

MODELLING of ENABLERS of INNOVATION for SMEs: AN ISM APPROACH

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Abstract - The growth of the country depends on the presence of the small and medium enterprise and the policy of the country to be innovative. In this research paper some important factors are identified that are responsible for the growth of SMEs and country also. An ISM approach is used to establish interrelationship between these enablers to innovation for SMEs based on literature reviews, expert's views and industrial managers of relevant fields and an effort is made to understand the levels of these factors. These factors are also categorized depending on their driving power and dependence power. In this research study change management and risk taking capacity are top rated factors. In the present work, eight variables are identified for modeling factors of innovation to SMEs. By using an ISM approach a relationship model among factors of innovation to SMEs has been developed. But this model is not statistically validated.

Key Words: SMEs, Enablers, Innovation, Entrepreneur, ISM, Modelling

1. INTRODUCTION

Innovation is important for economic growth. An important factor of the market economy is the role of innovation, rather than price, as a driving force in competition and rivalry between firms in the marketplace (Austí Segarra-Blasco & Jose Garcia-Quevedo & Mercedes Teruel-Carrizosa; 2008). SMEs in the manufacturing sector are also confronted with increased competition from cheaper manufactured products from such countries as China and India (Bessant and Tidd, 2007).

Nakane and Hall (2007) presented that some of the manufacturers were undergoing a 'paradigm shift' in the way they look at manufacturing operations these days. As of today, Indian manufacturing industry has not fared well against the aggressive competitive strategies adopted by their international competitors.

A.Haleem et al. (2012) has been identified some crucial CSFs that are responsible for the growth of manufacturing sectors. In this paper, the interactions of enablers of innovation for SMEs are analysed and modelling approach is used to rank of enablers. Interpretive structural modelling (ISM) is applied to understand the contextual relationship among the enablers and find out the crucial elements for SMEs.

2. Literature Review

Here literature review is categorized into two different sections as given below:

- Innovation of SMEs.
- Enablers of Innovation

2.1. Innovation of SMEs.

A CSF is a factor that is important for an organization to achieve its goal. According to Boynton and Zmud (1984), enablers are those factors that are responsible for the success of an organization critical success factors include issues vital to an organization's current operating activities and its future success.

Innovation is not seen as something periodical that happens by accident, or something that results from the action of an individual agent. Innovation is seen as the result of an interactive and nonlinear process between the firm and the environment (Lundvall, 1992).

Saxena and Sahay (2000) conducted a survey to determine the world-class status of Indian manufacturing companies. Chan et al. (2005) discussed maintenance training system, management support and resource management as some enablers for total productive maintenance implementation in electronic manufacturing company.

Achanga et al. (2006) found out the enablers for successful lean implementation with SMEs. Mendoza et al. (2007) suggested a model based on critical success factors for a customer relation management strategy. These factors cover the three key aspects of every customer relation management strategy: human factors, processes and technology. Many researchers have dealt with the nature, sources and determinant elements of innovation to understand why some firms innovate more than others. However, few studies have focused on the factors that restrain innovation and on the ways to overcome it to promote business excellence. The identification and the measurement of enablers to innovation are quite important for two reasons. First, the enablers to innovation should be identified in order to provide the important changes both at the external and internal level to overcome it in an effective way. Second, for promoting business excellence, the measurement of the effects of each restraining element is fundamental in order to find out the relative importance of each factor (i.e., economic, internal and others) and in this way, to promote an entrepreneurial culture oriented in innovative practices. (M.J. Silva, J. Leitao and M. Raposo; 2008)

Eid (2009) has suggested comprehensive set of factors influencing the successful implementation of world class manufacturing in Egyptian manufacturing firms. Amber and

Dale (2010) presented redundancy program and unskilled labour in lean production as two CSFs to the application of lean production system. Brun (2011) has suggested the enablers of six sigma implementation in Italian companies and found management involvement and commitment, cultural change, communication and culture, education and training as enablers.

2.2. Enablers of Innovation

Enablers approach to innovation is very common for small and medium size enterprises. A lot of authors have adopted this approach to innovation for small and medium size. The enablers were found out through literature survey and opinion of experts from industry. We have identified eight enablers that are change management (Ravinder et al., 2015); Risk taking capacity (Rao and Deshmukh, 1994); funding (Rameshwar Dubey and Sadia Samar Ali, 2014); Availability of trained personnel (Tornatzky and Fleischer, 1990); Customer’s responsiveness (Saleh and Wang, 1993); market (Lieberman & Montgomery, 1998); Government’s policy (Narain et al. 2004); Legal structure (Wilson, 2007).

3. Research methodology

The aim of this paper is to examine the relationships among various enablers of innovation for SMEs and to rank them with reference to various performance measures. Here, the ISM is used to examine the contextual relationships among enablers of innovation for SMEs.

3.1 INTERPRETIVE STRUCTURAL MODELLING (ISM)

ISM methodology was suggested by Warfield (1974) and Sage (1977) is an adaptation of paired-comparison approach. ISM methodology is an interactive learning process, whereby a set of different and directly related elements are structured into a comprehensive systematic model. This model shows the structure of a complex problem, a system or a field of study, in a carefully designed pattern involving graphics as well as words (Lal and Haleem 2009).

3.2 INTERPRETIVE STRUCTURAL MODELLING (ISM) for ENABLERS of INNOVATION for SMEs

In this section we described the development of ISM model

Table -1: Structural self interaction matrix (SSIM) for enablers

	FACTORS	8	7	6	5	4	3	2
1	Change management	A	A	O	O	A	V	X
2	Risk taking capacity	A	A	O	A	A	A	
3	funding	A	A	O	V	A		
4	Availability of trained personnel	A	A	O	V			
5	Customer’s responsiveness	O	O	X				
6	market	A	A					
7	Government’s policy	V						
8	Legal structure							

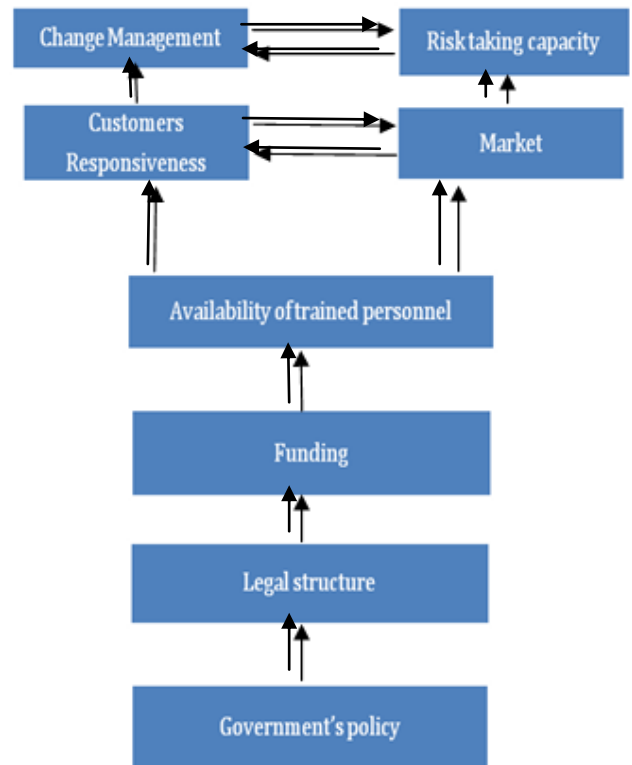


Figure1. ISM-Based Structural Model for enablers of innovation

4. Result and Discussion

ISM can only act as a tool for imposing order and directions on the complexity of relationships among the variables. ISM technique has been found appropriate to model the critical factors (eight in number). In our result Change management and Risk taking capacity are the top rated enablers to innovation where as resistance to change and risk aversion culture were the top rated barriers according to Lawrence H. Orcutt and Mohamed Y. AlKadri; 2009).

5. CONCLUSIONS

In this paper, an attempt has been made to identify the major enablers of innovation for SMEs that can be useful for successful in implementation in growth and profit of SMEs in India. In the present work, eight variables are identified for modeling factors of innovation to SMEs. By using an ISM approach a relationship model among factors of innovation to SMEs has been developed. But this model is not statistically validated.

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