Machine Tool Cluster: Indian Experience

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Abstract
Industriallyzing economy looks for the development of supporting systems. Technology grows when they are put into action in the sense that has more utility. Technological change and resulting industrialization requires support of machine tools. Multiplier effect of industrialization creates scope for machine tools. However economics of such sub-systems have to be viewed as a small industry, under microeconomic perspectives. Such an attempt is made in this paper. The paper examines the growth and working of Bengaluru Machine tool cluster. It examines the reasons for its success and the potential for the cluster to grow. It identifies the need for clustering of the small scale units. Clustering helps in the growth of the small scale firms in facing global competition. The study highlights the achievements of the cluster and the areas that need to be developed by the cluster which enhance the growth and productivity of the member firms. It concludes that with few shortcomings and challenges, the cluster has a great potential to develop.

Keywords: Machine Tool cluster, Cluster, Machine tools, BMTMN, Bengaluru Machine Tools

INTRODUCTION
Economic development results from resource base and their utilization. Identification of resources and the ways for their utilization brings in expansion of the activity. Emphasis on the main sectors of the economy, acts as a driving force in the expansion of economic activity. Industrial development is important for utilization and expansion of economic activity and economic development. Development of basic industries of which capital good sector is important is essential for sustained industrial and economic development. In this process, the role of Micro, Small and medium enterprises (MSME) in economic development of a country is well established. In India as per the report of the task force on MSME 2009, MSME sector contributes 8 percent of the country’s Gross Domestic Product, 45 percent of the manufactured output and 40 percent of its exports. Recognizing the importance, Indian planners since independence have always provided incentives and encouragements to these units. A small and medium enterprise is declared as priority sector for lending in commercial banks in the urban areas. The reforms in 1991 opened up the industrial sector for international competition. Indian industries did well to face the global competition after initial hiccups.

Several committees were formed by the government to study the problems of MSME’s after 1991 reforms. Abid Hussian Committee 1997 in its report suggested the identification and development of industrial clusters. Clustering of industrial enterprises is a phenomenon prevalent world wide. Developing countries have to adopt clustering motivated by its success in the developed nations. Government adopted cluster development project. Apart from the central government, state governments, national support institutions like Small Industries Development Bank of India (SIDBI), State Bank of India – Integrated Technology Upgradation and Management Programme (UPTECH) programme, National Bank for Agriculture And Rural Development (NABARD), United Nations Industrial Development Organization (UNIDO), National Small Industries Corporation (NSIC), KVIC, Coir Board and others also aimed at promoting cluster development. Though initiatives for cluster development in India started after 1997, literature on industrial clusters is traced back to Neo classical times and Alfred Marshall. Marshall identifies the external economies of scale of which economies of localization or concentration is one of the important external economies. Porter’s concept of clustering strategies as a way of accelerating economic development is widely acknowledged as effective. Need for industrial clusters arise from the fact that competitive industries do not develop in isolation.

Porter defines industrial cluster as “geographically proximate groups of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities”. Clusters are of two types: artisanal cluster and industrial cluster. Porter identified the following characteristics of Clusters.

3 Jircikova Eva (2010) cluster as a tool for increasing the performance of companies: Good practices used by selected clusters, in Business Clusters: partnering for strategic advantage, TBU publications, pp 88-105
Selection of clusters for development was based on (a) importance of the cluster (b) existing of critical gaps (c) viability of the cluster (d) vibrancy of the local industry association and (e) social and environment considerations.

Considering the above criterion for cluster development programme, different organizations adopted clusters for development. In this process UNIDO adopted 45 clusters, Small Industries Service Institute (SISI) adopter 21 clusters, SIDBI 20 clusters, SBI- UPTECH programme adopted 15 clusters apart from 11 clusters adopted by SBI with the partnership of UNIDO, NSIC adopted 10, SIDO 28 clusters and NABARD adopted 32 clusters. Few of the State Governments also showed interest in the cluster development programme. Gujarat and Rajasthan were prominent among them.

Machine tools industry is an important sector which influences the level of technology in the manufacturing sector. Bangalore and Mumbai-Pune clusters together hosts almost 57 percent of the machine tool firms. The contribution of Bangalore to the total output is about 60 percent of the total machine tool output. Importance of the two clusters can be seen by looking at the distribution of machine tool firms in India.

Table 1 Distribution of Machine Tool firms in India (in Percentage)

<table>
<thead>
<tr>
<th>Sl no.</th>
<th>Location</th>
<th>Percentage of firms in the area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mumbai and Pune (Maharashtra)</td>
<td>29</td>
</tr>
<tr>
<td>2</td>
<td>Bangalore (Karnataka)</td>
<td>28</td>
</tr>
<tr>
<td>3</td>
<td>Batala, Jalandhar and Ludhiana (Punjab)</td>
<td>14</td>
</tr>
<tr>
<td>4</td>
<td>Ahmedabad, Baroda, Rajkot, Jannagar and Surendranagar (Gujarat)</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>Coimbatore and Chennai (Tamil Nadu)</td>
<td>7</td>
</tr>
<tr>
<td>6</td>
<td>Delhi</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>Andhra Pradesh</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>Haryana</td>
<td>2</td>
</tr>
</tbody>
</table>


Vijay Kumar Kaul (2002) in his analysis of innovative clusters emphasized the role of clusters in innovation and learning. Though the role of User-producer interaction has been a main source of technology transfer in the capital good sector, a network of business service providers, the clustering of inputs, institutes involved in research and development, and face to face interaction of the manufacturing firms also help in technology transfer. The paper mainly analyzed the software clusters world over and how innovations have occurred in these clusters.

### INDIAN SCENARIO

In the Indian context, clusters was defined by the knowledge team in the Ministry of Small Scale Industries as “Sectoral and geographical concentration of enterprises, in particular Small and Medium Enterprises (SME), faced with common opportunities and threats which can give rise to external economies, favor the emergence of specialized technical, administrative and financial services; create a conducive ground for the development of inter-firm cooperation and specialization as well as of cooperation among public and private local institutions to promote local production, innovation and collective learning.”

Recognizing the importance of cluster development, the Government of India under the ministry of small scale industries, set up a knowledge team to identify numerous clusters and conduct a diagnostic study of the clusters identified. The study team found 6500 artisan, industrial and micro clusters in India. It also estimated that 60 percent of the manufactured exports are from these clusters.

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4 Krugman (1991), History and industry location: The case of the manufacturing belt, American Economic review, vol.81, No 2, pp 80-83.
Considering the concentration of the Machine tool firms in India in different locations, ICAMT recognized 6 Machine Tool (MT) clusters each managed by separate ICAMT Technical Expert. Bangalore cluster consisted of 15 units, Pune cluster 20 units, and Ludhiana cluster 10 units, Rajkot cluster 25 units Hyderabad cluster 10 units and Delhi NCR 10 units. Maharashtra has the highest concentration closely followed by Karnataka.

The objective of the International Centre for the Advancement of Manufacturing Technology Machine Tool (ICAMT MT) project is to

- Strengthen the competitiveness of the Indian Machine Tool industry
- Enhance cost effective production of high quality machine tools through technology upgradation
- Enhancing the share of Indian Machine Tool industry in the global market.

ICAMT MT

ICAMT developed key performance indicators and the MT sector closely monitored. We shall now consider one of the Machine Tool sector, for our study. Machine tool sector can be classified into two based on how the metal is shaped:

Metal forming machine tools and Metal cutting machine tools.

Metal cutting machine tool segment accounts for 87 percent of the total output of the industry. Based on how the movement is controlled, the industry can be classified into conventional machines and Computer Numerically Controlled (CNC) machine tools. Formation of IMTMA was the first step in cluster development. Indian Machine Tool Manufacturers Association (IMTMA) was formed in the mid 1970’s and the first Indian Machine Tool Exhibition (IMTEX) was held in 1979. IMTEX is a window to technology, markets, new ideas, opportunity for showcasing capabilities of firms.

Bangalore Machine tool forms an important component in Indian Machine Tool sector both in terms of numbers and output. 28 percent of the machine tool manufacturers are located in Karnataka, Bangalore. Bangalore contributes over 60 percent of the total output of the industry and is a home for four of the top ten largest players of machine tools. Bangalore machine tool is mainly a metal cutting machine tool segment.

With this background this paper attempts to analyze the experience of machine tool cluster in India which is an important sector influencing the technological capabilities of the manufacturing sector. The Bangalore machine tool cluster was adopted by UNIDO.

Statement of the Problem

Machine tool sector is considered as an important sector in the manufacturing sector which influences the productivity and quality of the entire manufacturing sector. The sector is dominated by a large number of small scale firms. Cluster development has been an important initiative to develop the competitiveness of the small scale sector. The paper examines the experience of the machine tool cluster in India.

Objective

1) To analyze the Indian Experience in Machine Tool cluster.
2) To examine the organizational structure, programmes and benefits from Machine tool clusters.

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5 Unido cluster report.


7 IBEF. Machine Tools- Market and opportunities- a report by KPMG for IBEF: www.ibef.in
METHODOLOGY

The paper uses both primary and secondary data. The first objective of this paper is arrived by analyzing using secondary data followed by a case study of machine tool cluster in Bangalore city. Bangalore machine tool cluster is analyzed using primary data.

Sample and Sample Size

Bangalore machine tool cluster which is called as Bangalore Machine tool manufacturers association (BMTMN) consist of 12 members. A sample size of eight members is selected in random and the questionnaire was advocated to record their perceptions about the cluster.

Bangalore Machine Tool Industry

Machine tool cluster was one of the important clusters identified. UNIDO adopted cluster development programme for the machine tool industry in India. International Centre for the Advancement of Manufacturing Technology (ICAMT) India as a cluster development project under UNIDO started the programme in 2002. Second phase was initiated in 2009. According to the UNIDO evaluation group this was a sector where substantial headway has been made.

Bangalore machine tool cluster was adopted by UNIDO. Before we examine the Bangalore machine tool cluster and its working, it is essential to briefly know the development of Machine Tools in Bangalore.

Machine Tool Sector in Bangalore

Bangalore contributes almost 60 percent of the total machine tool production in India. It is therefore called the hub of machine tool industry. The history of machine tool in Bangalore begins with the setting up of Hindustan Machine Tools (HMT) in 1953. Mysore Kirloskar was set up in Harliar in 1941. A number of small and medium scale firms were set up around HMT and Peenya. Bharath Fritz Werners (BFW) was established in 1958 which furthered the development of MT in Bangalore.

Public sector establishments such as Bharat Electrical Limited (BEL), Bharat Earth Movers Limited (BEML), Bharat Heavy Electrical Limited (BHEL), Indian Telephone Industry (ITI), Indian Space Research Organization (ISRO), etc gave a boost to the development of machine tools in Bangalore. Much required testing and R&D needs were met by Central Machine Tool Institute (CMTI) which was established in 1962. Development of Peenya industrial estate in the late 1970’s which hosts a large number of engineering industries was another factor which nurtured the development of machine tool industries in Bangalore. HMT pioneered the growth of machine tool industry in Bangalore. It set up a support system for the entire machine tool industry by setting up ancillaries and providing opportunities for a wide range of suppliers.

By 1970’s Bangalore emerged as a major machine tool producer contributing 50 percentage of the value of machine tool production in the country. HMT alone contributed almost 35 percent of the total machine tool output. Bangalore which is a machine tool hub started clustering even before UNIDO incentive recognizing the need for cluster development. Many firms in the private sector came up in 1980’s of which Ace designers was important. Most of the firms started during 1980’s are technocrat led firms. Wadia added machine tools to its business line. These furthered the growth rate and upgradation of technology across the cluster.

Clustering of machine tool firms was individually developed by the Ace’s group in 1990’s. Ace designers started expansion of their products and developed into three units which specialized in the production of different machines. Some of the firms which produced accessories joined with the Ace’s group and formed a marketing cluster where a marketing firm was established for common marketing which includes sales and services of all the products. UNIDO found clustering of machine tool firms especially in small firms easier in Bangalore therefore; UNIDO initiated the formation of official cluster in Bangalore.

Bangalore Machine Tool Manufacturing Network

Bangalore Machine Tools Manufacturers Network (BMTMN) was formed in 2002 as a response to the UNIDO initiative. The small entrepreneurs were handpicked to be the cluster members. The main objective of selection was that the firms are complementary, non-competing firms. Even to this day membership is by invitation. BMTMN has the objective to share the success of each company and integrate into its members. It is basically a business management cluster.

UNIDO support ended in 2011. BMTMN was basically started to reap the benefits of the grants in UNIDO in 2002. Bangalore Machine tool cluster was adopted by UNIDO for two terms. Presently it is not a UNIDO cluster, still BMTMN as an organization is going strong due to the trust that has developed between members over time. Members recognize the benefit that they reap by being together. UNIDO has given a direction of development of the cluster. Its interventions and directives have hugely benefited its members. Of the 12 members, 11 firms are located in Bengaluru and one firm in Mysuru. It has a simple organizational structure. Being a small cluster with just 12 members, simple organizational structure is sufficient.
Organizational Structure
BMTMN has a small and simple organization structure. It is led by the President, who is normally elected unanimous. As the number of members is small there has been unanimity among members and all the members are selected as President by turns. The President is assisted by a Secretary and Joint Secretary. Members by discussion select the President, Secretary and Joint Secretary. The Secretary of the organization succeeds the President. The joint secretary assists the secretary in organizing events and meetings. Every member will be involved in organizing events for two years. The post of Joint Secretary is introduced in recent years to enable the cluster to involve second generation entrepreneurs in the organization.

Figure -2 organizational structure of the cluster

The president chairs all the meetings. He takes the lead role in organizing the events in the organization. Secretary coordinates the logistics of speakers and supports the president in organizing events. Division of work is more informal and the President, Secretary and the Joint Secretary with the coordinator share the work. Accounts of the income and expenditure of the cluster is maintained by the coordinator. The accounts are verified and cross verified by the Secretary. President, Secretary and Joint Secretary has the right to sign the cheque. Two signatures are essential for the bank. Cheques are normally signed by the President and the Secretary; Joint Secretary will sign when the Secretary is not available. As all the members are entrepreneurs, and find it difficult to spare time in conducting the programmes, a coordinator is appointed by BMTMN. The coordinator is responsible for the smooth working of the programmes. The coordinator also communicates with all the members in organizing events.

Programmes of BMTMN
Being a UNIDO cluster, UNIDO started with some of the management development programmes. A delegation of entrepreneurs was sponsored to visit and study Chinese Machine tool industry. Members opined that the Chinese Machine tool was technologically low. It is yet to catch up with the global world. Still the government support for acquiring and learning technology was very high. Still it cannot be ruled out as a potential competitor for Indian Machine Tool industry as they can acquire technology with government support. This is happening in recent times as it is few years past after this visit. One of the members appreciated the free hand given by the government to the firm to acquire and implement new practices in developing the firms in China. India has an edge over China in technology and entrepreneurship, but very little government support. Members felt that clustering will help them face competition even with little government support.

UNIDO under took various programmes to develop this cluster. Most of the programmes are related to working practices. Management development programmes for CEO levels and middle management was very helpful for attitude change in the SSI’s as these firms are primarily CEO run companies. A programme on lean manufacturing systems was very successful. 80 percent of the sample firms mentioned that it had experienced enhancement of productivity as a result of adopting lean manufacturing system. The cluster employed a common consultant for implementing the programme in the member firms, based on the primary data.

Table-2: Response of the members about Usefulness of UNIDO Programmes

<table>
<thead>
<tr>
<th>Programmes</th>
<th>Very Useful</th>
<th>Useful</th>
<th>Moderate</th>
<th>Can be improved</th>
<th>Poor</th>
<th>Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management development programmes</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td></td>
<td>4.25</td>
</tr>
<tr>
<td>Lean manufacturing system</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td>4.5</td>
</tr>
</tbody>
</table>

Programmes after UNIDO Support Ended
After UNIDO support ended, the cluster remained to work and chalk out programmes which are required by all the firms in common.

Cluster members recognize that Small Scale Industry’s (SSI) as individual firms have low bargaining power in respect of price of inputs, negotiation with banks and Government. The some of the members of the cluster have many common vendors, common purchase of inputs. The members negotiate and have common vendors when they have the purchase of common accessories or components. Negotiating as a group increases their bargaining power and the vendor also benefits as he can produce in bulk. As some members manufacture unique products, common purchase of inputs by all the members is not possible.
Most of the members opined that they are benefited by the brain storming sections in the meeting. The members share their problems with each other and try to find solutions to the problems. Experiences of the senior entrepreneurs help the members in solving problems. Certain problems are unique for the firms, in such cases, discussion and different suggestions help the member firm in solving the problems. Some problems may be faced by one firm previously which is faced by another firm presently; the firms share their experience as to how they were able to solve the problem which helps the firms to deal with their problems.

Table -3 Response of the members about various activities of the cluster

<table>
<thead>
<tr>
<th>Programmes</th>
<th>Very Useful</th>
<th>Useful</th>
<th>Moderate</th>
<th>Can be improved</th>
<th>Poor</th>
<th>SCORES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sharing problems with members</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
<td>4.37</td>
</tr>
<tr>
<td>Sharing success stories of other members</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td></td>
<td></td>
<td>4.25</td>
</tr>
<tr>
<td>Visiting the firms of other members</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td></td>
<td></td>
<td>4.25</td>
</tr>
<tr>
<td>Common consultant</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td></td>
<td></td>
<td>3.8</td>
</tr>
<tr>
<td>Joint marketing</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td></td>
<td></td>
<td>1.62</td>
</tr>
<tr>
<td>Joint participation in exhibitions</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td></td>
<td></td>
<td>3.37</td>
</tr>
</tbody>
</table>

Sharing Problems among Members

They also share the success of each company and induce other members to attain the success. Sharing of success of firms motivate other firms to implement novel ideas for business success. Though members feel that it is just a motivator and nothing else, it has motivated few firms to venture into exports by seeing the success of other companies.

BMTMN website has been created and websites of individual companies are also created by joint negotiation. Web presence is an important tool in business to business (B2B) marketing. Creation of websites will go a long way in improving the business of the firms.

The cluster members meet every month in the factory of a member firm. The host firm is selected by turns. Some of the firms felt that visiting other firms has also helped them in gaining knowledge about the good practices followed in the member firms. The expense of the cluster is met by equal sharing. The members pay a fee every month to meet the expenditure of the cluster. When an additional expense such as a development programme, launching of web site is made, the members share the expense equally.

Promotion of exports is another objective that was achieved. Sharing of existence of potential markets, sharing of procedure for European Conformity (CE) certification, which is essential to export to European countries, Underwriters laboratories (UL) certification an American safety consulting required to export to United States of America and International organization for standardization (ISO) certification procedures. Of the 12 firms, 6 firms were exporters before they became members of the cluster. This induced the other firms to export their products. 2 firms started exporting after they became members of the cluster. Sharing knowledge helped these firms in achieving their objective.

Common consultancy for the adaptation of lean manufacturing programme, zero defect consultancies was another programme which helped the firms to slim their cost of production. Some of the member firms have not adopted the lean manufacturing programme. Those firms which have adopted have benefitted.

The member firms have grown together in global business. Individual firms share information about potential markets. Some of the firms have individual offices in some countries the experience of which is shared with the cluster members. Though efforts are made for joint marketing, the member firms feel it is difficult as the products are different.

Common participation of cluster members in international exhibitions is another initiative in the cluster. Some of the member expressed that they had not thought about participating in international exhibitions abroad. They were able to participate as a group in the exhibitions organized by the developed countries. The members feel that there are some advantages and disadvantages in joint participation. Joint participation helps in getting space easily; expense sharing, etc. where as focus on customer and product will be less. Too many products and customers will dilute the business. Therefore member firms participate individually in focus exhibitions and jointly in less matured markets.

BMTMN has a strong feed back system. Success and initiatives taken up by BMTMN is based on the wish list in AGM. Based on the wish list of the members, the president and the Secretary look into the feasibility and chalks out the annual programme. Success of BMTMN after UNIDO has withdrawn in
2011 is due to the trust between member that has developed over time and the benefits reaped by the members.

Areas That Need To Be Developed
Though intra member business developed after the formation of cluster, it still remains low. Success of the cluster is more because of sharing the experience, success and helping each other in problem solving. Technology transfer to individual firms by sharing knowledge and information on new technology has helped member firms. Technology transfer is to a limited extent. Common purchase of inputs by few members of the cluster has helped the member firms to buy inputs at lower price.

Setting up of Sales and service office jointly in Europe by is one of the major goals of the cluster members. Joint marketing is an area where the cluster has failed. Major drawback in this area is that firms are producing unique products and therefore their customer base differs. Secondly, they have different brand names, and a serious effort is not made in this direction as some members would like to maintain their uniqueness.

Negotiating with Banks on the service charges charged by banks and on the rate of interest in rediscounting was intended by the cluster. Negotiation with nationalized commercial banks was not possible as they have stringent rules which cannot be relaxed by the bank managers or even the higher authorities. Some of the cluster did try to negotiate with the private banks in this regard. This goal did not succeed as all the firms could not change their banks they were dealing due to different reasons like good relations with the bank manager, dealing with a particular bank for a long time, etc.

To know the actual performance on the usefulness of the programmes of the cluster, total performance score of the cluster is shown in the table below.

<table>
<thead>
<tr>
<th>SL NO</th>
<th>PROGRAMMES</th>
<th>Average scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sharing problems with members</td>
<td>4.37</td>
</tr>
<tr>
<td>2</td>
<td>Visiting the firms of other members</td>
<td>4.25</td>
</tr>
<tr>
<td>3</td>
<td>Sharing success stories of other firms</td>
<td>4.25</td>
</tr>
<tr>
<td>4</td>
<td>Management development programmes</td>
<td>4.25</td>
</tr>
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</tr>
<tr>
<td>6</td>
<td>Common consultant</td>
<td>3.8</td>
</tr>
<tr>
<td>7</td>
<td>Joint marketing</td>
<td>1.62</td>
</tr>
<tr>
<td>8</td>
<td>Joint participation in international exhibition</td>
<td>3.37</td>
</tr>
<tr>
<td>9</td>
<td>Total performance score of the cluster</td>
<td>3.80</td>
</tr>
</tbody>
</table>

Source: Field Survey

Interpretation and Suggestion
The scores shows the level of success achieved in the various programmes conducted. We find the cluster is moderately successful. Some areas need serious efforts to succeed. An important area of failure is that of joint marketing. Reason for the failure for joint marketing is attributed to the diversity or unique machines manufactured by some of the firms. They fail to find common customers or even related customers. Even with these differences, joint marketing can be pursued by few firms and also firms who manufacture specialized machines. This can be done by hiring common marketing personnel who takes care of sales and services for the entire cluster.

Joint participation in exhibition also has low scores which have to be addressed to be developed by the cluster. Joint participation with one stall may reduce focus on the customer, but traveling together, sharing of hotel rooms, printing single brochure for all the products saves costs for the firms. Registering and getting space in international will be easier and will be given priority when applied as a group.

Common consultancy in different areas was proposed by the members. This can be solved by discussing and finding a more acceptable consultant. Some members expressed unhappiness over the efficiency of the consultant. If this problem is addressed, and the efficiency of the consultant improved, the programme could be a success.

Programmes on management development and lean manufacturing have helped most of the firms. More programmes which are related to capital good sector can be organized by the cluster to enhance productivity and reduce cost. Some members felt the programme is bookish. Cluster can organize programmes from experts who have experience in the industry and with a management background to enhance the possibility of implication and useful to the members.

Sharing the success and problems faced by the firms and visiting the members firms are less critical either for improving productivity or marketing. These areas though less critical are more successful than the critical areas.

SUGGESTION
More emphasis should be laid in overcoming the hurdle for group marketing and hiring consultants. Common Management consultant in the cluster may help the cluster members in improving productivity and providing most appropriate management solutions for machine tool sector in particular.

The cluster requires to organizing more technical development and management development programmes to enhance productivity and update technology. Most important aspect in the Machine tool sector is technology, and no programmes related to technology up gradation is conducted by the cluster. This is an important area which requires attention by the cluster.
CONCLUSION
The study reveals that BMTMN as a cluster initiative has succeeded to a large extent, but there is huge potential for the cluster to develop. UNIDO report also claim that the cluster development initiative was a great success in Bengaluru. Research finds that the success of the cluster is less that what is claimed by UNIDO.

The researcher finds that the development of intra member business has huge potential. More firms can also be included as the other firms in the SSI sector can benefit. Increase in number can help in exerting pressure on the government in policy formation and help from the government.

Development of professional marketing could help in common marketing. As consultants are commonly employed, professional marketing agencies can be employed for the cluster firms to promote their product overseas. This could help the SSI’s to lower cost of marketing and at the same time promote exports.

One of the important elements in export promotion is after sales service. This cannot be common as the products are different though closely related. This is a big challenge faced by the firms in establishing common sales and service overseas. BMTMN as a machine tool cluster has huge potential to succeed and develop the small scale machine tool firms to become more competitive.

LIMITATION OF THE STUDY
The paper analyses one particular cluster in Bangalore. The conclusions are limited to the machine tool cluster- BMTMN. Working and priorities of different clusters differs based on the type of products produces by the firms therefore the conclusions cannot be generalized.

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