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Technology Innovation for SME Growth: A Perception for the Emerging Economies

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Abstract

Globalization and technological transformations have triggered novel changes in both the developed and developing countries. Technology and entrepreneurship are vital tools used for national economies towards 21st century requirement and growth. Technology based enterprises are specifically smart to policy-makers because of their higher prospective for job creation and wealth-generation through business development as well as their lower disappearance rates compared to non-technology based firms. New technologies are often developed in R&D institutions. This initiative of providing incubation facilities to transfer these new technologies to the market is adopted by all growing institutions. A comprehensive review of the literature on the Technology innovation and SME's are carried out. This study specifically examines the drivers of technology adoption in SMEs and their impact on SMEs' performance - profit, growth and market share. In the developed countries technology development drives the incubator movement.

Keywords: Technology business incubators, Small and Medium-sized Enterprises (SME's), Emerging economies.

1. Introduction

There is a great need for any country to plan, to manage change in the context of globalization and focus on S&T intervention for heightening economic activity within the country to attain economic independence. Developed countries still retain their competitive improvement in the innovative and rapid growing industries of the future. Technological innovation is a key factor in a firm's competitiveness. Technological innovation is unavoidable for firms which want to develop and maintain a competitive advantage and/or gain entry in to new markets (Becheikh et al. 2006). There is a great need for any country to plan, to manage change in the context of globalization and focus on S&T intervention for heightening economic activity within the country to attain economic independence.

Developed countries still retain their competitive advantage in the innovative and fast growing industries of the future. Flexibility, mobility, and employability are key assets for workers and self-employed in the entrepreneurial economy.

Technology adoption in SMEs context is a growing area of interest in developing countries. There are established theories in technology adoption that have been extensively applied to western context. Many of these theories have not been widely applied to developing country context. Technology adoption is also crucial for the growth of business in the private sector (Manimala et al, 2012).

Objectives are to measure the impact of drivers of technology adoption on managerial attitude toward adoption of innovation, to assess the impact of managerial attitude toward adoption on innovation adoption behavior and to measure the impact of technological innovation adoption behavior on organizational performance.

2. Literature review

A review of literature that concerns how small and medium-sized enterprises (SMEs) develop new products and services are carried out. Organizational productivity can be achieved by adopting technological innovation. Reduce transaction cost, advertising and promotion cost, eliminating traditional supply chain, speedy communication with customers. SMEs are important business organs which form a strong constituent of the global economy. In most emerging countries economic growth and employment are led by SMEs. Innovation adoption enables SMEs to survive in tight competition, global economic crisis and compete against larger organizations. However, SMEs knowledge and capabilities to adopt technological innovation is limited. Financial institutions and government are less supportive to SMEs. Researchers believe that using a particular

system would enhance his or her job performance Sun and Zhang (2006); Talukder and Quazi (2010); Kim, Chan and Gupta (2007). The influence, motivation and encouragement given to an individual employee by peers or in the social network, Virtual network, Talukder and Quazi (2011); SMEs face unrelenting pressure from powerful customers and competitors to lower prices and accept shrinking margins on sales. They have responded to this pressure by adopting innovations in operational excellence, e.g., lean manufacturing and six-sigma. As these innovations approach their limits, SMEs are starting to seek revenue growth from new products and services. They must offer their customers something different than their competitors offer in order to avoid the same low-margin trap that they now face. This report suggests that a powerful way for SMEs to do this is to offer customers new products and services that allow more efficient and effective use of the products that they currently sell. These new products may complement existing products, and require new manufacturing and design skills, but offering new services is uncharted territory for most SMEs. Their service experience is often limited to offering customers free or below-cost installation, training, and maintenance. They must learn to offer services that can make their products yield greater total return over their useful life than can a competitor's products. These services include customization of products to specific customer uses, training for optimal performance, product disposal, and even taking over customer operations that pertain to the use of the product.

Among firms of different sizes, SMEs are generally more flexible, adapt themselves better, and are better placed to develop and implement new ideas. The flexibility of SMEs, their simple organizational structure, their low risk and receptivity are the essential features facilitating them to be innovative (Harrison and Watson 1998). Therefore, SMEs across industries have the unrealized innovation potential (Chaminade and Vang 2006). Vonortas and Xue (1997), while studying the process innovations of small firms in the USA, observed that economic incentives, internal resources, and technical and organizational competencies that a firm has developed or accumulated over time and a firm's linkage to external sources of expertise for learning about new technological development were the major forces that influenced these firms in adopting a process innovation.

Danneels and Kleinschmidt (2001) in the context of new product development argued that it consists of bringing together two main components: markets and technology. According to them, product innovation requires the firm to have competences relating to technology (enabling the firm to make the product) and relating to customers (enabling the firm to serve certain customers). These studies strongly indicate that neither internal competence of the firm nor customer requirements alone will drive a firm to undertake innovations. Innovation will emerge only when a technically competent firm is able to identify and respond to customer requirements by developing and/or improving products/processes.

Martinez-Ros (1999) found that product and process innovations are interdependent and closely linked. Lumiste et al. (2004) found that Estonian SMEs were engaged in developing their products together with processes. However, Becheikh et al. (2006) based on a review of literature covering empirical studies on innovation in the manufacturing sector, found that researchers have primarily focused on product innovations in SMEs, and therefore recommended that future research should consider both product and process innovations.

Economic globalization implies a growing interdependence of locations and economic units across countries and regions (Narula and Zanfei, 2005). This may create new opportunities for stakeholders in 'catching up' countries to participate in global economic activities. In this section, the transformation of economic activities at global level is reviewed with particular attention to its governance structure and knowledge flows.

The importance of SMEs in a global economy

Global economic integration is changing the competitive paradigm in which all businesses operate, requiring an international expansion strategy to positively impact long-term growth and survival (Karagozoglou and Lindell, 1998). The small business sector has become more important as they emerge as a dominant force impacting the growth of national economies (Shridhar, 2006). There are a number of disadvantages inherently faced by SMEs as they transition into international environments (Chen and Huang, 2004). Managers of non-exporting SMEs perceive the international environment as being risky, unprofitable and unmanageable, due primarily to misinformation and lack of experience with global business (Malekzadeh and Nahavandi, 1985). SMEs, due to their size limitations, often have limited financial capital and a lack of necessary human resources. Many operators of small businesses lack experience in developing an international strategy (Tesar and Moini, 1998). There are also disadvantages related to a lack of competitive power as a consequence of the size of the organization. SMEs have difficulty in influencing global pricing as they rely on a small customer base, and are limited in expansion due to minimal access to financial resources (Kalantaridis, 2004).

Even though faced with the need to overcome significant weaknesses, the strategic importance of SMEs has been identified as the following:

- they are responsible for growing employment at a faster rate than larger organizations;
- they increase the competitive intensity of the market and reduce the monopolistic positions of large organizations; and
- they encourage the development of entrepreneurial skills and innovation.

SMEs, in the USA, account for three out of every four new jobs and contribute to providing over half of the gross domestic product (Underwood, 2004). From 1992 to 1999, the number of SMEs that were involved in exporting increased over 100 percent, to nearly 97 percent of all exporting firms in the USA, and accounting for $168.5 billion in value (Underwood, 2004).

The importance of Incubators in economy growth

In Middle East and the United States of America The study concludes clearly the goal of business incubators is entrepreneurship, jobs creation, research commercialization, and profitable enterprises (Al-Mubaraki and Busler, 2012a).

In developing countries, such as Asia the Business Incubations are critical drivers of social and economic development. With increasing awareness around the world, to promote innovation and entrepreneurship (96%), policymakers and other stakeholders increasingly view business incubation as an important tool to create sustainable jobs (60%). In addition, they thrive in their key performances showing a 90% success rate in the youth sector and 82% in technology sectors (Al-Mubaraki and Busler, 2012b).

In Latin America throughout a careful review of the published literature and the analysis of the key variables of business incubators is an effective tool for: 1) foster entrepreneurship, 2) reduce unemployment, and 3) technology transfer (Al-Mubaraki and Busler, 2012c).

In France, the innovation-based incubators are powerful tools for local economic development; the business incubator provides business support to young companies with the goal of producing smart growth for developing the economy based on knowledge and innovation. The process of business incubation to develop the business idea and transforming it into a viable and sustainable activity (Al-Mubaraki and Kolo, 2012).

The authors state that incubators serve to deliver economic development and jobs creation, among promoting business growth through incubator clients (incubatees) and graduate companies in the communities which exist (Al-Mubaraki and Busler, 2012a).

The study findings indicate the strategic benefits of innovation worldwide: (1) Incubators offered tangible and intangible services, (2) most Incubators Type are mixed technology type, (3) Incubators objectives focuses on the innovation. The conclusions that can be drawn overall that innovations are a vital tool for technology transfer, jobs creation, entrepreneurship and commercializing technology (Al-Mubaraki and Busler, 2012b).

Twelve international case studies indicate that in order for business incubator to obtain sustainability of graduation companies are reliant upon: 1) clear incubator objectives, 2) incubators age, 3) ratio of client and graduate companies, and 4) employment rate. When accomplished, this can lead to a 90% survival rate of companies and reflects sustainability in the market. Therefore, incubators are an active tool for economic development, job creation, technology transfer and sustainable graduation success of entrepreneurs as well as expansion of existing companies (Al-Mubaraki and Wong, 2012).

Constraints to SME Development

In the face of the potential role of SMEs to enhanced growth and job creation in developing countries, a number of tailbacks affect their ability to realize their full potential. SME development is vulnerable by a number of factors, including finance, lack of managerial skills, equipment and technology, regulatory issues, and access to international markets (Gockel and Akoena, 2002). The lack of managerial know-how places significant

constraints on SME development. Even though SMEs tend to draw motivated managers, they can hardly compete with larger firms. The scarcity of management talent, prevalent in most countries in the region, has a magnified impact on SMEs. The lack of support services or their relatively higher unit cost can hamper SMEs' efforts to improve their management, because consulting firms are often not equipped with appropriate cost-effective management solutions for SMEs. Besides, despite the numerous institutions providing training and advisory services, there is still a skills gap in the SME sector as a whole (Kayanula and Quartey, 2000). This is because entrepreneurs cannot afford the high cost of training and advisory services while others do not see the need to upgrade their skills due to complacency. In terms of technology, SMEs often have difficulties in gaining access to appropriate technologies and information on available techniques (Aryeetey et al., 1994). In most cases, SMEs utilize foreign technology with a scarce percentage of shared ownership or leasing. They usually acquire foreign licenses, because local patents are difficult to obtain. Regulatory constraints also pose serious challenges to SME development and although wide ranging structural reforms have led to some improvements, prospects for enterprise development remain to be addressed at the firm-level. The high start-up costs for firms, including licensing and registration requirements, can impose excessive and unnecessary burdens on SMEs. The high cost of settling legal claims, and excessive delays in court proceedings adversely affect SME operations. In the case of Ghana, the cumbersome procedure for registering and commencing business are key issues often cited. The World Bank Doing Business Report (2006) indicated that it takes 127 days to deal with licensing issues and there are 16 procedures involved in licensing a business in Ghana. It takes longer (176 days) in South Africa and there were 18 procedures involved in dealing with licensing issues. Meanwhile, the absence of antitrust legislation favours larger firms, while the lack of protection for property rights limits SMEs' access to foreign technologies (Kayanula and Quartey, 2000).

Previously insulated from international competition, many SMEs are now faced with greater external competition and the need to expand market share. However, their limited international marketing experience, poor quality control and product standardization, and little access to international partners, continue to impede SMEs' expansion into international markets (Aryeetey et al., 1994). They also lack the necessary information about foreign markets. One important problem that SMEs often face is access to capital (Lader, 1996). Lack of adequate financial resources places significant constraints on SME development. Cook and Nixson (2000) observe that, notwithstanding the recognition of the role of SMEs in the development process in many developing countries, SMEs development is always constrained by the limited availability of financial resources to meet a variety of operational and investment needs. A World Bank study found that about 90% of small enterprises surveyed stated that credit was a major constraint to new investment (Parker et al., 1995). Levy (1999) also found that there is limited access to financial resources available to smaller enterprises compared to larger organisations and the consequences for their growth and development. The role of finance has been viewed as a critical element for the development of SMEs (Cook and Nixson, 2000). A large portion of the SME sector does not have access to adequate and appropriate forms of credit and equity, or indeed to financial services more generally (Parker et al., 1995). In competing for the corporate market, formal financial institutions have structured their products to serve the needs of large corporates. A cursory analysis of survey and research results of SMEs in South Africa, for instance, reveals common reactions from SME owners interviewed. When asked what they perceive as constraints in their businesses and especially in establishing or expanding their businesses, they answered that access to funds is a major constraint. This is reflected in perception questions answered by SME owners in many surveys.

3. Conclusion

Small and Medium Enterprises (SME's) are the driving force for the promotion of an economy. Impact of technology adoption is influential in improving the performance of SMEs. The research on drivers of technology adoption helps ominously the organizational acuity toward usage of technological innovation. The improved perception of technology leads in the tendency toward usage behavior of innovation at the organizational level. Technology adoption behavior significantly improves organizational performance in term of profit, growth and market share of Indonesia SMEs. This work benefits SMEs in term of providing guideline to improve their financial make up. Actual usage of technology is instrumental for SMEs to not only improve their business performance but also significantly contribute to the national economic growth

References

Al-Mubaraki, H and Wong, S.F. (2012). A Preliminary View of the Relationship between Incubator Performance and their Length of Establishment. USM-AUT International Conference (UAIC), Sustainable Economic Development, 17-18 November, 2012, Bayview Beach Resort, Penang.

Al-Mubaraki, H. and Kolo, J. (2012). Incubators Based on Innovation in France. WASD 10th International Conference 2012, Abu Dhabi, United Arab Emirates, 19-21 November, 2012.

Al-Mubaraki, H. and Busler, M. (2012a). Best Practice of Business Incubator. International Journal of Arts & Sciences (IJAS) conference for academic disciplines, Germany, April 8-13, 2012. [Online] Available: http://ijasgermany2012apr.sched.org/event/1731fcbb7fb2e14a465184240c782347#

Al-Mubaraki, H. and Busler, M. (2012a). Middle East toward Incubator Benefits: Case Studies., ICBMEF 2012: International Conference on Business, Management, Economics and Finance, Dubai, UAE, January 29-31, 2012.

Al-Mubaraki, H. and Busler, M. (2012b), Entrepreneurship Spirit of Asia Business Incubation. Academic and Business Research, San Antonio, USA, March 22-24, 2012. [Online] Available: http://www.aabri.com/SA12Manuscripts/SA12036.pdf

Al-Mubaraki, H. and Busler, M. (2012b). Exploring Strategic Benefits of Innovation Worldwide. Academic and Business Research Institute International Conference - Las Vegas 2012, October 4 - 6, 2012. [Online] Available: http://www.aabri.com/LV2012Manuscripts/LV12082.pdf

Al-Mubaraki, H. and Busler, M. (2012c). Spark of Business Incubators Roles: Latin American Case Studies. The Ninth International Conference of Global Academy of Business & Economic Research October 4-5, 2012, Sheraton LaGuardia East Hotel, New York, USA.

Aryeetey, E., Baah-Nuakoh, A., Duggleby, T., Hettige, H. and Steel, W.F. (1994). Supply and Demand for Finance of Small Scale Enterprises in Ghana. Discussion Paper No. 251, World Bank, Washington, DC.

Becheikh, N., Landry, R. and Amara, N. (2006). Lessons from Innovation Empirical Studies in the Manufacturing Sector: A Systematic Review of the Literature from 1993–2003. *Technovation*, 26 (5/6): 644–64.

Chaminade, C. and Vang, J. (2006). Innovation Policy for Asian SMEs: an Innovation Systems Perspective, in H. Yeung Handbook of Research on Asian Business. Edward Elgar.

Chen, H. and Huang, Y. (2004). The establishment of global marketing strategic alliances by small and medium enterprises. *Small Business Economics*, Vol. 22, pp. 365-77.

Cook, P. and Nixson, F. (2000). Finance and Small and Medium-Sized Enterprise Development. IDPM, University of Manchester, Finance and Development Research Programme Working Paper Series, Paper No 14.

Danneels, E. and Kleinschmidt, E.J. (2001). Product Innovativeness from the Firm's Perspective: Its Dimensions and their Relation with Project Selection and Performance. *The Journal of Product Innovation Management*, 18: 357–73.

Gockel, A.G. and Akoena, S.K. (2002). Financial Intermediation for the Poor: Credit Demand by Micro, Small and Medium Scale Enterprises in Ghana. A Further Assignment for Financial Sector Policy?. IFLIP Research Paper 02-6, International Labour Organisation.

Harrison, N.J. and Watson, T. (1998). The Focus for Innovation in Small and Medium Service Enterprises. Conference Proceedings of the 7th Annual Meeting of the Western Decision Sciences Institute, 7–11 April, Reno, NV, USA.

Kalantaridis, C. (2004). Internationalization, strategic behavior, and the small firm: a comparative investigation. *Journal of Small Business Management*, Vol. 42 No. 3, pp. 245-62.

Karagozoglou, N. and Lindell, M. (1998). Internationalization and small and medium sized technology-based firms: an exploratory study. *Journal of Small Business Management*, Vol. 36 No. 1, pp. 44-59.

Kayanula, D. and Quartey, P. (2000). The Policy Environment for Promoting Small and Medium-Sized Enterprises in Ghana and Malawi. Finance and Development Research Programme, Working Paper Series, Paper No 15, IDPM, University of Manchester.

Kim, H.W., Chan, H.C., and Gupta, S. (2007). Value-based adoption of mobile internet: An empirical investigation. *Decision Support Systems, 43*(1), 111-126.

Lader, P. (1996). The Public/Private Partnership. Springs Spring, 35(2), pp. 41-44.

Levy, B., Berry, A. and Nugent, J. (1999). Supporting the Export Activities of Small and Medium Enterprise (SME) in Levy, B., Berry, A. and Nugent, J. B. (eds.), *Fulfilling the Export Potential of Small and medium Firms*, Boston, MA, Kluwer Academic Publishers.

Lumiste, R., Lumiste, R. and Kilvits, K. (2004). Estonian Manufacturing SMEs Innovation Strategies and Development of Innovation Networks. Paper presented at the 13th Nordic Conference on Small Business Research, 10–12 June, Tromsø, Norway.

Malekzadeh, A.R. and Nahavandi, A. (1985), "Small business exporting: misconceptions are abundant", American Journal of Small Business, Vol. 9 No. 4, pp. 7-14.

Manimala, Mathew J., Vijay, and Devi. Technology Business Incubators (TBIs): A Perspective for the Emerging Economies (April 30, 2012). IIM Bangalore Research Paper No. 358. [Online] Available: SSRN: http://ssrn.com/abstract=2117720 or http://dx.doi.org/10.2139/ssrn.2117720

Martinez-Ros, E. (1999). Explaining the Decisions to Carry out Product and Process Innovations: The Spanish Case. *The Journal of High Technology Management Research*, 10 (2): 223–42.

Narula, R. and Zanfei, A. (2005). Globalization of innovation: The role of multinational enterprises. *The Oxford Handbook of Innovation*, J. Fagerberg, D. C. Mowery and R. Nelson (eds). Oxford: Oxford University Press: 318-345.

Parker, R., Riopelle, R .and Steel, W. (1995). Small Enterprises Adjusting to Liberalisation in Five African Countries. World Bank Discussion Paper, No 271, African Technical Department Series, The World Bank, Washington DC.

Shridhar, M. (2006). Incubators and science parks: strategies for developing countries. [Online] Available: www. anprotec.org.br/idisc/pdfs/publiacoes/155.doc (accessed 2 July), pp. 1-20.

Sun, H. and Zhang, P. (2006). The role of moderating factors in user technology acceptance. *International Journal Human-Computer Studies, 64*, 53-78.

Talukder, M. and Quazi, A. (2010). Exploring The Factors Affecting Employees' Adoption and Use of Innovation. *Australasian Journal of Information Systems 16* (2)*, 1-29*

Talukder, M. and Quazi, A. (2011). The impact of social influence on individuals' adoption of innovation. *Journal of Organizational Computing and Electronic Commerce, 21*(2), 111-135.

Tesar, G. and Moini, A.H. (1998). Longitudinal study of exporters and nonexporters: a focus on smaller manufacturing enterprises. *International Business Review*, Vol. 7, pp. 291-313.

Underwood, T. (2004). Export Assistance for Small and Medium Sized Enterprises Offered by the International Trade Administration, US Department of Commerce, Washington, DC, US DOC/ITA/TD/OEABO/Small and Minority Exporters Division (accessed 23 March, 2010), p. 23.

Vonortas, N.S., and Xue, L. (1997). Process Innovation in Small Firms: Case Studies on CNC Machine Tools. *Technovation*, 17 (8): 427–38.

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