Technology Innovation Issues Affecting Small Firms Performance

Davinder Singh, Dr. J. S. Khamba, Dr. Tarun Nanda

Dept. of Mechanical Engineering, Punjabi University, Patiala, Punjab, India
Dept. of Mechanical Engineering, Thapar University, Patiala, Punjab, India

Abstract

MSMEs in India are very important to economic growth and considerably essential to generate employment as in many developing countries. MSMEs not only play crucial role in providing large employment opportunities at comparatively lower capital cost than large industries but also help in industrialization of rural & backward areas, thereby, reducing regional imbalances, assuring more equitable distribution of national income and wealth. MSMEs sector contributes 8% of India GDP, generating 45% of manufactured output and 40% of exports. However, MSMEs growth rate is still at low level. MSMEs in the beginning of R&D activities always face capital shortage and need technology assistance. So it becomes necessary for organizations to become technology intensive to meet continuously changing global market and fulfills customer needs. Therefore in present work an attempt has been made to identify key issues of MSMEs which affect technology innovation. Such main issues that are identified in the present study are: 1) Entrepreneurship Development, 2) Financial Management, 3) Technological Co-operation and 4) Employee Empowerment.

Keywords

Micro Small and Medium Enterprises (MSMEs), Technology Innovation, Co-operation, Performance

I. Introduction

A. General

Micro, Small and Medium Enterprises (MSME) sector has emerged as a highly vibrant and dynamic sector of the Indian economy over the last five decades. MSMEs not only play crucial role in providing large employment opportunities at comparatively lower capital cost than large industries but also help in industrialization of rural & backward areas, thereby, reducing regional imbalances, assuring more equitable distribution of national income and wealth. MSMEs are complementary to large industries as ancillary units and this sector contributes enormously to the socioeconomic development of the country [1]. MSMEs contribution is highly remarkable in the overall industrial economy of the country. In recent years the MSME sector has consistently registered higher growth rate compared to the overall industrial sector. With its agility and dynamism, the sector has shown admirable innovativeness and adaptability to survive the recent economic downturn and recession. In Indian market, MSMEs rapid growth could be seen as Indian entrepreneurs are making remarkable progress in various Industries like Manufacturing, Precision Engineering Design, Food Processing, Pharmaceutical, Textile & Garments, Retail, Agro and Service sector. The sector not only serves for urban market but also helps in industrialization of rural and backward areas, reducing regional imbalances and assuring more equitable distribution of national income and wealth. MSMEs complement large industries as ancillary units and contribute enormously to the socioeconomic development of the country [2].

B. MSME’s Contribution to Indian Economy

Growth of the Indian economy has accelerated to 8% and efforts are on to further propel it to 10%. Undoubtedly, all the segments of the economy, viz. agriculture, industry and services have to improve their contribution to the economy. Growth of Micro-Small and Medium Enterprises (MSMEs) is a sine qua non for the growth of industry, exports and other segments of the economy. Furthermore, promotion of entrepreneurship is also vital for sustenance and upward movement of the current growth trajectory of the economy. The MSME sector acts as a catalyst in upholding and encouraging the creation of the innovative spirit and entrepreneurship in the economy, thereby helping in laying the foundation for rapid industrial development. Moreover, the sector also serves the vital objectives of employment generation and balanced regional development. Globalization and liberalization of the Indian economy have also brought a host of opportunities for the industrial sector, particularly the MSME segment. While MSMEs have responded to competition reasonably satisfactorily, there is scope for increasing their export potential, domestic market share and developing them as serious players in the global value chain. MSMEs represent the largest proportion of the manufacturing sector in every country. In India, 95% of the industrial units are in small- scale sector with 40% addition in the manufacturing sector and 6.29% contribution to the Indian Gross Domestic Product [3].

C. Technological Innovation (TI)

The origin of the word “innovation” comes from the Latin words “innovatio” or “innovo.” Both words mean to “renew or to make something new” [4] lead to several conclusion of its deeper meaning. It replaces old concept or products with new ones, continually updating and improving them. When introducing a new concept such as technology into the meaning of innovation and defining term “Technology Innovation”, it divided into three parts:

• Invention-Generate or realise a new idea based on technology, capability or knowledge.
• Realisation-Develop this into a reality & product.
• Implementation-Diffuse implement and market this new idea, technology, capability or knowledge.

Schumpeter [5] identified five sources of innovation: the introduction of a new good or a new quality of goods, the introduction of a new method of production, the opening of a new market, the conquest of a new source of raw materials or half-manufactured goods, and the process of carrying out a reorganization of any industry. It is also defined as the introduction of new or improved processes, products or services based on new scientific or technical knowledge and/or organizational know-how [6]. The innovativeness of an economy can be augmented through a system of specialization where larger or more mature firms acquire innovative and successful smaller firms [7]. To connect societal input to innovation in relation to the external environment of the firm, early studies assumed that growth in the short run was largely driven by capital investment, while long-term...
growth was attributed to exogenous technological change [8]. Romer [9] postulated that R&D leads to the creation of knowledge, which may have a direct impact on technological change.

1. Barriers to Technology Innovation (TI)

Number of studies shows that firm differences in barriers to innovation are related to cost, institutional constraints, human resources, organizational culture, flow of information, and government policy. Support of employees for changes in their firms depends on the kind of innovation implemented. While changes in the organization of work that are introduced independently of investments in new machinery are encountered by resistance, investments in new machines, production sites, etc. are supported by employees. It is not always a barrier against innovation but it may retard or change the innovation plans [10]. Madrid et al. [11] emphasized on a resource-based view of organizations. They introduced financial resources, human resources and external resources as barriers to innovation.

Understanding of economic risks associated with innovation activities would have a low degree of association with firms’ activity in innovation activities [12]. The most financial theories such as transaction cost theory and agency theory linked risk and financial exposure, in the way that with higher risk being associated with higher financial exposure and lower risk with lower financial exposure [14]. Transaction cost theory analyses the fact that the intangibility and specificity combined with investment in technology, by increasing transaction costs, may decrease the firms’ propensity to financing innovation with debt. Agency theory argues that the high risk of innovative activities and the existence of information asymmetries can increase problems with debt financing. An increase in debt may lead to an increase in conflicts between lenders and the firm. Several previous studies point to the negative influence of debt on innovation activity [15].

Silva et al. [16] defined nine barriers to innovation as:

- The high economic risk
- The high cost of innovation
- The lack of financing
- The organizational rigidities
- The lack of skilled personnel
- The lack of information about technology
- The lack of information on market
- The lack of customers responsiveness
- The government regulations

2. Need for Technology Innovation (TI) in MSMEs

To attain the business environmental policy goals, enterprises will either have to bring about modifications in the way people do something, or changes in technology. Innovation is one of the main processes by which those changes come about. Davila et al. [17] organized reasons why enterprises undertake innovation:

- Improved quality
- Creation of new markets
- Extension of the product range
- Reduced labour costs
- Improved production processes

In order to enable MSMEs tide-over the problems of technological backwardness and enhance their access to new technologies, it is imperative to offer them a conducive environment, which in the present context of globalization, calls for approach with knowledge playing a predominant role. There is a need to understand and assess the real needs of the MSMEs and accordingly devise approaches that ensure their sustainable growth. The need today is also to leverage on modern technologies to harness human capabilities through the process of increased communication, cooperation and linkages, both within the enterprise as well as across enterprises and knowledge-producing organizations.

II. Literature Review

Modernization, technological and quality upgradation have assumed great significance in the present day’s context. With the inflow of latest technology reducing the cost of production and the increasing competition from within and outside, the small scale sector will have to attach more importance and pay attention to the areas of technology upgradation and modernization [18]. Extensive literature review has been carried out to access the importance of technology innovation in MSMEs and find out the major factors affecting technology innovation activities in MSMEs. Some of the important models are described as follows:

Subrahmanya (2004) has highlighted the impact of globalization and domestic reforms on small-scale industries sector. The study stated that small industry had suffered in terms of growth of units, employment, output and exports. Researcher highlighted that the policy changes had also thrown open new opportunities and markets for the small-scale industries sector. The author suggested that the focus must be turned to technology development and strengthening of financial infrastructure in order to make Indian small industry internationally competitive and contribute to national income and employment [19].

Saini et al. (2008) have discussed in their study that how issues of people management are addressed in Indian Micro, Small and Medium Enterprises (MSMEs). It also highlights the indigenous approaches to Human Resource Management (HRM) that have surfaced in the Indian MSME context. The research formulation has been built on the mapping of people-management practices in two MSME case studies, one of which is also a family-based organization. The analysis shows that indigenous realities in HRM in Indian MSMEs relate mainly to the provision of financial, emotional and social support to the workforce; Employee Involvement (EI) practices; recruitment; skill development; managing employee relations; and managing labor law framework [20].

Laranja (2009) draws the conclusion that until the 1980s, it was not that governments in Portugal began to develop a national Technology Infrastructure (TI). As we know there is no unified accepted definition of what constitutes a TI. According to him TI is comprising of different kinds of public, semi-public and private centres and institutes of research and technology. Following a latecomer supply side technology-push rationale and using European structural funds, successive governments in Portugal invested in building a comprehensive TI-system. Apart from that the development of such system overlooked the support needs of the enterprise sector. Hence, questions are now being raised as to
whether current policies and structures of support to technology transfer and innovation are relevant and operating effectively. Which in turn, is generating a need to consider new policies oriented to stimulate demand-pull and the use of the capabilities already existing? The outcomes of the efforts undertaken in Portugal to build an effective TI-system to support innovation and technology transfer and suggest new demand-oriented policies are assessed under this paper [18].

Sonia and Kansal (2009) present study described the institutions of entrepreneurship development, entrepreneurship and small scale industries, growth of small scale industries in India. The study is based on secondary data of the period of March 1992-March 2007. EDIs is the main institution which provided facilities in entrepreneurship education, performance and growth of existing entrepreneurs, micro enterprise and micro finance develop, performance improvement of entrepreneurship development organization. To develop competent successful entrepreneurs, is a three-tier process, i.e. creating achievement motivation, education and skill development and guide and support during pre and post training stages. Vocationalisation of entrepreneurial education and well-designed entrepreneurship awareness programs would help to create achievement motivation in entrepreneurship among the people in particular, educated youth [21].

Kamalian et al. (2011) have discussed the importance of innovation in organizations' competitiveness is an undeniable fact. Micro, Small and Medium Sized Enterprises (MSMEs) constitute 94% of Iranian firms. According to Iran statistic website the value added of 94% of Iranian firms is just about 10% of the whole value added in country. The study assumes the lag of innovation is the reason of uncompetitive nature of Iranian MSMEs. The study reports on the results of a study that examined barriers to firms' innovation among a sample of 86 managers of Small and Medium-Sized Enterprises (MSMEs) in Iran. Findings of the study show that the most significant barriers are associated with costs, whereas the least significant are associated with lag of information. The survey results show that Iranian MSMSs are not collaborating with universities and higher education institutions; they do not see university as a main source of information. Then it is not a surprising point that 29.0% unemployment rate is reported in 2009 however 50% of studied SMEs reported lack of skilled labour as a barrier to innovation [22].

Manan et al. (2011) have discussed that similarity between the stylized patterns of MSMEs financing in other parts of the world with that of Malaysian MSMEs is something that the study would attempt to investigate. Using descriptive analysis, findings of the study showed that the MSMEs in Malaysia are no less different from the rest of their counter parts. One interesting highlight of the study is the fact that a significant number of SMEs sought Islamic financing modes such as Murabahah, Bai’ bithaman Ajiland Ijarahs sources of external capital. This could give positive signal for the Islamic financial institutions to offer more of such facilities to the MSMEs [23].

Mungaya et al. (2012) conducted a survey about the fact that the tax plays an important role in the growth of Micro Small and Medium Enterprises (MSMEs). The role of MSMEs is critical in pushing the socio-economic development agenda in the low-income country like Tanzania. For this reason, alignment of the tax system to the environment specific MSME growth needs can be considered an important agenda for the policy makers. Keeping this issue as an important issue, the study aimed to explore the managers/executive officers’ perception of tax-system effectiveness in promoting MSMEs growth in the Country. Some selected respondent uses questionnaire and interview to administer the survey. Descriptive analysis method is used to analyze the data and findings were presented in terms of frequencies and percentage analysis. Findings indicate that majority of the respondents perceive the adverse impact of existing tax policies on the growth of MSMEs and suggest for reforming the tax policies in the Country. The findings would help the stakeholders in designing measures to align the tax-system to SMEs in a more effective manner [24].

Sankar et al. (2012) have examined the problems of MSMEs of Pathankot area, examine the scope of further financing MSMEs by Banks in Pathankot area and devise requisite strategies for financing of MSMEs by Banks in Pathankot area and thereby increase the SME loans portfolio which would help the banks and ultimately the country to achieve the projections as per Indian vision 2020 document by the Planning Commission according to which the Industry share in GDP which is 26% at present is projected at 34% and the service sector share which is at present 46%, is projected at 60% by the year 2020. On the analysis of the secondary data, which was obtained from Banks Performa Reports, Annual Returns and Annual Credit Plans, it was observed that huge scope exists for the banks in Pathankot centre for intensive financing of MSMEs which is observed from the data that at present CD Ratio at the centre is 58.71% (below the prescribed national average of minimum 60%) and the share of SMEs to total advances being 31.58%, which need to be increased to at least 50%. The primary study was conducted on the basis of random samples of five hundred micro, small and medium enterprises from manufacturing and service sectors at Pathankot. The tabulated data was analyzed by applying requisite statistical tools and inferences drawn. Based on the percentage wise responses the innovative and dynamic strategies have been suggested [25].

1. Entrepreneurship Development
   • Entrepreneurship education
   • Effective skills and growth of existing entrepreneurs
   • Vocational training of entrepreneurs and well-designed entrepreneurship awareness programs
   • Performance improvement of entrepreneurship

2. Financial Management
   • Shortage of own financial resources for innovation
   • Difficulty in access to finance via bank loans, Govt. subsidies etc.
   • Slow process for loan applications
   • Lack of Govt. policies like subsidies, relief in taxes etc.

3. Technological Co-operation (TC)
   • TC from larger enterprises
   • TC from R&D institutes
   • TC from academic institutions & universities
   • TC from government aided institutes
   • TC from suppliers

4. Employee Empowerment
   • Financial, emotional and social support to the workforce
   • Employee Involvement (EI) practices
   • Skill development of employees
   • Managing labor law framework

III. Conclusion
MSMEs not only play crucial role in providing large employment opportunities at comparatively lower capital cost than large
industries but also help in industrialization of rural & backward areas, thereby, reducing regional imbalances, assuring more equitable distribution of national income and wealth. The beginning of liberalization, privatization and globalization has brought onward agreement economic, social, environmental and technological pressure on the organizations. Markets have open become more open, competitive and the customers are more demanding. The present work presents three key broad issues for overall assessment of technology innovation issues in the manufacturing industry. These include Entrepreneurship Development, Financial Management, Technological Co-operation and Employee Empowerment for the improvement in manufacturing performance of MSMEs.

Industry lacks in proper training facilities to employees to enhance innovation skills. Management role has been observed to be effective in majority of organizations in the use of human resources. Manufacturing industry in the region is not interacting much with other research institutes or universities for technology innovation programs. Also, there are not much financial resources available for innovation activities within the MSMEs. Finally, it can be said that if technology innovation issues implemented successfully in organizations, it can lead manufacturing industries to attain new levels of achievements in technological innovations thereby improving their manufacturing performance.

References
Davinder Singh is working as an Assistant Professor at University College of Engineering, Punjabi University, Patiala, Punjab (India). He is working on his Ph.D. in the field of Technology Management in MSMEs.

Dr. J. S. Khamba is working as a Professor and Head (UCoE) at Punjabi University, Patiala. He has guided a number of students for their M.Tech. and Ph.D. work. Many students are pursuing their Ph.D. work under him. He has a large number of research projects, conferences and consultancies to his credit. He has published many Research papers in National/International Journals & conferences.

Dr. Tarun Nanda is working as an Assistant Professor at Thapar University, Patiala. He has guided a number of students for their M.Tech. work. Many students are pursuing their Ph.D. work under him. He has published many Research papers in National/International Journals and Conferences.