

ORGANIZATIONAL STRUCTURE INFLUENCE ON THE TECHNOLOGICAL ADAPTATION BY THE SMES IN SRI LANKA: WITH SPECIAL REFERENCE TO AUTOMOBILE INDUSTRY

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Abstract

The objective of this study is to assess the level of influence by the organizational structure in the adapting the new technologies in the Small and Medium Enterprises (SMEs) in the Sri Lankan context. The objective of the paper provides the better understanding to the SMEs to organize their organizational structure to achieve the desired goals and objectives by utilizing the hard technologies in the organizational context. This study consists with the comprehensive literature review and also with the primary data gathering based on the questioner. This paper is a theoretical construction that synthesizes previous studies, and centers on the internal organizational structure which influence adoption of hard technologies. This model can provide managers with practical solutions through granting in-depth understanding of whole internal environment, and awarding empirical insight into overcoming barriers to the adoption and implementation of hard technologies and other process innovations in automobile sector SMEs in Sri Lanka.

Keywords: Advanced Manufacturing Technologies; Small- And Medium-Sized Enterprises; Technological Adaptation.

1. INTRODUCTION

Small and Medium Enterprises (SMEs) play an important role in any economy through generation of employments, contributing to the growth of Gross Domestic Production (GDP), embarking on innovations and stimulating of other economic activities (Gamage, 2000). Therefore, for the developing countries, it is important to accelerate the growth of SMEs in order to gain sustainable development. The numbers of SMEs in Sri Lanka tend to increase continuously.

Complexity, dynamism, and uncertainty have become dominant characteristics of recent competition patterns which resulted in a demand-diversified market with more multifaceted products (Singh et al., 2010). In the global business environment, technology is one of the salient elements for remaining competitive (Jabar et al., 2010). Manufacturing inevitably has been influenced by re-definition of competitiveness and evolved to keep abreast of the latest market demands and arisen technologies. SMEs should reassess their manufacturing processes and strategies and indispensably they should define an environment which is the result of integration of latest manufacturing strategies and business processes. Advanced Manufacturing Technology (AMT) has been considered as a viable solution to improve efficiency and lower costs of manufacturing firms and it has taken a determining role in this process.

2. IMPORTANCE OF INDEMNIFY THE INTERNAL BARRIERS TO ADAPTING THE TECHNOLOGY

As an emerging industry in Sri Lanka Auto mobile industry is having a huge potential in the market in that the SMEs having the more opportunities in growing their business and the expand the current business operations. In that the adaptation of new advance manufacturing technologies will attract the more loyal customers as well as the more profitability to the organization in the day to day operations. And on the other hand understand the factors affecting towards the advance manufacturing technological adaptation will help them to overcome these barriers in the future to create the definite competitive advantage over the competitors.

3. LITREATURE REVIEW

Complexity, dynamism, and uncertainty have become dominant characteristics of recent competition patterns which resulted in a demand-diversified market with more multifaceted products (Singh et al., 2010). In the global business environment, technology is one of the salient elements for remaining competitive (Jabar et al., 2010). Manufacturing inevitably has been influenced by re-definition of competitiveness and evolved to keep abreast of the latest market demands and arisen technologies. SMEs should reassess their manufacturing processes and strategies and indispensably they should define an environment which is the result of integration of latest manufacturing strategies and business processes. Advanced Manufacturing Technology (AMT) has been considered as a viable solution to improve efficiency and lower costs of manufacturing firms and it has taken a determining role in this process.

Even with clarifying and identifying benefits and contribution of technologies for SMEs, there are issues regarding the effective exploitation of these technologies. Problems regarding planning, installation, and implementation stages of AMTs can prevent the SMEs from enjoying the benefits of technologies (Ungan, 2007). The outcome of companies in terms of performance using AMT does not only depend on whether the employed technology is state of the art or not. In fact maximizing the performance of employed AMTs does not depend on technology itself, how well it is implemented, is a crucial factor (Waldeck and Leffakis, 2007).

3.1. Small and Medium Enterprises

There is no universal definition for SMEs since the definition depends on who is defining it and where it is being defined. The World Bank (WB) in a study of SMIs (1997) categorized small as those that had 1-49 workers as small, 50 –99 as medium and above 100 as large. As is evident from the foregoing classifications, there has been no effort in recent times to provide a clear definition for identification of the SMEs for development and research purposes, thus making all analytical studies of SMEs a difficult task. Furthermore it has also been observed that there is no definition of micro enterprises, which is generally categorized under the umbrella of “Informal Sector” However from the point of view of policy formulation and evaluation of the contribution of the sector, it is important that attention is paid to the definition of the sector while ensuring flexibility.

The Department of Census and Statistics, (DCS) bases its classification on employment and accordingly those establishments employing less than 25 persons is grouped under small and those employing over 25 persons is grouped as large scale.

Defining SMEs by the number of employees has also been widely used. This method is usually straightforward, but can also face some problems due to factor intensity of different industries. Moreover, part time workers and family workers, who function both as managers and workers, create some definitional problems. In Sri Lanka when measuring size by employment the following definitions are often used.

In this study, SMEs are defined as those employing less than 25 workers in according with the definition and the classification of the Department of Census and Statistic of Sri Lanka. This definition was also adopted by H.M.S Priyantha, (2004) in his study.

3.2. Advance Manufacturing Technology

The literature on Advanced Manufacturing Technologies (AMT) is split into separate areas, although they all are interconnected. When one considers AMT he needs to address fields such as: Investment, Assessment, Implementation, Development and Benefits of AMT. Numerous definitions for AMT have been presented. In a broad sense, AMT suggests both soft and hard technologies which are being employed to enhance manufacturing competencies (Chung et al., 2009). Previous studies reviews prove the influence of implementing AMTs on improving manufacturing productivity (Spanos, 2008; Koc et al., 2009). The term of AMT encompasses a wide group of computer-controlled technologies, which have been introduced within the past two decades. It happened because of new achievements in information technology. AMT basically refers to technologies related to manufacturing process. Such technologies are employed to store and control data to reduce process variability and product changeover costs, which consequently would lead to enhancement in both product quality and productivity. However, some AMTs have turned out to become a total failure, whereas some achieved satisfactory results, but yet to reach desired level (Singh et al., 2010).

3.3. Organizational Structure

There are numerous studies in AMT literature that exactly deal with strategic issues. In the middle of those, the organizational adjustment always has had a determining role. The definitions of an organizational design have been presented to integrate the technical and social systems. Various researchers stated that the exact benefits of the AMT adoption in the manufacturing companies can be achieved and materialized only in case of compatibility of the current organizational design, with the alterations to be confronted (Small, 2006).

According to Ghani et al. (2000), higher performance happens when a company opts for an AMT that fits its structure and its employees. As the organizational structure of SMEs is evolutionary, rather than being revolutionary, in many industrial firms, the match between structure and technology takes several years after implementation (Hajipur et al., 2011). Moreover, the acceptance of new technology in the organizations, which are naturally reactive to technological adoption and have no organized effort to exercise organizational change, would take longer time compared with more proactive and organizationally flexible firms. Preparing employees for the adoption, prior the start of the process, seems essential to

reach desired goals. Effective implementation of AMT mostly involves organizational and managerial atmosphere and practices, which are dissimilar to what is being appreciated and exercised in more traditional environments. The reason behind this is that the new technologies directly defy conventional strategic options and norms. Organizational culture denotes a general concept that defines the multifaceted areas of knowledge framework which employees apply to accomplish their duties and engender social/collective behavior. Ravasi and Schultz (2006) indicate that organizational culture provides guidance for organization members act and interpret in different situations through establishing a set of shared mental assumptions.

The literature review provides common characteristics of organizational structure types and reveals several definitions of organizational structure. “In essence, structure is the architecture of business competence, leadership, talent, functional relationships and management” (Wolf, 2002). Walton (1986) identifies structure as the basis for organizing, to include hierarchical levels and spans of responsibility, roles and positions, and mechanisms for integration and problem solving.

Organizational structure is defined in the Dictionary-Organizational Behavior (2003) as: “The established pattern of relationships among the components of parts of a company. The way that a company is set-up. The formally defined framework of an organization’s task and authority relationships”.

Organizational structure for Andrews (1995) “Consists of job positions, their relationships to each other (e.g., independent, part of a work-group or team, and reporting relationships) and accountabilities for process and sub-process deliverables”.

Sablynski (2003) succinctly defined organizational structure as “How job tasks are formally divided, grouped, and coordinated”. In “Organizational theory” Borgatti (1996) asserts an organization develops based on its size, its technology and its environmental requirements. Borgatti includes degrees and types of horizontal and vertical differentiation, control and coordination mechanisms, and formalization and centralization of power as determinants of organizational structure. Peguin (2003) supports Borgatti when commenting on horizontal and vertical differentiation by describing the up-down (vertical) communication linkages addressing efficiency and control, and the left-right (horizontal) communication linkages fill organizational needs for coordination and collaboration.

Scholl (2003) believes control and coordination are two essential functions performed by an organization structure. The first, “Control - Insuring that decision makers at all levels use the managerial or hierarchical constraint as one of the criteria in making their decisions”.

4. DATA ANALYSIS

According to the data collected by the researcher using the convenience sampling technique the following key findings has been observed during the data analysis. The main data gathering technique was questionnaires. The questionnaire is designed with clearly defined questions in the quantitative aspects. Scaling techniques are mostly used for measure the qualitative aspects in the questionnaire and ranking questions as well open ended questions are planned to be asked from the respondents in order to get a good combination of qualitative and the quantitative areas in the research.

The survey was conducted during October/November 2014 among the SMEs in western province. Collection of information from magazines, articles, and related research was done in the secondary data collection and from that the approach to the primary survey is taken. As per the finding most of the SMEs in the Sri Lankan context have not been adapted the AMT for their day today activities and on the other hand the period of adapting the technology is very recent years by looking at the trend that can be identify the new trend in adapting the technology in recent five years is very much high the reason may be the improvements in the organizational awareness of the technological adaptation.

■ Adaptors ■ Non Adaptors

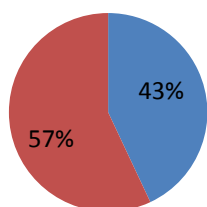


Figure 1: Technology adaptation

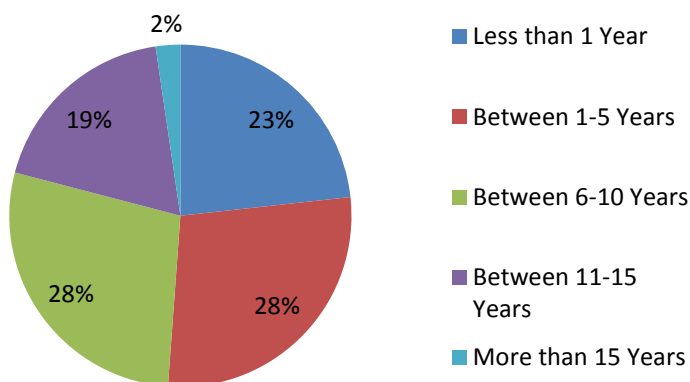


Figure 2: Age of Technology Adaptation

Most of the organizations have no proper organization structure since most of them are operated as a sole proprietary business and the most of the owners have the authority on the all the decisions from the operational decisions to strategic decisions. The sample have represent the all the types of organizations in the equal percentage.

Discussing the authority allocation and the responsibility allocation within the employees are in the minimum level which indicate the no proper organization structure. Most of the organization which not having the proper organization structure not having the proper adaptation of the technology which show the strong positive relationship.

Sample of 100 respondents includes 43% organizations which already adapting new technology to their day to day business operations majority of rest 57% organizations are to be adapted to new technologies they believe in the traditional manual operations. At the same time from the 43% of technology adaptors the 79% of the organizations adapted to the technology very recently which is less than 10 years' time period with the survey data that is proven the most of the SMEs are adapting technology in the recent competitive environment. Organization structure, culture and the manufacturing strategy shows a close relationship with the level of technology adaptation by the SME in Sri Lanka. From the target population 56% of the organizations have accepted that their organizations have not proper organization structure where the responsibility and the authority distribution happen. Same as the organizational culture 58% of the organizations are accepted that they have not operating in a culture where the innovations can be accepted. With the findings the other important finding was that the 58% of the organizations have not manufacturing strategy which can be used to achieve the existing level of customer satisfaction in the business operations but the human resource practices and the top management commitment toward the organizational growth is considerable in the SMEs in automobile sector in Sri Lanka. 49% of the organizations have the top management commitment as well as the better human resource practices to ensure the employee commitments to the organization.

5. CONCLUSION AND RECOMMENDATIONS

In the SME technology adaptation that is proven that the it helps to increase the customer satisfaction 58% of the organizations have accepted that the existing system have no capabilities to ensure the satisfy the customer requirements means that the SMEs need innovative technology to increase the customer satisfaction and also the 58% of the organizations have accepted that they cannot even achieve the current operational objectives with the current traditional and the manual operations. In that perspective the SMEs have real requirement of adapting innovative technology in increasing the standards of the products / service quality.

Small businesses can no longer allow themselves to be left behind their larger counterparts when it comes to new technology. There are now a whole host of cutting-edge innovations that smaller companies can make use of, such as cloud solutions, flexible working equipment. While all of these will not be of use to each and every company, it is important to consider investing in technology so SMEs do not lose ground on rivals, or in terms of industry best practice.

Solutions such as cloud technologies can enable an SME to build further scalability and flexibility into their organization and investing in this area now will provide a small business with the capability many larger firms have, which bodes well for future growth. In the perspective of the SME the level of technology adaptation will plays a major role in gaining competitive advantage over the competition as well the protecting the growth of the business in getting the long term sustainability over the dynamic environment in that the strengthen the internal organizational factors are very much considerable in the organizational perspective.

5.1. Recommendation to SMEs

In adapting the technology by the SMEs the barriers faced by the SMEs are mainly the internal organizational factors does not support for the adaptation of the technology. Which is the problem of the research where to adapt the technology the SMEs should be overcome those internal barriers in the organizations according with the survey done following recommendations can be made in the SMEs perspective for the SMEs improvements with the technology adaptation.

- 55% of the employees have not receive proper training and development to reduced that contribute employees in the organizational decision making process where the employees can make suggestions on the improvement of the organization.
- 58% of organizations have no systems for measure the customer feedbacks in the organizational decision making operational level employees are the best tool to measure the customer feedbacks with the experience they have with the handling customers
- 58% of organizations are not achieve the customer satisfaction at the same time 38% of the organization have not achieve the employee satisfaction as well ensure the employee satisfaction with the business which increase the customer satisfaction the tool for the measuring employee satisfaction with the employee turnover which indicates the employee satisfaction
- 57% of the organizations have not achieve the mutual trust between employees to ensure the integration of the organizational work flow provide the team culture in the organization with the employees which create more clarity and the reliability of the decisions made by the organizations where the SMEs as a whole having the aware about the business growth of the organization and the future as well.

ACKNOWLEDGEMENT

My profound gratitude to, Senior Lecturer, Dr. Renuka Herath, supervisor of my dissertation for the immense support, guidance and encouragement rendered to me at all times. My heartfelt thanks giving to, all the lecturers of Department of Marketing Management, University of Kelaniya, Sri Lanka for their support given to complete my research successfully. My sincere gratitude to my dearest parents for their vital encouragement given to me and to all my friends who helped to make this research project successful.

REFERENCES

- AMOAKO-GYAMPAH, K., Acquah, M. (2008). Manufacturing strategy, competitive strategy and firm performance: An empirical study in a developing economy environment. *International Journal of Production Economics*, 111(8), 575-592.
- AL-QIRIM, N. (2007).The adoption of E Commerce communications and application technologies in small businesses in New Zealand. *Electronic Commerce Research and Applications*, 6(4), 462-73.

- BARUA, B., Obaidul Islam, M. M. (2009). Key Success Factors for Implementation of Advanced Manufacturing Technologies (AMTs) Case Study Conducted on Selected Pharmaceutical Companies in Bangladesh. *AIUB Journal of Business and Economics*, 8(2), 53-67.
- BELL, M. (2006). How long does it take? How fast is it moving (if at all) Time and technological learning in industrializing countries? *International Journal of Technology Management*, 36 (1–3), 25–39.
- BEAUMONT, N., Schroder, R. (1997). Technology, manufacturing performance and business performance amongst Australian manufacturers. *Technovation*, 17(6), 297-307.
- BEAUMONT, N., Schroder, R., Sohal, A. (2002). Do foreign-owned firms manage advanced manufacturing technology better? *International Journal of Operations & Production Management*, 22(7), 759-771
- BOOTHBY, D., Dufour, A., Tang, J. (2010). Technology adoption, training and productivity performance. *Research Policy*, 39(10), 650–661.
- BOYER, K., Ward, P., Leong, G. K. (1996). Approaches to the factory of the future an empirical taxonomy. *Journal of Operations Management*, 14(1996), 297-313
- BOYER, K., Pagell, M. (2000). Measurement issues in empirical research: Improving measures of operations strategy and advanced manufacturing technology. *Journal of Operations Management*, 18(3), 361-374
- BRANDYBERRY, A., Rai, A., White, G.P. (1999). Intermediate performance impacts of advanced manufacturing technology systems: an empirical investigation. *Decision Sciences*, 30(4), 993–1020
- BURGESS, T. F., Gules, H. K. (1998). Buyer-supplier relation-ships in firms adopting advanced manufacturing technology: An empirical analysis of the implementation of hard and soft technologies. *Journal of Engineering and Technology Management*, 15(4), 127-152
- CASCIO, W. F. (2010). *Managing human resources: Productivity, quality of work life, profits*. McGraw-Hill/Irwin, New York
- CHEN, C. P., Liu, P. L., Tsai, C. H. (2008). A study of the influence of organizational knowledge ability and knowledge absorptive capacity on organizational performance in Taiwan's hi-tech enterprises. *Journal of Applied Sciences*, 8(1) 1138-48
- CHONG, S., Pervan, G. (2007). Factors influencing the extent of deployment of electronic commerce for small and medium-sized enterprises. *Journal of Electronic Commerce in Organizations*, 5(1), 1-29
- CHONG, A., Ooi, K. B., Lin, B., Tang, S.Y. (2009). Influence of inter organizational relationships on SMEs' e-business adoption. *Internet Research*, 19(3), 313-31

- CHUNG, W., Swink, M. (2009). Patterns of Advanced Manufacturing Technology Utilization and Manufacturing Capabilities. *Production and Operations Management*, 18(5), 533-545
- COSTA S.E.G., Lima, E.P. (2009). Advanced manufacturing technology adoption: an integrated approach. *Journal of Manufacturing Technology Management*, 20 (1), 74-96
- DANGAYACH, G. S., Deshmukh, S.G. (2003). Evidence of manufacturing strategies in Indian industry. *International Journal of Production Economics*, 83(3), 279-298
- EDWARDS-SCHACHTER, M., Castro- Martínez, E., Fernández-de-Lucio, I. (2011). International Co-operation between Firms on Innovation and R&D: Empirical Evidence from Argentina and Spain. *Journal of Technology Management & Innovation*, 6 (3), 126-147