

Challenges before Indian SME’S for the Implementation of Lean Six Sigma for Scrap Reduction: A Review

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ABSTRACT: Present research paper puts light on the current challenges faced by Indian SME’s for the implementation of Lean Six Sigma for the purpose of scrap reduction. Global scenario of SMEs and various schemes offered by the governments for their upgradation is also discussed in this paper. From the detailed literature survey it has been noticed that a number of challenges have been faced by the SME’s while the implementation of Lean Six Sigma.

Keywords – LEAN, Six Sigma, Small and Medium Enterprises (SME’s)

I. INTRODUCTION

Small and Medium Enterprises (SMEs) are playing an important role in the economic growth of India. As per available data SMEs are contributing 18% in the GDP growth of India (FY 2014-2015). SMEs are also a source of employments for the 50% of Indian population. Today SMEs are flourished in well-organized clusters based manner (Mandar et al., 2014). SMEs are those industrial organizations whose number of employees and the annual turnover falls under a certain limit. According to newly enacted MSME Development Act 2006, which is effective from October 2, 2006; the enterprises are classified according to the following criteria (Rodriguez et.al. 2007). The main barrier in the growth of SMEs is the optimum utilization of available resources. Even National Manufacturing Competiveness Council (NMCC) has proposed the various schemes for developing the global competitiveness of Indian SMEs but still they are facing huge losses due to wastage of available resources.

TABLE I. Types of Enterprises in India (Source: Rodriguez et.al. 2007)

Type of Enterprise	Investment in plant and Machinery engaged in production of goods	Investment in equipment engaged in providing or rendering of services
Micro enterprise	Does not exceed 25 Lakh rupees	Does not exceed 10 Lakh rupees
Small enterprise	More than 25 Lakh rupees, but does not exceed 5 Crore rupees	More than 10 Lakh rupees, but does not exceed 2 Crore rupees
Medium enterprise	More than 5 Crore rupees but does not exceed 10 Crore rupees	More than 2 Crore rupees but does not exceed 5 Crore rupees

II. SMES: GLOBAL SCENARIO

Small and Medium Enterprises are playing a vital role in the manufacturing sector of various developing and developed countries of world. As per Lozzi (2008), SMEs of any country are having a strategic importance in economic growth because of their considerable contribution in terms of production, sales and development. Presently

the status of SMEs of various major countries of the world is mentioned in table no 2 below.

TABLE II Global Scenario of SMEs

S.No	Country	Scenario of SMEs
1	United States	Units are directly benefitted by the government policies. There is direct cash flow by government to enhance the quality of the SMEs. As per Small Business Act the units having anticipated value of greater than US\$2,500 but less than US\$100,000 are considered for small business concerns only.
2	Latin America	Recently Latin America also started focusing on SMEs as they are providing employment to a larger part of population
3	Taiwan and Hong Kong	In 2005, Hong Kong was having almost 270, 000, SMEs giving employment to approx. 50% of population i.e. employment opportunities to 1.2 million people.
4	China	China is having 10 millions of Urban and rural SMEs and they contributes 60% of Chinas industrial output
5	Indian	As per the socio economic model of India role of SMEs was meant for to generate foreign exchange, providing jobs and to contribute in earning the foreign exchange but due to improper implementation of various govt. policies they failed to achieve the desired targets.

III. GOVERNMENT SCHEMES TO UPGRADE SMES

Indian government is working towards the up gradation of SMEs, therefore Ministry of Micro Small and Medium Enterprises had launched a number of schemes in order to enhance the condition of Indian SMEs. Some of the important schemes are listed in the table no 3 below.

TABLE III. Government Policies to assist SMEs

S.No	Scheme	Brief
1	Micro & Small Enterprises Cluster Development Program (MSE-CDP)	This scheme has been adopted for the development of clusters in order to enhance the competitiveness of SMEs. Main objective of this scheme is to support the sustainability and growth of SMEs in terms of quality, skills and technology.
2	National Manufacturing Competitiveness Program (NMCP)	Various plans have been launched under NMCP such as design of mini tool rooms, opening of new design clinics and marketing support for SMEs
3	Enabling Manufacturing Sector be Competitive through Quality Management Standards and Quality Technology Tools	Main objective of this scheme is to enable the SMEs to adopt the latest Quality Management standards and to use latest quality tools to improve the quality.
4	Lean Manufacturing Competitiveness Scheme for MSMEs	The main objective of this scheme is the application of various Lean Manufacturing tools in order to improve the manufacturing competitiveness

5	Design Clinic Scheme for design expertise to MSMEs manufacturing sector	The aim of the scheme is to increase competitiveness of MSMEs through design and hence spread awareness on importance of design and its learning.
6	Marketing Assistance & Technology Up-gradation Scheme	This scheme is basically an initiative of GOI in order to adopt the modern marketing techniques by SMEs
7	Technology and Quality Up-gradation Support to MSMEs	This scheme enhances the use of energy based technologies in manufacturing sectors in order to reduce the production cost and adopt clean development mechanism.
8	Skill Up gradation & Quality improvement and Yojana	The objective of the scheme is to train personnel for the cadres of supervisors/instructors/artisans to meet the requirement of skilled manpower for the development of SMEs

IV. STATUS QUO OF INDIAN SMES

Numbers of SMEs in India are continuously increasing every year. As per data available from Indian equity brand foundation, the numbers of SMEs are increased from 5008 to 7735 from FY07 to FY 11. The rate of increase of the same on yearly basis is shown as under. And as per available data from Ministry of micro small and medium enterprise 55% of SMEs are situated in urban part where as remaining 45% is established in the rural part of India. Contribution of these SMEs is 16% in repair and maintenance, 17% in service sector and 67 % in the manufacturing sector. Even though the Indian SMEs are facing various challenges such as unavailability of modern technology, lack of infrastructural facilities, unavailability of skilled workers etc.

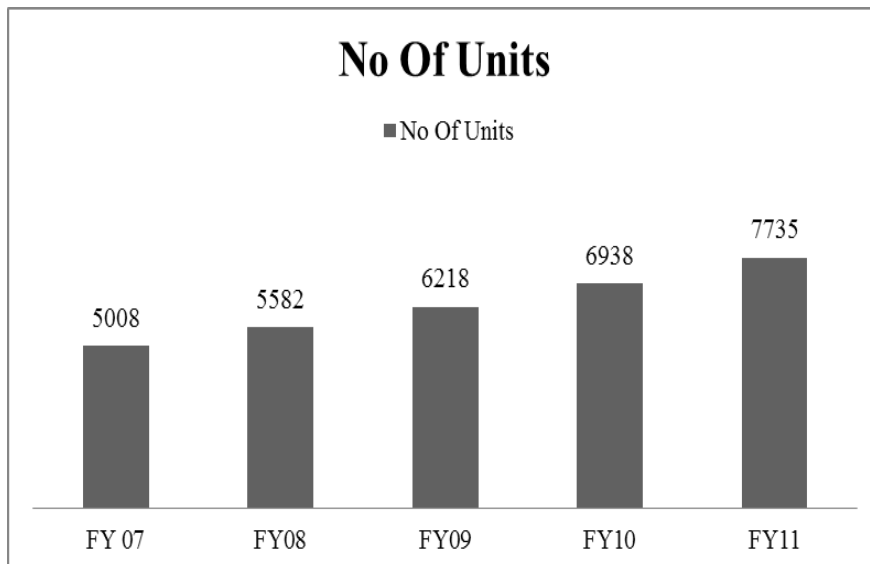


Fig. 1: Increase in number of SMEs
 (Source: Ministry of micro small and medium enterprise)

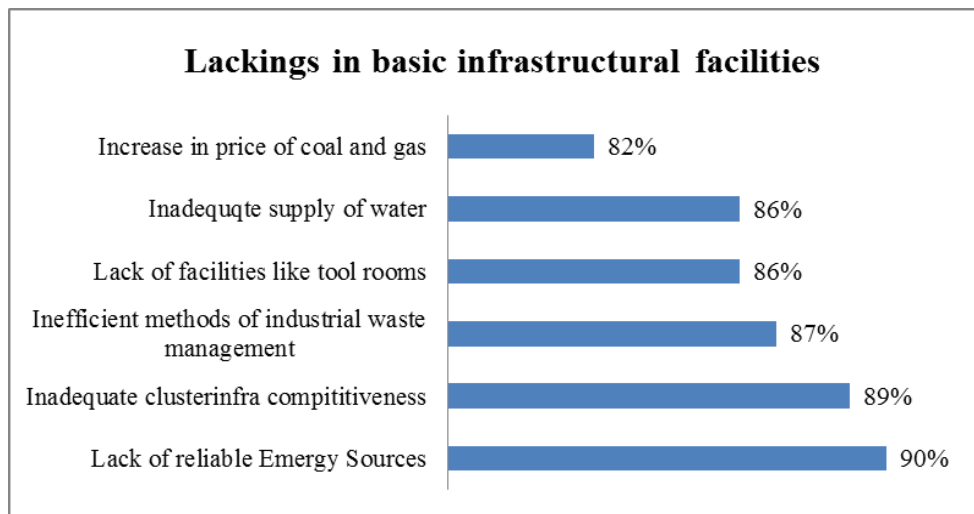


Fig. 2: lacking in basic infrastructural facilities
 (Source: Ministry of micro small and medium enterprise)

Figure 3 highlights some of the key issues that enterprises face because of inflexible labor laws. The majority of enterprises (84%) feel that retaining talent is the biggest challenge due to lack of ability to pay well and inadequate employer branding. The challenge that fared lowest amongst respondents was unavailability of skilled workers at affordable costs, 77% enterprises felt this was a challenge. Even low productivity of labor and lacking of minimum wages policy are also among the major reasons for the lacking of Indian SMEs on manufacturing as well as economic fronts.

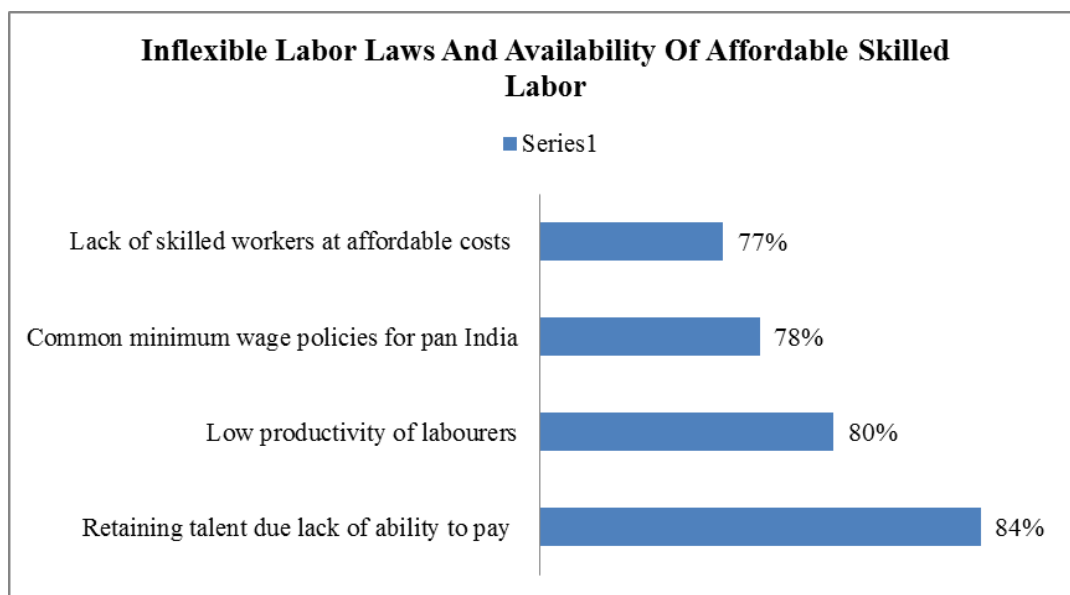


Fig. 3: Inflexible Labor Laws and Availability of Affordable Skilled Labor
 (Source: Ministry of micro small and medium enterprise)

V. CHALLENGES BEFORE LEAN SIX SIGMA IMPLEMENTATION

As far as LSS is highly profitable technique in America, but India is facing a number of challenges for its implementation such as : Un skilled workers, Less awareness about LSS: Afraid of getting company culture effected, Supply Chain Issues, Employee Development and other Technological Challenges. Approximately 30 per cent of Indian SMEs have applied LSS in its business and the remaining 70 per cent are not yet engaged with LSS initiative for a number of reasons (Antony and Banuelas, 2002). Satisfaction with other quality and productivity improvement initiatives turned out to be the strongest reason for not embarking on LSS program,

followed by lack of awareness and unsuitability of the initiative to their type of business (refer figure 4 for details).

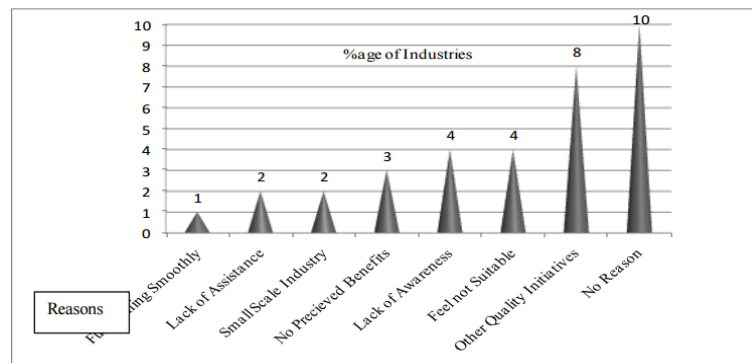


Fig. 4: Reasons for not adopting LSS
 (Source: Antony and Desai, 2009)

VI. LITERATURE REVIEW

Thorough literature survey has been carried out to capture the voice of concerned people and their relevant works as far as implementation of Lean six sigma in various (Large, Medium and Micro) industrial organizations are concerned. Literature based upon waste management has been reviewed and it reveals that waste is having a great significance on the economic losses bared by an industrial organization. Uma (2013) discussed that waste reduction in Industrialization is a very effective means for solving the problems related to economic and social progress as far as developing countries of the world are concerned. Myrdal (2013) has rightly described the relationship between industrialization and economic development when he observes that “the manufacturing industry represents, in a sense, a higher stage of production in advanced countries”. Vinesh(2012) describes that in modern environmental legislation is becoming much more internationally coherent and less prescriptive, and focused on prevention of pollution through control of hazardous materials and processes as well as on protection of eco-systems. Garish(2012) purposed Value Stream mapping technique involves flowcharting the steps, activities, material flows, communications, and other process elements that are involved with a process or transformation showing significant effect of wastage on industrial economies. Tamizharasi (2014) discussed about various waste management techniques used in Indian MSME suggested benefits of implementing lean concept and focuses on Value Stream Mapping (VSM) and Single Minute Exchange of Dies (SMED) in Carriage Building Press shop. Kumar (2014) identified various Lean manufacturing systems acknowledged by Indian industry as a capable system in enhancing organizational performance by focusing on elimination of waste from the manufacturing system and thus improving effectiveness of the organization. Kumar (2014) examined that efforts have been made to identify the barriers for lean implementation and then to develop the relationships among these identified barriers. Literature of various people who worked upon Lean Six Sigma has been reviewed and brief summery has been illustrated below. Prieto-avalos (2014) studied that Lean manufacturing provides an approach to identify and eliminate waste and all non-value added activities through continuous improvements. Thanki (2014) concluded a report of pilot study on LSS awareness and implementation using the survey data collected from about 32 industries situated in western and eastern region of India. A survey instrument containing 45 statements was designed to assess respondents’ attitude and awareness toward lean practices and to explore the level of lean implementation in the organization. Naveen (2013) indicated that The requirement of Lean six sigma manufacturing has increased due to waste and subsequent increase in cost of the manufacturing goods.

VII. RESEARCH GAPS

After thorough literature review it has been found that reduction of scraps can play a key role in in order to maximize the profits of Indian SMEs. In past number of waste reduction techniques has been utilized by various researches such as TQM, Quality control, JIT, KAIZEN, 5S, Lean Manufacturing, Six Sigma etc. But it

has been observed that these techniques are lesser effective to give the desired results due to various reasons. As generally product oriented approaches are found, instead of process oriented scrap management techniques. Lean Six sigma is a scrap reduction technique which is quite widely utilized in American states at present, and good results are reaped after its proper implementation. But from literature survey it has been observed that LSS is very rarely used technique in Indian industrial environment. Therefore there is a huge scope of implementing LSS technique in Indian SMEs and to notice the subsequent changes. From reviewed literature it has been observed that there is no standard procedure for the implementation of Japanese techniques in the industries. Even there is lack of professional approach to fight for waste management. Proper training to Green belt, Yellow Belt & Black Belt is required as well as further training of the work force can be done in order to implement the LSS.

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