

# Impact of Technological Changes in Small-Scale Industries; A Conceptual Study on Indian Industry

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**Abstract:** The Indian small-scale sector is considered as the mainstay for the country's economic growth and has attentively working for the fortification of the Indian economy as 45% of the country's exports have been deriving from the small-scale units only. The concerned sector is equipped with 36.1 million units around the country and spread very much evenly throughout the country, the small-scale industries which are in the manufacturing sector contributed for 6.11 % and the services sector contributed for 24.63% of the nation's GDP and adding to this the sector has been providing 120 million job opportunities. The Indian small-scale industrial sector started adopting the technological changes to attain the effective production. This research paper aimed to analyze the various factors of technological changes and their impact on promotion of small-scale industries.

**Keywords:** *Small-scale industry, Technological changes, Effective Production, Promotion of small-scale industry*

## I. INTRODUCTION

The implementation and usage of technology attains a competitive advantage in the business firms received a great attention in the recent years. The studies of Niederman, Brancheau and Wetherbe (1991) revealed that the topic of change of technology and the problems related to the technological changes in the small-scale industry. The increasing number of small-scale firms which are intended to adopt the new technology and upgrade themselves is another reason which provokes to think of the small-scale industry and its adoptability levels (Cragg and King, 1993). The technological changes can bring the competitive advantage and forms the better relations with all its stake holders of business (King et al., 1992). Technically compatible firms only can attain the competitive advantage and survive in the excessive competition (Sprague and McNurlin, 1993). Many of the firms started adopting the technological changes in their firms, this phenomenon is quite good in the large and medium scale sector but in the small-scale sector the momentum is low (Niederman et al., 1991). Further the adoption of technology and their impact over the different dimensions of the firms have been empirically proved by many researchers (Moore and Benbasat, 1991).

## II. OVERVIEW OF TECHNOLOGY DIFFUSION IN SMALL-SCALE INDUSTRY

In the recent years, many policies and procedures have been framed for the sake of technology diffusion in many developed and emerging economy countries too. The actual diffusion of technology has been related with various aspects in the small-scale sector such as, industrial competitiveness, effective productivity, growth of economy, business development, enhanced flexibility in the business process, quality enhancement and to attain the all-round development. In this connection, the small-scale sector units are focusing on

adoption of technology to their units and taking such measures as they are not relying only on making the policies but strictly adhere to the implementation to attain the effective results. Enough care has been provided by the entrepreneurs to procure the infrastructure facilities to adopt technology successfully.

The following subsections explain the various aspects such as, the nature and meaning of technology diffusion and the broad categories of technology diffusion measures. Thereafter, the policies to be framed for the effective implementation in small-scale industries are presented. The review of technology diffusion practices of small-scale industries in the different countries is presented in the scholarly manner.

The subject of technology diffusion explains about the propagation of technical information and explains the adoptability process of emerging technologies and innovative technology by its users (Norwell, 2012). The technology adoption will be includes, in two different dimensions as it can be reflected in hard technology such as the machines or the accessories which can be used for the tools and machines. The soft technologies which are meant for the operating process or the procedures of the technology which is normally invisible. Comparing with the hard ware technology software requires some expertise. The technology adoption practices can be seen in both the products and services. The classic models of technological progression propose a forthright linear path from basic research and development to technology commercialization and adoption but in reality, the technology diffusion is more complex and iterative one (C.Eduist et al., (2011). Technology may be diffuse in various ways with significant variations based on the technology adopted, time limit and other aspects. Moreover, the effective use of diffused technologies by firms often needs organizational, workforce, and follow-on technical changes.

Technology diffusion will be compared with technological innovation, which highlights on the new product development which often seeks to change advanced technology out of laboratories into commercial use (P.Shapira et al., (2012). In many cases, diffused technologies are neither new nor necessarily advanced though they are quite new to the customers, and they may be learned from different resources which includes the vendors, customers, consumers, and all other stake holders. Technology also disperses through the internal "catch-up" efforts of firms, the transmission and movement of skilled labor, the actions of professional societies and the trade and scientific press, varied forms of informal knowledge trading (EvonHippel, 2007).

## III. NEED FOR THE STUDY

**"Small businesses form the vast"**, in majority of the nation's the small business firm's impact is very impressive (Thong et al., 1995) and the phenomenon is same in India too as its 45% of the exports are manufacturing in the small-scale units. This

strongly indicates the importance and significance of the small-scale sector for the nation's growth and development. This statement can be reinforced with the observations as 95% of the enterprises in European Union is small-scale sector (Dyson, 1990) and in US it is 98% (Pickle et al, 1990). The governments in the various countries acknowledged the efforts of small-scale industries and have been supporting for their development (Gibb et al, 1990).

The technology diffusion can aid the small-scale sector to enhance their competence and efficacy to attain the competitive advantage over their competitors (Benjamin et al., 1984; Earl et al., 1989; Ives.B et al., 1984 and Porter et al., 1990). The technological developments can yield many benefits such as reducing cost in terms of manufacturing, maintenance, production etc., user-friendly operations and comfort.

### **Objectives of the Study**

The important objective of this research paper is to provide the knowledge over the perceptions of small-scale industry entrepreneurs on technology adoption practices in the Indian context. The numerous objectives of the study are as follows:

1. To study the growth and development of small-scale industries in different context including western and Indian.
2. To explore the impact of technology on small-scale industry dimensions such as, organisational performance, growth and development, Productivity and New Product Development over the small-scale industry sustainability in the Indian small-scale industry sector.

### **IV. REVIEW OF LITERATURE**

Many investigations have been made on small scale businesses, when all is said in done. Both the Central and State Governments have taken up various research extends on small scale businesses through individuals from the scholarly and non-scholastic sides since they give work to a great many specialists other than acquiring upgraded national wage terms of household wage and outside trade (Niederman et al., 1991). There are various works managing the different issues looked by small scale modern units. This field of study is voluminous and different examinations are accessible in regard to the budgetary, generation, promoting, and staff administration issues of small scale modern units (Norwell et al., 2014).

Each part of small scale units and their issues have been considered and some solid outcomes have been acquired yet at the same time there is extension to ponder the issues of small scale mechanical units. This part endeavors to audit the writing identified with small scale units. In for all intents and purposes each nation, created or less built up, a significant part has been allocated to the small ventures in quickening the pace of monetary advancement and supporting it. Indeed, even in our own particular nation, small units have been taken up are as yet anticipated that would take up a significant part during the time spent monetary and modern advance (Subhash, 1990).

Regularly two variables have been fundamentally in charge of the concurrence of small scale firms alongside the bigger units;

- The nature and size of the market for products.
- The specialized elements and asset accessibility, which support smaller size on events.

For example, small units have leeway in using restricted amounts of confined crude materials for changing over them

into semi-completed items previously passing them on to the vast units for a more elevated amount of fabricate. Also, there are circumstances in which it is unrealistic to transport items over long separations either because of financial or innovative reasons. The business sectors are then confined and are, as a rule, very small. The small units will then have a tendency to be the main financially feasible type of generation.

There are likewise different elements which require the development of small firms.

- The need to use the not profoundly gifted work constrain, combined with the non-accessibility of satisfactory abnormal state business visionaries, recommends that small endeavors will be of essential significance.
- The scarcity of investment restrains development of generation and the interest for administrative capacities is less in the effective association of present day producing small undertakings however their lacunae.

The administrative capacity co-appointment in small units is contrarily relative to the requirement for it. The accompanying essential factors any are in charge of the absence of proficient administration in small scale units.

- The smallness of size restrains division of work to some degree and makes it hard to draw in and pay proficient directors.
- The proprietor administrator isn't a specialist in the administration forms.

The role of small scale industry in the monetary action of cutting edge industrialized nations like India, Japan, Germany, Great Britain and the United States of America is noteworthy. Numerous nations, both industrialized and developing exteriorized that the small business sector is a helpful vehicle for development, in the later for the making of new openings on a wide scale in the most limited conceivable time. Small and medium undertakings represent roughly 80 percent of the private division engineering specialists and henceforth possess a vital position in the engineering structure. The work making limit of the small and medium ventures in India has been observed to be bigger.

### **CONCLUSIONS OF THE STUDY**

This paper determined that the various factors of change in technology on the various aspects such as, organisational performance, growth and development of the small scale industries, productivity of the firm and new product development process due to the technological changes in the small scale industries.

The research findings of this thesis contributes to understand the effect of technological changes on sustainability of the small-scale industries. The derived results from the thesis will be considered as the value addition and the added knowledge to the very scant academic literature so far in the technological changes impact over the sustainability of small-scale industries in India.

### **References**

- [1] CII Report, 2016.
- [2] Niederman, F., Brancheau, J. C., and Wetherbe, J.C. "Information Systems Management Issues for the 1990s," (1991).

- [3] Cragg, Paul and King, Malcolm. 1993. "Small-Firm Computing: Motivators and Inhibitors," *MIS Quarterly*, (17: 1).
- [4] King, Malcolm. 1992. "Small-Firm Computing: Motivators and Inhibitors," *MIS Quarterly*, (16: 1).
- [5] R. H. Sprague, Jr. Univ. of Hawaii, Honolulu (1993) , Information systems management in practice: 2nd edition
- [6] Gary C. Moore and Izak Benbasat. (1991). Development of an Instrument to measure the Perceptions of Adopting an Information Technology Innovation. Information Systems Research.
- [7] Norwell (2012), MA: Kluwer Academic Publishers, 1992.
- [8] E. Maleki, Technology and Economic Development, New York: John Wiley, 2011.
- [9] P. Shapira, J. Roessner, and R. Barke, Federal-State Collaboration in Industrial Modernization, Atlanta, GA: School of Public Policy, Georgia Institute of Technology, Atlanta, 2012.
- [10] Evon Hippel, Cooperation between rivals: informal know-how trading, *Research Policy*, 2007, 16: 291-302.
- [11] B. Guile and H. Brooks (editors), Technology and Global Industry: Companies and Nations in the World Economy, Washington, DC: National Academy Press, 2007).
- [12] U.S. Congress, Office of Technology Assessment, Making Things Better: Competing in Manufacturing, Washington, DC: USGPO, 2016.
- [13] G. Bräunling, Economic development: the role of new networked infrastructures for innovation, in: D. O'Doherty, Globalisation, Networking and Small Firm Innovation, London: Graham and Trotman, 2005: 284-290.
- [14] Technological Infrastructure Policy: An International Perspective, Norwell, MA: Kluwer Academic Press, 2006.
- [15] R. Rothwell and W. Zegveld, Industrial Innovation and Public Policy, Westport, CT: Greenwood Press, 2011.
- [16] D. Luria and E. Wiarda, Performance benchmarking and measuring program impacts on customers: Lessons from the Midwest Manufacturing Technology Center, *Research Policy*, 2013, 25, 233-246.
- [17] A Compendium of State and Federal Cooperative Technology Programs, Columbus, OH: Battelle, 2015.
- [18] U. Kuntze and K. Hornschild, Evaluation and promotion of R&D activities in small and medium-sized enterprises, in G. Becher and S. Kuhlmann (editors) Evaluation of Technology Policy Programs in Germany, Dordrecht, The Netherlands, Kluwer, 2015, 33-54.
- [19] W. Segenberger, G. Lovemen, and M. Piore, The Re-Emergence of Small Enterprises, Geneva: International Institute for Labour Studies, 2006.
- [20] R. Hassink, Technology transfer agencies and regional economic development, *European Planning Studies*, 2016, 4,2: 171.
- [21] R. Dore, Taking Japan Seriously, Stanford, CA: Stanford University Press, 1987; and M. Best, The New Competition: Institutions of Industrial Restructuring, Cambridge, UK: Polity Press, 2010.
- [22] FraunhoferGessellschaft, Profile of the FraunhoferGessellschaft: Its Purposes, Capabilities and Prospects. Munich: Fraunhofer Society, 2015.
- [23] Steinbeis Foundation, We Innovate Faster: Report 1995, Stuttgart: Government Commission for Technology Transfer, 2015.
- [24] P. Shapira, (2014) Modernizing small manufacturers in the United States and Japan: public technological infrastructures and strategies, in M. Teubal, et. al., op.cit., 285-334.
- [25] D.W. Edgington, New strategies for technology development and information systems in Japanese cities and regions, in P. Shapira. I. Masser, and D. Edgington (editors), Planning for Cities and Regions in Japan, Liverpool, U.K.: Liverpool University Press, 2014.
- [26] L. Branscombe (editor), Empowering Technology: Implementing a U.S. Strategy, Cambridge, Mass.: M.I.T Press, 2013.
- [27] M. Kelley and T. Watkins, The myth of the specialized military contractor, *Technology Review*, April 2015, pp. 52-58.
- [28] Ruddu Datt & KPM. Sundram, "Indian Economy" S.Chand & Co., Ltd., P.No:581, 1999.
- [29] Annual Report, 2002-2003, Ministry of small scale industries in India, P.No.8.
- [30] Dr.Satish B.Mathur, "Sickness in SSS – Causes and Cures", Concept Publishing Co., New Delhi, P.No 12, 1999.
- [31] P.N.Dhar & H.F.Lydall, the role of small enterprises in Indian Economic Development, New Delhi, P.No.12, 1962.
- [32] Ruddu Datt & KPM. Sundram, "Indian Economy" S.Chand & Co., Ltd., 1999.
- [33] Indian Express, Dubious distinction for TN: 25% Of SSI's are sick despite central aid, August 14, 1993.
- [34] Vasant Desai, "SSI and entrepreneurship", Himalaya Publishing House, Mumbai, P.No – 58 - 2003.
- [35] SSI and Entrepreneurial development, by C.S.V. Murthy, Himalaya Publishing House, Mumbai, P.No. 114.
- [36] K.C.Reddy, "SSI"- Ashish Publishing House, New Delhi, P.No.57-72.
- [37] Government of India, Report of the Industrial Commission, P.No.295, 1998.
- [38] Dr.R.JayaPrakash Reddy, Problems and Development of SSI in India, Ashish Publishing house, New Delhi – 1991, P.No.4, 5, 6.