Barriers and Challenges for Technology Transfer in Malaysian Small and Medium Industries

M.A. Burhanuddin, Fahmi Arif, V. Azizah
1Faculty of Information and Communication Technology
2Institute of Tech. Management and Entrepreneurship
Universiti Teknikal Malaysia Melaka,
Ayer Keroh, 75450 Melaka, Malaysia
E-mail: burhanuddin@utem.edu.my,
fahmi_ra@utem.edu.my, azizahaheed@gmail.com

Abstract— Small and medium-scale industries (SMI) have played a very important role in Malaysian economy. Particularly in terms of employment generation, better income distribution and as a training ground for entrepreneurs before investing in a larger scale businesses. However, there are many factors inhibiting the adoption of new technologies especially related to Information and Communication Technology (ICT) in the challenging world today. It is important to identify the primary obstacles they face with regard in adopting new technology. In order for them to survive in a long run, this study identifies problems and constraints faced by SMI in Malaysia. Then, focus on the challenges and barriers for them in adopting new technology. The researchers visited few food-processing SMI in the Southern Region of Malaysia and make comparison with few important publications on SMI development.

Keywords- ICT adoption, small and medium industries, barriers and challenges

I. INTRODUCTION

The fast-changing global industrial environment is forcing companies to improve their competitiveness by acquiring new technical skills and investing in more advanced technologies. However, there are many factors inhibiting the adoption of new technologies, particularly by Small and Medium Industries (SMI). SMI play an important role in sustaining domestic and regional economic growth, in addition to being important agents for alleviating poverty in developing countries. SMI also play a pivotal role in innovation and productivity growth [1]. According to Small and Medium Industri Corporation (SMIDEC), SMI are defined as companies with capital less than RM1 million and their annual sales turnover not exceeding RM25 million. Their full-time employees are not exceeding 150 people.

SMI in Malaysia play an important role in the country’s economic development it stimulate private ownership and entrepreneurial skills; provide broad based sources of growth whilst also acting as incubators for developing domestic enterprises into large corporations. However, SMI contribution to the economy is still relatively small. In recognition of this, the Malaysian government put priority to develop SMI sectors.

This is reflected in the national development agendas, namely the Ninth Malaysia Plan and the Third Industrial Master Plan (IMP3), in which the key strategies for SMI development is extended from 2006 to 2010 and 2006 to 2015 periods respectively. The 2005 Census of Establishment and Enterprise (Census) found that the bulk of business establishments (99.2%) are SMI, of which about 80% are micro enterprises. The Census results also show that SMI are a major source of employment, providing jobs for over 5.6 million workers and accounting for 56% of total employment. However SMI contribution to the economy is still disproportionately low - SMI contributed only 32% of gross domestic product and 19% of the total export value. Similarly, productivity levels in the SMI were found to be significantly lower than large enterprises as they generated an average value added per employee of just RM14, 740, far lower than the RM47, 830 generated by large enterprises [2].

Current research has shown that SMI play an important role in the economic development of countries worldwide [3]. In order for SMI to survive for more than a few years in markets where there are large competitors, they must nullify their size disadvantages either by forming alliances with similar firms to increase the rate of market penetration and reduce financial risk, or by utilising technology to overcome diseconomies of scale and to produce innovations which differentiate themselves significantly from larger competitors. Because of SMI limited resources and relative inability to absorb the costs and risks associated with in-house technology development, they must often utilise the process of technology transfer to take advantage of the benefits gained by technology and innovation. For that reason, [4] conclude that in small size company, the successful of technology transfer is a pre-requisite for company performance.

Considering that SMI have the potential to contribute positively to a country's economic development and that an SMI's ability to innovate has an impact on its ability to survive in the long run, it is important to identify the primary obstacles they face with regard in adopting new technology and acquisition and to create tools and policies designed to help them overcome these specific challenges.
This paper takes a first step in identifying challenges and barriers faced by SMI in Malaysia as the basic foundation for strategy development which can be used to overcome the aforementioned challenges faced by SMI with regard to adopting technology and acquisition.

II. CONCEPT OF TECHNOLOGY TRANSFER

Technology transfer is use of the knowledge. In other words, technology transfer or transfer of technology means the transfer of knowledge. [5] considered that the transfer is success when the technology is brought into market. Therefore, transfer is not just a movement or delivery, but the transfers can only success if technology is utilized [6]. So, it is application of technology and considered as process by which technology developed for one purpose is used either in a different application or by a new user. Technology transfer can also be described as the process through which technology moves from outside sources to the organization. The complexity of this transfer process has been examined by a growing number of researchers whose findings are being impact upon technology policy decision making [8].

III. BARRIERS FACING BY SMI

In today globalised economy, Malaysian SMI will not be able to compete successfully without making much more effective use of Information Technology. However, despite of their important contribution to exports, domestic supplies, employment and economic growth, there is a wide discussion about the barriers facing by local SMI. The barriers prevent them from growing further and putting them in a critical position to face the new challenges that are arising from globalization, liberalization and extensive organizational and technological change. It has been documented that the barriers facing SMI in Malaysia undermine their performance. The researchers, [8], [9], [10], [11], and [12] highlighted many barriers and problems facing by SMI to compete in a globalized market, which includes:

(i) Many SMI are still occupying land sites which have not been approved for industrial use purposes;
(ii) Poor financial strength;
(iii) Low productivities;
(iv) Lack of skills for the new business environment,
(v) Lack of capabilities accessing to management and technology; and
(vi) Heavy regulatory burden and procedures.

The findings are supported by [13], where he highlighted that lack of access to the financial system, human resource constraints and limited or inability to adopt technology is the problem in SMI.

Malaysian government realized the problem and play an important role to sustain SMI in the second Industrial Master Plan (IMP2). Then, followed by the IMP3 from 2006 to 2020, to coincide with the country’s vision for 2020 [14].

The Malaysian Government has implemented various policies and strategies under these plans. The IMPs were formulated to enhance the growth of the manufacturing sector across the entire value chain and cluster-based industrial developments. Hence, this plan provides an integrated approach to the development of industrial areas and opportunities for growth of SMI [14]. Figure 1, below, shows the phases of development of enterprises in Malaysia Small and medium enterprises in many countries face myriad challenges.

IV. CONSTRAINTS OF SMI IN ADOPTING NEW TECHNOLOGY

[15] stressed that the global industrial environment is forcing companies to improve their competitiveness by acquiring new technical skills and investing in more advanced technologies. However, there are many factors inhibiting the adoption of new technologies, particularly by local SMI, including:

(i) Lack of capital investment funds;
(ii) Lack of managerial skills;
(iii) Inaccurate data and information on the progress of SMI;
(iv) Lack of skilled and talented workers, which affects the quality of production, efficiencies and productivities;
(v) Limited capacity for technology management and knowledge acquisition;
(vi) Limited access to finance and capital, and the infancy of venture funds in initial or mezzanine financing;
(vii) Difficulties to consult industrial expert; and
(viii) Limited staff to conduct research in new technology and innovations;

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Figure 1 : Phases in SMI development [12]
[13] concluded that SMI are unable to survive in a long run, if they do not increase their competitiveness in the new rapidly developing world of globalization. To achieve business excellence [16] stated that organization need to adopt information and communication technology. Appropriate information and communication technology can help SMIs to cut their cost by improving internal process, faster communication with customer, better promotion and better distribution [17].

SMI still seem to have a painful time in deciding how best to adopt technology in their business. The fact that most SMI are still fully controlled by their founders who are IT-illiterate. Research finding by [1] show that SMI owner in Malaysia posses below-average ICT skill, as the result, level of ICT adoption is lower than expected. Generally, the best way to combat this is through education and IT awareness.

V. SMI CHALLENGES IN MALAYSIA

As discussed, there are a number of barriers and constraints hinder technology transfer and development in SMI. Particularly important in this context is the information about the requirements for foreign technology and the problems associated with the transfer process, such as options, conditions, absorption and diffusion [18]. Moreover, Malaysian SMI face many challenges, which have been highlighted by [19], SMI development Plan, 2001-2005 [12] and [20]. Later, [21] conducted the survey and listed few SMI challenges to produce locally and market globally as follows:

(i) Intensified global competition;
(ii) Price competition with other producers, such as Indonesia, China, Thailand and India;
(iii) Ability to meet the challenges of market liberalization and globalization;
(iv) Non-compliant products to ISO quality standard,
(v) Expensive infrastructure, and
(vi) Motivation to seek latest information and update the knowledge.

The present study summarized challenges in Malaysian SMI as follows:

(i) Lack of a comprehensive framework in terms of policies towards SMI development,
(ii) Agencies use inconsistent definitions to categorize SMI at the operational level,
(iii) There are too many agencies, or channels, for SMI without effective coordination. This led to redundancy afford and effect transparency to the target groups,
(iv) Lack of transformation and monitoring SMI progress from micro to large-scale business,
(v) Difficulties in accessing loans and other forms of financial assistance,
(vi) Underutilization of technical assistance, advisory services and other incentives made available by the government and non-government organisations.

(vii) Non-leveraging of various incentives which are provided by the promotion of Investment Act, 1986 and the Income Tax Act 1967.
(viii) Time consuming to investigate new systems;
(ix) Limited knowledge on capabilities of the current systems;
(x) Lack of information on potential markets and customers; and
(xi) Global competition.

VI. SUMMARY AND RECOMMENDATION

The present study compares few research works on constraints, barriers and challenges facing by Malaysian SMI’s to adopt the technology. This is because the SMI contribution to the economy in Malaysia is still relatively small compared to other developed countries. The evidence show that productivity levels in the SMI were found to be significantly lower than large enterprises as they generated an average value added per employee of just RM14, 740, far lower than the RM47, 830 generated by large industries [2].

Some of the major constraints and problem identified from the previous work are financial issues, low productivities, managerial skill, technological skills, research and development, expertise, human resource and global competition. Some of the major challenges they are facing are lack of a comprehensive framework in terms of policies towards SMI development, too many agencies without effective coordination, inaccuracy of data, difficulties in getting loans on time, underutilization of technical assistance, lack of skilled and talented workers, expensive infrastructure and price competition with other competitors from other countries such as Indonesia, China, Thailand and India.

In general Malaysian SMI are still not prepared to challenge in a global market. There are still many SMI think that technology investment especially in IT as necessary only for large industries and they believe that IT only for automation process in manufacturing. Sometime they fell IT adds no value and used to reduce a manpower. Infact, practising IT can enable SMI to improve their business models, encourage marketing strategies and create advance customer relationships.

Considering those issues of barries, constrains and challenges, SMI extremely need strategies to overcome that situation. There are many strategies derived by government and its agencies such as Small and Medium Industri Corporation, Federal Agriculture Marketing Authority, Malaysian Agriculture Research and Development Institute etc., that can be adopt by SMI [21]. However, SMI in Malaysia can follow, but not totally rely on government agencies. They have to be more independent and start to initiate their own path of progress by adopting different strategies, which allow them to success in global markets, increase their revenue and expand their business. The SMI should work together as a business partner and implement these strategies. This paper provides a platform for further studies on appropriate strategies that can support Malaysian SMI in defeating those barries and challenges.
REFERENCES


