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Procedia - Social and Behavioral Sciences 224 (2016) 508 – 515

Procedia
Social and Behavioral Sciences

6th International Research Symposium in Service Management, IRSSM-6 2015, 11-15 August
2015, UiTM Sarawak, Kuching, Malaysia

An Overview of Technological Innovation on SME Survival: A Conceptual Paper

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Abstract

This paper explores the theoretical review of technological innovation on SME survival by looking at literature review with SME studies. Previous reference on survival is still scarce even it is the key benchmark to measure business performance. It has been demonstrated within the literature that the practice of technological innovation is significantly associated with business performance but its effect towards SME survival is underexplored. SME survival refers to the year of business operation, availability of future plans and diversity of product/service range. According to social scientists and management experts, among the main technological innovations highlighted in literatures are namely sophisticated machines and equipments, fusion of different technologies, gadgets machines and equipments, fusion of different technologies, and gadgets as tools of innovation. By looking at the technological innovation scope by Diaconu (2011); social networking, computerized record, online marketing can be categorized under the current technological innovation as these mediums are based on technology and influence the development intensity with new or improved process or products. Apart from this justification, among other approaches, these three mediums are close to the business and its potentials are yet to be optimized. In short, the critical discussion provided in this paper would help to strengthen the body of knowledge on SME studies, besides to act as a reference for research in other countries. Findings from this review shed some lights on the potential of social networking as part of online marketing; as the online customers are greater than the typical offline customers. Also, the effect of online marketing via social media is more powerful and diverse due to its ability to reach customers regardless of geographical locations.

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Peer-review under responsibility of the Universiti Teknologi MARA Sarawak

Keywords: SME survival; innovation; small business; technology; Malaysia

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1. Introduction

SME studies are getting more attention since early 1950s in Western countries especially after United states initiate the Small Business Administration (SBA) established by Congress under Small Business Act (Cull, Davis, Lamoreaux & Rosenthal, 2006; Bischoff, 2011) meanwhile, SME started to become Malaysian government's main priority from early 1970s with the development of New Economic Policy (Saleh & Ndubisi, 2006). Since that, from the fundamental question on SME start-up, business funding to SME internationalization process, technology always happen to be the important variables for SME (Chong, 2012; Rahman, Yaacob & Radzi, 2014). Technology alone is basically referred to the machinery, tools and instrument to speed up business operations (Radam, Abu & Abdullah, 2008; Saunila, Pekkola & Ukko, 2014) whereas innovation, on the other hand, manages to inculcate the culture of creating something new and valuable whether a new product or service, production process, structure or administrative system (Hult, Hurley & Knight, 2004; Tseng, 2014). In general, SMEs operate at low levels of technology which generate lower productivity. Based on a SME Census 2011 (Department of Statistics Malaysia), 67 percent of Malaysian SME is IT literate and use the internet for personal purposes. However, only 23 percent utilize Information Communication and Technology (ICT) for business operation (see SMEinfo, 2011). This fact is a clear sign that IT literacy does not guarantee that SME use technology to improve performance. With this in mind, it leads to the current literature which shifting the study focus from IT literacy or IT acceptance to the knowledge sharing on how technology benefits business. Scarcity in the literature warrants a theoretical review on SME survival. Overcoming challenges, finding adequate financing, are not the only setback for SME to be successful. Current findings proposed that more studies are required to study business survival before performance and determinants of successful business come into practice. The growing number of business failure and higher failure rate for infant business demands SME survival to be the center of attention with technological innovation acting as the medium leading to higher survival rate in Malaysia. In this connection, this paper aims to review the relationship between the technological innovation and SME survival based on current literature review.

2. The impact of technological innovation on SME

This section is divided into four sections. The first part will discuss the current work related to technological innovation and describe what the criteria are for SME Survival. Next, the literature explains the theoretical framework and each variable in this study are critically discussed. Subsequently, this paper describes the research methodology and at the end of this paper, there are suggested directions for future research.

Small and medium enterprise (SME) has different terms and definitions according to countries. Particularly the size, full time employees and sales turnover are the main criteria in separating SME worldwide (SME Corporation, 2011a). In fact, there is no established definition of SMEs (Hooi, 2006) because it is difficult to formulate a universal definition (Scheers, 2011) as the economies of countries vary and most of the scholars adopt specific standards for SME based on specific purposes (SMEinfo, 2011). Definitions of Malaysian SME refer to the fixed quantitative measure which is the total number of employees and looking at the business sales turnover (Omar, Arokiasamy & Ismail, 2009). In Malaysia alone, 99 percent of the overall business entities are SME. There are three major sectors in Malaysia to be exact; Services, Agriculture and Manufacturing. SMEs contribute 31 percent of the nation's Gross Domestic Product (GDP) and share 56 percent of the total job employment (SMEinfo, 2011). The description of small business from SME Corporation Malaysia (2013) simply stated that SME segregation also depends on the sales turnover. For instance, small business across all sectors, the sales turnover must be less than RM300,000 to RM15 million or full-time employees not exceeding five to 75 full-time employees (revised 1 January 2014).

Over the years, SME studies are no longer put a spotlight attention on SME challenges per se. Current researchers are shifting from emphasizing the drawbacks to finding solution or remedy to overcome those issues. Notwithstanding the severity of SME challenges, most of the challenges are studied in a mass publication starting from the year 1994 in a survey initiated by Asia-Pacific Economic Cooperation (APEC) until the year 2009 before the topic is deemed as not current to the literature review. Then, scholars are turning their interest to study SME performance and success factor which significantly heading towards proposing frameworks and models to improve the SME industry from 2009 up till the year 2014 (Inyang & Enuoh, 2009; Chittithaworn, Islam, Keawchana &

Yusuf, 2011; Makhbul & Hasun, 2011, Oyeku, Oduyoye, Asikhia, Kabuoh & Elemo, 2014; Iorun, 2014). Findings from these studies, proposed that technology is the determinants of SME success. Among others, Tidd and Bessant (2010) defined successful SMEs as those who innovate by adopting technologies with the intention of providing them with market competitive edge. In other words, they claimed that SMEs that practice innovation show growth and sustainable performance compared to others who do not use technology.

Further, technology also had been placed as one way to practice innovation in business. As in Littunen (2010) study, innovation is divided into four main types which are innovation in terms of product, process, market and organizational. Each of these types relies on technology as medium to innovate both through the social networking, free access to information via internet and also machines or technology tools in business operation. Overall, the author agreed that growth, success and firms' survival are depending on the firm's ability to innovate on a continual basis. Interestingly, it is very exceptional for researcher to highlight on SME Survival but there are also studies that mentioned regarding this issue. For instance, based on a study in 2005, Ramayah, Yan and Sulaiman had touch on the surface of SME survival by bringing up important factors to sustain a long-term business survival is to continuously keeping the relevancy and maintain business competitiveness regardless of sectors and country of origin.

Specifically in Malaysia, technology and innovation started to be center of interest for professional researcher for SME since 2004 with the SME Masterplan 2012-2020. Currently, reference are been tailor made to match the role that entrepreneurs should play in stimulating innovation which proposed the existence of a strong connection between innovation and entrepreneurial activity (Zhou, Tan & Uhlaner, 2007; Littunen, 2010) and portrays entrepreneurs as innovator (Schumpeter, 1965 as cited in Marcari et. al., 2008; Abdullah, Shamsudin, Wahab & Hamid, 2012). Based on the SME Census from Department of Statistics Malaysia, 86.6 percent of SME do not utilize online marketing especially the micro enterprise with only 10 percent usage compared to small and medium marketing media usage by 22.7 percent and 36.8 percent respectively (SMEinfo, 2011). This is considered as missing link in achieving business success as online marketing which has been highlighted in past studies as the competitive strategy for SME to market themselves among other businesses (Raman & Annamalai, 2011).

Besides, world had witnessed that technology helps business to expand market share and look up for new idea for business growth. Yet, this is where the geographical expansion leads to a problem (Pirich, Knuckey & Campbell, 2001; Cull et. al., 2006) on how to reach the customers in distance. Again, technology comes in with emerging economy booster through the social networking (Littunen, 2010; Naude, Zaefarian, Tavani, Neghabi & Zaefarian, 2014; Chohan, Oskenbayev, Aman & Youssuf, 2015), computerized record (Saad & Mazzarol, 2010; Osotimehin, Jegede, Akinlabi & Olajide, 2012) and online marketing (Reiss, 2006; Littunen, 2010; Lee, Park & Shin, 2012). Many researchers and practitioners study these three fractions of technology as part of innovation (Littunen, 2010; Naude et al., 2014; Chohan et al., 2015). Some even coined these ideas as technological innovation. Technological innovations refer to the new rules and ideas with practicality and/or commercialized by entrepreneurs (Naude & Szirmai, 2013). As documented in the OECD report (1991), technological innovation derived from the idea of 'innovation' which is a process initiated by the perception of new market and/or new service opportunity for a technology-based invention; which leads to development, production, and marketing tasks striving for the commercial success of the invention (refer Garcia & Calantone, 2002).

Despite the varying perspectives for 'innovativeness', researchers also started to re-working on innovation success and failure (Saad & Mazzarol, 2010). A number of literature from 2002 until now are looking for successful innovation and its predictors (Huang, Soutar & Brown, 2002; Allard, Riel, Lemmink, & Ouwersloot, 2004; Prajogo & Ahmed, 2006) for current business setting even the concept is already studied since 1982. Thus, current studies are shifting attention from evaluating successful innovation in terms of tangible result (asset, profit, financial position, etc.) to a more comprehensive picture which covers firms' growth (Littunen, 2010; Saad & Mazzarol, 2010), survivality (Ramayah et. al., 2005; Littunen, 2010), customers loyalty and satisfaction (Ganiyu, Uche & Elizabeth, 2012).

Over the years, SME Success is a wide term used to describe the business performance regardless of financial measurement or non-financial measurement. Most of previous literatures focus on financial measurement as the key to evaluate business success. However, this evaluation is considered biased by scholars who believe non-financial measurements are also important to be assessed as SME Success. In addition, SME performance is widely accepted

to assess business well being from two main aspects from financial performance and product market performance (Lee et. al., 2012; Ozer & Tinaztepe, 2014) but for SME category the performance nowadays are the second priority they need to concentrate if the business cannot sustain operation (Beaver & Jennings, 2005; Reiss, 2006). Ahmad & Seet (2009) reported that the failure rate is alarmingly high for the first five years for SME at 60 per cent. Hence, survival is more critical to SME compared to the efforts to improve their performance. According to Eurostat-OECD Manual (2008), the survival of an enterprise is defined in the following way: An enterprise born in year xx or having survived to year xx from a previous year is considered to have survived in year xx+1. If it is active in terms of turnover and/or employment in any part of year xx+1, then it is said as survived business. Further, Longenecker, Moore, Petty, & Palich (2010) concluded that in small and privately-held business, data of sales and profits is often not available. Thus, number of employees or employee growth has been used as a proxy for business survival.

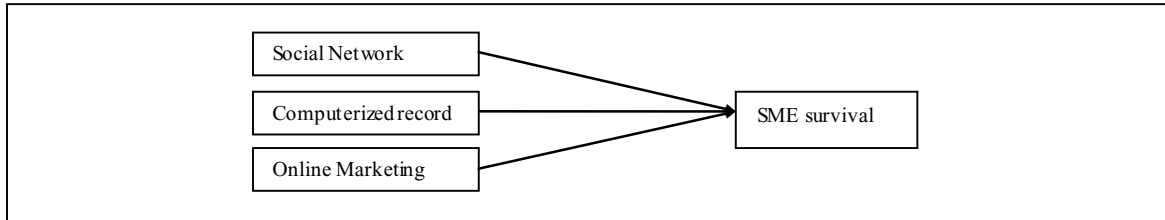
Apart the discoveries of the technological innovations' impact on SME, different countries may have different results. As in under developed countries, the promising world of globalization alone cannot be satisfied by the firms due to lack of financial funding, then the innovation is no longer perceived as ways to improved business performance. In contrary, for the developing and developed countries, business sustainability through technological innovation either from social networking context, computerized record or online marketing can be achieved therefore the firm's survivability can be secured. With the rapid changing world of internet and its impact to the SME, the fight to sustain business is more crucial than business growth and profitability. Once business survival rate is improved, then business performance will be easily maintained rather than focusing on business growth but the core issue in business cycle to progress is neglected. Below is the summary of selected literature on SME studies related to this paper's area of discussion.

Table 1. Summary of selected literature.

Research title	Authors	Variables	Methodology & Findings	Limitations
1. Determinants of entrepreneurial success/failure from SMEs perspective	Shafique, M. R., Rizwan, M., Jahangir, M. M., Mansoor, A., Akram, S. & Hussain, A. (2013)	- Financial management and accounts management; Marketing management; Production and operation management; Human resource management	- Qualitative study. - Variables stated are proved to be significant from literature review.	- This study is a conceptual paper with no empirical data. - The definition of business success/failure is not specifically stated.
2. The Determinants of SME Succession in Malaysia, From Entrepreneurship Perspective	Gan, C. K. & Almsafir, M. K. (2013)	-Managing skills in finance; Social networking; Creativity of business products or services; Level of education of entrepreneur	- Quantitative study. - 386 respondents in Malaysia (Questionnaires) - Individual determinants such as manage finance skills, manage social skills, and manage own creativity into business is more important than environmental factors such as government support or political involvement.	- The respondents are centralized in Klang Valley and the methodology used (snowball method) is not suitable to generalization. - The variables are too wide and broad in SME context.
3. The Social Media and Entrepreneurship Growth	Jagongo, A. & Kinyua, C. (2013)	Market access; Customer Relationship Management; Innovativeness; Price of product	- Quantitative study. - 246 SMEs in Nairobi (Questionnaires) - Social media tools provide greater market access and CRM which have a significant impact on the growth of SMEs.	- This study suggested that social media had impact towards SME growth but the measurement of growth is ambiguous.

4. Preliminary Qualitative Findings on Technology Adoption of Malaysian SMEs	Abdullah, N. H., Shamsudin, A., Wahab, E. & Hamid, N. A. (2012)	Internal factors are divided into two: SME owner’s characteristics and organizational characteristics; External factors: Government policy, environment, networking, etc.	- Exploratory study. - Interview two companies in Malaysia. - Internal factors: SME’s owner manager’s characteristics have significant influence on technology adoption among SMEs.	- Discussion from Theory of Reasoned Action (TRA) to Technology Adoption Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) are not tested in the study. - Business survival is achieved through technology but less attention is given to highlight the way it helps SME.
5. The influence of network effects on SME performance	Naude, P., Zaefarian, G., Tavani, Z. N., Neghavi, S. & Zaefarian, R. (2014)	CEOs' managerial style: Emotional intelligence & Entrepreneurial style; Network structure: structural holes and degrees of centrality	- Quantitative study. - 227 CEO of SME in Iran (Questionnaires) - Entrepreneurial style does not influence external networking behavior.	- The influence of network impact is tested on SME performance but it comes after business survives/failure stage in Business Life Cycle. So, the effect should also be tested from initial stage which is the Business Survival/Failure stage.

3. Theoretical framework



Sources: Mytelka & Farinelli, 2000; Beke, 2010; Lee et. al., 2012; Padachi, 2012; Jagongo & Kinyua 2013; Nobre & Silva, 2014; Naude et. al., 2014; Choban et. al., 2015

Fig. 1. Theoretical framework.

Technological innovation refers to the process by which firms master and implements the design and production of products/services that are new to the business irrespective of whether the products/services are new to their competitors or their customers or the world (Mytelka & Farinelli, 2000). In this study, social networking, computerized record and online marketing are categorized under technological innovation as described in Literature Review section.

3.1 Social Networking - Research shows that SMEs using the Internet to conduct business have higher revenues (Jagongo & Kinyua 2013; Nobre & Silva, 2014). Social networks are no longer been placed as communication medium for individuals. However, with the vast technological advancements these days, SME needs to adopt social networking as their source of communication channel (Choban et. al., 2015; Naude et. al., 2015) on top of acting as the marketing tool (Nobre & Silva, 2014) for business growth. Social networking has led to the beginning of social media marketing and presented ways of communication to expand targeted customer on various Internet platforms (Choban et al., 2015). On the other hand, there are also research findings that do not support the establishment of innovation in business lead to SME growth (Jagongo & Kinyua 2013). Theoretically, that is the reason that social networking does not only significant in assisting business to improve business performance, growth and profitability

but it should also facilitate in terms of business survivability. In this study, social networking is defined as bounded groups of individuals, organizations, communities or societies are linked, where members interact, discuss and exchange knowledge via online applications (Vásquez & Escamilla, 2014). Therefore, hypothesis for this variable suggests that there is a relationship between social networking and SME survival as the more SME owners utilize social networking, the better survival rate for business can be achieved.

H1: Social networking is positively related to SME Survival

3.2 Computerized Record – Recent studies are promoting the use of computerized record as part from accounting system to have an improved process flow, reduced inventories incorrect, better data analysis and better customer service as well as improved profit margins (Fan & Fang, 2006 as cited in Jagongo & Kinyua 2013). In advance, lack of organizational preparation of SME (Motwani, Mirchandani, Mandal & Gunasekaran, 2002) and resource scarcity (Beke, 2010; Padachi, 2012) is the main discussed factor that make computerized record is difficult to be implemented in business. Although computerized record had shown significant benefits for business, SME is still sceptical to use accounting software for computerized record keeping (Chong, 2012). In this study, computerized record refers to the financial records, for example the sales (sales journal), purchasing transactions (purchases journal), cash or cheque payments book, petty cash book and any other assets management using computer or digital technology (Maseko & Manyani, 2011). Given that, documents and records are based on computerized system, more quality decision making (Beke, 2010) can be achieved through easy access to the business information. As a result, hypothesis for computerized record proposes that SME Survival can be improved if SME implement computerized record in business operation.

H2: Computerized record is positively related to SME Survival

3.3 Online Marketing – According to SME Masterplan 2012-2020, there are six main key challenges which includes Human Capital Development, Access to Financing, Market Access, Legal and Regulatory Environment, Infrastructure, as well as Innovation and Technology Adoption. The last one reported as the most significant performance lever with the highest result on total productivity and employment growth (SMEE Corp, 2011b). Low commercialization set with low awareness on research and development activity (Lee et. al. 2013) suggested as one of the impactful key challenges under Innovation and Technology Adoption for SME. This is as a result from SME perception on technology that assumed innovation is costly and do not take this as an investment opportunity which leads them to be outdated and not relevant to be competed in current market (National Survey on R&D, 2008). In this study, online marketing refers to the use of digital and information technology to fulfill traditional marketing practices (Kilmartin, 2013). Overall, hypothesis for this variable recommends that the more SME owner engage in online marketing, the more chances for business to secure SME survival.

H3: Online marketing is positively related to SME Survival

4. Methodology

The methodology used for this paper consists of library search and evaluate previous literature review on the subject of SME Survival and Technological Innovation. The library search encompasses from online and offline materials to article journals and chapter in a book. References are based on online databases such as Web of Science, Scopus, Science Direct and Google Scholar. The advance search is limited to SME, Innovation, Technology, Survival and small business. References are only taken from article from journal, chapter from a book and full text document. Thus, limitations from this paper could be due to limited resources from databases as mentioned earlier as the search results are also excluded Sciences, Education and Health studies related to technological innovation impact towards business. Also, the SME references are not restricted to Malaysian SME but also taking into consideration worldwide SME progress from 2000 until now, 2015.

5. Conclusion

This paper has successfully developed a theoretical framework that is helpful for future research in this area. Besides, this study has provided new insight view on SME studies and shift the development of business research from looking at the performance and success factors to different angle which is identifying factors to improve the SME survival. The understanding of SME survival significance may lead to the effort in promoting technological

innovation in business. Theoretically, social networking, computerized record and online marketing are the main variables that found to be significant to SME survival but empirical data is required to prove these connections. Nevertheless, as this is a conceptual paper, there is no data collected to enable generalization to other countries. On top of that, the framework in this study is self-constructed with reference to the previous literatures. Therefore, generalization is not suitable to be applied. Further, the same study is encouraged to be done in other countries and using different technological innovation drive. Therefore, by improving the use of technological innovation, SME survival can be expanded for the business to grow and flourish.

Acknowledgements

The work presented in this paper has been funded by Research University Grant, Universiti Sains Malaysia, (1001/PJJAUH/816235).

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