milling	Universal Milling Machine	NC MAHO/ MH800P
Milling	Milling Machine	DECKEL FP-1
Milling	Milling Machine	DECKEL FP-4M
Milling	Universal Milling & Boring Machine	DECKEL FP-3
Milling	Turrext ram milling Machine.	HMT M1 TR
Milling	Milling Machine	HMT / FNI (H&V)
Milling	Milling Machine.	HMT/FN-2U
Milling	Milling Machine.	HMT/FN 1U
Turning	CNC Turning Center	EMCOTURN 345
Turning	CNC Lathe Machine	HMT
Turning	Precision Center Lathe	DRO GEDEE WEILER / LZ 300G
Turning	High Speed Precision Lathe	HMT NL-22
Turning	PFEIFER Lathe(1)	
Turning	PFEIFER Lathe(2)	
Wire Cut	AGIE Wire Cut	CLASSIC 25
Wire Cut	CNC Wire Cut	EDM ROBOFIL 290 CHARMILLES
Wire Cut	CNC EDM Wire Cut	ELECTRONICA- SPRINT CUT
RP	Rapid Prototyping using SLS Technology	Vanguard HS-3D systems
RP	Rapid Tooling/Silicon Moulding Vacuum Casting System	MCP-HEK
CNC CMM	Co-ordinate Measuring Machine-CMM	Carl Zeiss (Prismo 5, HTG VAST) with digitizing and reverse engineering capability
Profile Projector	-	WERTH
Micro Hite	-	TESA
Tool Maker's	-	NIKON

Microscope		
Tool Makers Microscope(Computerized control & output)	-	NIKON
Bench center	-	MAHR
Moulding	Injection Moulding	Machine Windsor / SP – 130
Moulding	Injection Moulding	L&T – DEMAG 200
Drilling	EDM Drilling Machine	
Drilling	Radial Drilling Machine	
Grinding	Surface Grinding Machine	PRAGA 451 & 452P
Grinding	CNC Universal cylinder gr. Machine.	STUDER S30 LEAN PRO
Grinding	Cylindrical grinding Machine.	SCHOUT
Grinding	Cylindrical Grinding Machine	HMT K 130 – U
Grinding	Surface grinding Machine.	ELB
Grinding	Surface & Profile Grinding Machine	JUNG / JF 520
Grinding	Tool & Cutter Grinding Machine	HMT GTC-28
Grinding	Surface Grinding Machine	KENT
Grinding	Jig Grinding Machine	HAUSER
Boring	Vertical Machining Center Bridge Port	VMC 2216
Boring	Jig Boring Machine	HAUSER / OP-3
HeatTreatment	Pit Type Furnace For Tempering	
Heat Treatment	Electrically Heated Chamber Furnace	FULMINA / KEW 10 SG
Heat Treatment	Air Circulation Furnace (Box Type)	Air Circulation Furnace (Box Type)
Heat Treatment	Electrically Heated Chamber Furnace	KGD 60 / 100 RUHSTART
Heat Treatment	Salt Bath Furnace(Oil Fired With Pre Heater)	
Heat Treatment	High heat salt bath furnace Electrode type	
Heat Treatment	Micro Hardness Tester	
Heat Treatment	Metallurgical Microscope	
Heat Treatment	Hardness Testing Machine	
Heat Treatment	Hardness Testing Machine	
EDM	CNC EDM spark erosion Machine	CHARMILLES / R 20 20
EDM	EDM Spark erosion Machine	DECKLE / DE 20
EDM	EDM drilling machine	
Press Work	Hydraulic press	NEFF URACH / RPH 10

Annexure IV

Training Equipment

Equipment in Training Department						
Machine Type	Make	Model	Max Job Wt / Specifications	Axes/Travel	Accuracy	Year of Installation
shaper	Shaper Copper	CSM - 63	Stroke Length =630mm (630 >< 500 >< 400mm)	Stroke-X axis Feed-Y axis Depth Z axis	±0.1 mm	1980
	Shaper Copper	CSM - 64	Stroke Length =630mm (630 >< 500 >< 400mm)	Stroke-X axis Feed-Y axis Depth Z axis	±0.1 mm	1980
	Shaper Copper	CSM-45	Stroke Length =450mm (450 >< 350 >< 250mm)	Stroke-X axis Feed-Y axis Depth Z axis	±0.1 mm	1980
	Shaper klopp	-	Stroke Length =450mm (450 >< 450 >< 250mm)	Stroke-X axis Feed-Y axis Depth Z axis	±0.1 mm	1979
	Shaper Copper	CSM-45	Stroke Length=450mm (450 >< 350>< 250mm)	Stroke-X axis Feed-Y axis Depth Z axis	±0.1 mm	1980
Lathes	Lath weiler Premium	-	Center Distance =80mm Center Distance =300mm	X-axis Z-axis	±0.05	1980
	Lath weiler Premium	-	Center Distance =80mm Center Distance =300mm	X-axis Z-axis	±0.05	1980
	Lathe GeeDee Weller	LZ-300	Distance =80mm Center Distance =300mm	X-axis Z-axis	±0.05	1980

	Lathe GeeDee Weller	LZ-300	Distance =80mm Center Distance =300mm	X-axis Z-axis	±0.05	1980
Lathes	Lathe GeeDee Weller	LZ-300	Distance =80mm Center Distance =300mm	X-axis Z-axis	±0.05	1980
	Lathe GeeDee Weller	LZ-300	Distance =80mm Center Distance =300mm	X-axis Z-axis	±0.05	1980
	Lathe GeeDee Weller	LZ-300	Distance =80mm Center Distance =300mm	X-axis Z-axis	±0.05	1980
	Lathe GeeDee Weller	LZ-300	Distance =80mm Center Distance =300mm	X-axis Z-axis	±0.05	1980
	Lathe HMT Chamundi		Center Distance =1000mm Center Distance =170mm	X-axis Z-axis	±0.05	1985
	Lathe HMT	NL-22	Center Distance =1000mm Center Distance =220mm	X-axis Z-axis	±0.05	1979
	Lathe GeeDee Weller	LZ-350	Center Distance =800mm Center Distance =350mm	X-axis Z-axis	±0.05	1999
	Lathe GeeDee Weller	LZ-350	Center Distance =800mm Center Distance =350mm	X-axis Z-axis	±0.05	1999
	Lathe GeeDee Weller	LZ-350	Center Distance =800mm Center Distance =350mm	X-axis Z-axis	±0.05	1999

Lathes	Lathe GeeDee Weller	LZ-350	Center Distance =800mm Center Distance =350mm	X-axis Z-axis	±0.05	1999
	Lathe GeeDee Weller	LZ-350	Center Distance =800mm Center Distance =350mm	X-axis Z-axis	±0.05	1999
Drilling	Bench Drilling Machine	-	Drilling Capacity =13mm Spindle taper MT1	Z-axis	±0.1	2000
Drilling	Bench Drilling Machine	-	Drilling Capacity =13mm Spindle taper MT1	Z-axis	±0.1	2000
Drilling	Bench Drilling Machine	-	Drilling Capacity =13mm Spindle taper MT1	Z-axis	±0.1	2000
Drilling	Bench Drilling Machine	-	Drilling Capacity =13mm Spindle taper MT1	Z-axis	±0.1	2000
Drilling	Bench Drilling Machine	-	Drilling Capacity =13mm Spindle taper MT1	Z-axis	±0.1	2000
Drilling	Pillar Drilling Machine	-	Working Capacity = ø 25mm	Z-axis	±0.1	2000
Drilling	Pillar Drilling Machine	-	Working Capacity = ø 25mm	Z-axis	±0.1	2000
Drilling	Pillar Drilling Machine	-	Working Capacity = ø 25mm	Z-axis	±0.1	2000
Drilling	Pillar Drilling Machine	-	Working Capacity = ø 25mm	Z-axis	±0.1	2000
Milling	Milling Machine	FN2U	Table Movement (X x Y x Z) = 800 x 265 x 400 mm	X-axis Y-axis Z-axis	±0.05	1984

Milling	Table Size = 210 x 360mm Adjustment Ratio Modle Size = 320 x 450mm 1:1.5 - 1:10	MITR - New	Table Movement (X x Y x Z) = 760 x 305 x 400 mm	X-axis Y-axis Z-axis	±0.05	1985
			Table Movement (X x Y x Z) = 560 x 250 x 375 mm	-	-	-
Milling	Milling Machine	FNIPH	Table Movement (X x Y x Z) = 560 x 250 x 375 mm	X-axis Y-axis Z-axis	±0.05	1979
Milling	Milling Machine	FNIIH	Table Movement (X x Y x Z) = 560 x 250 x 375 mm	X-axis Y-axis Z-axis	±0.05	1983
Milling	Milling Machine	MITR - Old	Table Movement (X x Y x Z) = 760 x 305 x 400 mm	X-axis Y-axis Z-axis	±0.05	1984
Milling	Deckel Milling Machine	FNIPV- New	Table Movement (X x Y x Z) = 560 x 275 x 375 mm	X-axis Y-axis Z-axis	±0.05	1985
		FPIV	Table Mvment (X x Y x Z) = 500 x 400 x 400 mm	X-axis Y-axis Z-axis	±0.05	1984
Milling	Milling Machine	FNIU	Table Movement (X x Y x Z) = 560 x 275 x 300 mm	X-axis Y-axis Z-axis	±0.05	1984
Milling	Milling Machine	FNIPV- Old	Table Movement (X x Y x Z) = 560 x 275 x 375 mm	X-axis Y-axis Z-axis	±0.05	1979
Milling	Milling Machine	FNIV - NEW	Table Movement (X x Y x Z) = 560 x 275 x 375 mm	X-axis Y-axis Z-axis	±0.05	1997
Pentagraph	---	Old	Table Size = 210 x 360mm Adjustment Ratio Modle Size = 320 x	X-axis Y-axis Z-axis	±0.05	1981

			450mm 1:1.5 -1:10			
	Pentagraph	New	-do-	X-axis Y-axis Z-axis	±0.05	1993
Surface Grinder	Surface Grinder	Praga 452-	Table Movement 450 x 150mm Grinding Height = 280mm	X-axis Y-axis Z-axis	±0.01	1999
Surface Grinder	Surface Grinder	Praga 451	-do-	X-axis Y-axis Z-axis	±0.01	1981
Surface Grinder	Surface Grinder	Praga 452- New	-do-	X-axis Y-axis Z-axis	±0.01	2002
Surface Grinder	Surface Grinder	ELB	Table Movement = 400 x 200mm	X-axis Y-axis Z-axis	±0.01	1980
Surface Grinder	Surface Grinder	GAMT	Table Movement =500 x 200	X-axis Y-axis Z-axis	±0.01	1984
Cylindrical Grinder	Cylindrical Grinder	K - 130 Old	Max. Grinding ø 125mm Grinding Height = 550mm	X-axis Y-axis Z-axis	±0.01	1979
Cylindrical Grinder	Cylindrical Grinder	K - 130 - New	-do-	X-axis Y-axis Z-axis	±0.01	1997
Cylindrical Grinder	Cylindrical Grinder	GCU - 200	-do-	X-axis Y-axis Z-axis	±0.01	1987
Tool & Cutter Grinder	Tool & Cutter Grinder	1st	Max. Grinding Height = 280mm	X-axis Y-axis Z-axis	±0.01	1980

Tool & Cutter Grinder	Tool & Cutter Grinder	2nd	-do-	X-axis Y-axis Z-axis	±0.01	1984
Pedestal Grinder	Pedestal Grinder	-	Wheel Diameter = 300 x 50mm	X-axis Y-axis	±0.5	1980
Pedestal Grinder	Pedestal Grinder	-	-do-	X-axis Y-axis	±0.5	1980
Pedestal Grinder	Pedestal Grinder	-	-do-	X-axis Y-axis	±0.5	1980
Pedestal Grinder	Pedestal Grinder	-	-do-	X-axis Y-axis	±0.5	1980
Fly Press	Fly Press	-	290 x 250 x 300mm	Z-axis	±0.2	1986
Fly Press	Fly Press	-	420 x 400 x 550mm	Z-axis	±0.2	1986
Hand Press	Hand Press	-	Height = 300mm	Z-axis	±0.2	1986
-	Filing & Sawing Machine	-	Filing 100 x 400 x 400mm Sawing = 200 x 450mm	Y-axis Z-axis	±0.5	1979
-	CNC Lathe MACHINE	- Emco 345	Center Distance = 1000mm Center Distance = 260mm	X-axis Z-axis	±0.02	1979
-	Single Bench Work (92)		Size 6'x3'x2.5'	X-axis Y-axis Z-axis	±0.1	1979
Turning	CNC train master	M Tab	-	X-axis Z-axis	±0.01	2010

Wire Cut		Electronica	-	X-axis Y-axis Z-axis	± 0.02	2002
CNC Die sinking		Electronica	-	X-axis Y-axis Z-axis	± 0.02	2007
CNC Die sinking	-	-	-	-	-	-
Mould Polishing	-	-	-	-	-	-
RP	-	-	-	-	-	-
CNC CMM	-	-	-	-	-	-
Audio visuals	-	-	-	-	-	-

Annexure V

Training organised for CTR employees

Sl. No.	Designation	Number	Subject
1	Manager Training	1	Operation of CNC Machines and Programming with CAD/CAM
2	Assistant Manager Training	2	
3	Assistant Manager Production	1	
4	Assistant Manager Design	1	
5	Assistant Manager Heat Treatment	1	
6	Design Assistant Grade I	1	Computer Aided Design
7	Design Assistant Grade II	1	
8	Technicians Grade I	22	Operation of CNC Machines
9	Technicians Grade II	15	
10	Technicians Grade III	20	



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