

Sustainable Competitive Advantage through Information Technology Competence: Resource-Based View on Small and Medium Enterprises

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Abstract

Information and communication technology (ICT) has been the main focused of Malaysian government to strengthen the small and medium enterprises (SMEs) in the country. However, scholars in resource-based view acknowledge that sustainable competitive advantage can only be achieved through building a co-specialised ICT competence between the human factors and ICT facilities in the firm. In the context of SMEs, the entrepreneur is expected to become the agent for the integration. In order to do so, the entrepreneur must be equated with sufficient ICT knowledge. This knowledge can be acquired through either education or experience. The framework developed is then tested through 365 sets of primary data collected from the entrepreneurs in SMEs in Malaysia. SPSS version 15 is used to analyse the data. The results of statistical analysis have supported the framework proposed. Managerial implications and conclusion are then discussed.

Keywords: ICT competence, resource-based view, SMEs

1. Introduction

Economy of Malaysia is made up of 546,218 establishments of the Small and Medium Enterprises (SMEs), which accounted for 99.2% of total businesses in Malaysia [2]. These SMEs have contributed 56.4 per cent of employment [2], RM88,266 million worth of output, and RM17,798 million worth of value added to the Malaysian economy [26]. However, the employee productivity of SMEs is only RM14,740 compare with large enterprises of RM47,830 per employee [2]. Therefore, efforts to enhance the productivity and thus competitiveness of SMEs in Malaysia are very much needed. One of the possible solutions to this issue might be the usage of information and communication technology (ICT) which would be embedded in the company wide operation.

The government of Malaysia is playing a very active role in encouraging the adoption of ICT among SMEs in the country [8, 42]. The main purpose is to accelerate the competitiveness of the businesses in particular and sustainable Malaysian economy as a whole [8, 42]. In the Ninth Malaysian Plan which takes effect from 2006 to 2010, various funds have been made available to the development of ICT, especially among the SMEs (Ninth Malaysian Plan, 2006). This is because the impact of ICT on the competitiveness of Malaysia is huge in this increasing globalise world to achieve Vision 2020 [47]. However, introduction of ICT also demanded the businesses to be more competitive since the convenience of internet has opened more options for the consumers to search for the best and cheapest products virtually from anywhere in the world [47]. Thus, in order stay competitive, firms have to continually upgrade the quality of products and adopt the cheapest methods of production [47]. Global

challenges also provided the opportunity for SMEs to participate in international supply chain, provided that they able to adapt to new technology, especially ICT [15].

Although ICT can no doubt improve the effectiveness and efficiency of a firm if properly utilise, analyses from the perspective of resource-based view are doubtful on the potential of ICT in generating sustainable competitive advantage of the firm [3, 32, 44] due to tradability of ICT hardware and software in the market [3]. According to Bharadwaj [5], ICT infrastructure that is complex, hard to understand, and hard to imitate can have direct impact on sustainable competitive advantage of the firm. However, scarce of resources and capability in SMEs [1, 12] might have limited their ability in constructing this information technology infrastructure. Barney [3], Chatfield and Bjørn-Andreson [7], Mata, Fuerst, and Barney [22] and Ross, Beath, and Goodhue [38], on the other hand, have theoretically and empirically highlighted the important of human capital in generation of sustainable competitive advantage for the firm through ICT. Again, limitation in term of resources and capabilities might against the SMEs to employ highly information technology literate professional who can involve in making strategic decision for the firm. With existing literature knowledge, the question on how SMEs can be benefited from ICT to generate sustainable competitive advantage remains unanswered. In view of this, this study aims to uncover the sources of sustainable competitive advantage for small and medium enterprises through information technology.

Next section in this paper will focused on reviews of previous literatures in the area of interest of this study. From the review of literatures, a framework will be constructed to associate the ICT and sustainable competitive advantage in small

and medium enterprises. Finally, managerial implications and suggestions for future research are discussed.

2. Literature Review

2.1. Resource-Based View and Competitive Advantage

Resource-based view is originated from the seminar work of Penrose [31] in 1959 and 1960 [14, 17, 18, 19, 20, 39, 40, 48]. Wernerfelt's [48] paper in 1984 has set the cornerstone for the research interest in strategic management to be shifted back to the internal of the firm from the industry [14]. In line with the major theories in strategic management, resource-based view is a theory of sustainable competitive advantage and a theory of rent [34]. The main theory of resource-based view could be well explained from the two frameworks that developed by Barney and Peteraf [34], which have been described as authoritative summary of resource-based view by Foss and Knudsen [11]).

According to Barney [3], valuable, rare, imperfectly imitable, and imperfectly substitutable resources could generate sustainable competitive advantage for the firm with the pre-requisite of heterogeneity and imperfectly mobile of resources among competing firms. Building on Barney [3] work, Peteraf [33] has focused on heterogeneity, ex post limits to competition, imperfectly mobile, and ex ante limits to competition as the characteristic for strategic resources in generation of sustainable competitive advantage for the firm.

The term "competitive advantage" has been popularised by Michael Porter [16] way before the construct of Barney's [3] and Peteraf's [33] frameworks. The idea of competitive advantage is mainly to measure firm's success relative to competitors [35, 36]. The relative success could be measured by "economic value" that firm able to generate [34]. This economic value refers to differences between perceived benefits of purchasers and economic cost of enterprise through provision of goods and services [34]. Since competitive advantage is focusing on explaining relative success of the firm, thus, firm does not need to be the best player in the industry in order to achieve competitive advantage [34].

In line with the idea of Porter [35, 36], competitive advantage in the context of resource-based view can be achieved through lower cost or differentiation advantage [34, 35, 36]. Lower cost is resulting from efficiency of firm in producing goods or services, matches with near to the market

competitive rate of pricing, then the lower cost can be transferred into superior return [34, 35, 36] while differentiation advantage is where a firm produced unique or superior value goods or services which command premium price in the market, matches with competitive cost of production then premium price can be transferred into superior return [34, 35, 36].

Undeniable, SMEs have not been the focus of theories in strategic management in explaining competitive advantage [28]. In fact, theories like five forces theory by Porter [36] are obviously not in favour for SMEs to gain competitive advantage (Wicks, 2005). However, some researchers have explored the competitive advantage for small and medium enterprises [e.g. 6, 10, 13, 28, 46]. In addition, competitive advantage concerns on comparative advantage rather than absolute advantage [34, 35, 36]. Thus, it is not logic to assume that SMEs cannot gain competitive advantage.

2.2 Information Technology Competence

Information technology has received significance research attention since last decade [27]. From mid-1980s onwards, information technology started to make strategic impact [4]. Following the trend, researchers started to focus on integration between information technology professionals and business managers in generating information technology capability and effective utilisation [e.g. 4, 37]. Majority of the researchers in resource-based view suggested the integration of human factor with information technology in generating sustainable competitive advantage [e.g. 3, 7, 22, 38], the discussion here would be focusing on the information technology competence of the management personnel in the firm.

In order to be the agent in integrating the information technology with the organisation effectively, individual must possessed sufficient information technology competence. However, knowledge alone is obviously insufficient. Tippins and Sohi [44] proposed that information technology competence must made up of three components; knowledge, operations, and objects in an organisation. Applying to the individual level, an effective agent must be knowledgeable in information technology, willing to utilise information technology in daily operations, and provided with information technology facilities and supports. These co-specialised resources will be indicated in term of the ability to understand and utilise the information technology for the benefit of the firm [44].

Information technology knowledge refers to the extent of technical knowledge about objects such as computer based systems [44]. This knowledge is able to convert into competence when it is utilised or exploited [4]. Information technology operations indicate the utilisation of information technology in daily operations of the firm [44]. However, information technology knowledge and information technology operations can only exist if the firm does prepare a platform for information technology. Therefore, information technology objects refer to availability of hardware, software, and personnel to support the performance of information technology operations [44]. Possession of information technology knowledge, information technology operations and information technology objects are indicating firm ability to acquire, deploy, and leverage information technology functionality in combination or co-presence with other resources to shape and support business processes in value adding ways [5, 30, 41].

Some researchers have included experience and education in information technology as part of information technology competence as well [e.g. 4, 37]. According to Bassellier et al. [4], experience in information technology refers to the activities taking place in a particular organisational which includes experience in information technology projects and experience in the management of information technology. However, this study argues that experience and education in information technology can have impact on information technology competence of individual rather than can be viewed as part of information technology competence as indicated by Bassellier et al. [4]. In line with Ucbasaran, Wright, and Westhead [45] argument, experience will provide skills, competencies and resources for the future. Thus, experience in information technology is expected to supply knowledge in information technology, to make individual more willing to utilise information technology, and more willing to invest in information technology facilities. Naqvi [24, 25] discussion on the best practice in information technology education to build information technology competence among the students has indirectly indicated that the education in information technology is one of the pre-requisite for information technology competence of an individual.

2.3 Information Technology Competence and Competitive Advantage of the Firm

Following the frameworks in resource-based view, in order to achieve sustainable competitive advantage, firm must possessed resource that is valuable, rare, imperfectly imitable, and imperfectly substitutable [3] or heterogeneity,

imperfectly mobile, ex ante limits to competition, and ex post limits to competition [33]. Therefore, scholars in resource-based view do not generally agreed that information technology alone can yield sustainable competitive advantage for the firm [e.g. 29,43]. The main issue is due to the easily available of information technology hardware and software in the market place [3]. Even, Bharadwaj [5] has mentioned that sustainable competitive advantage can be achieved through the information technology facilities since these facilities are normally made up of complex, hard to understand, and hard to imitate set of components, his argument seemed to have neglected the issue on valuable. The logic here is simple, even a firm owned most sophisticated information technology facilities which are impossible for the competitors to imitate or substitute, and for sure it is rare, but if there is no knowledgeable personnel in the organisation, or the knowledgeable personnel in the organisation is not willing to utilise these facilities, these facilities would not be generating any value to the organisation. Obviously, to achieve sustainable competitive advantage, knowledge, willingness to use (operations), and availability of facilities must co-exists.

Previous theoretical and empirical analyses have shown consistent results on the impact of integration between information technology competence and sustainable competitive advantage of the firm. In Mata et al. [22] theoretical analysis of sources of competitive advantage through information technology using resource-based framework [3], they suggested that only managerial information technology skills can potentially generate sustainable competitive advantage for the firm. Parallel to Mata et al. [22], Powell and Dent-Micallef [32] among human resources, business resources, and technology resources, only complementary of human resources on information technology was found to be significantly positive association with information technology performance, overall performance, profitability, and sales growth. Tippins and Sohi [44], on the other hand, have found that organisational learning intervene the association between firm's information technology competence and performance.

Reviews of literatures and logical analysis have confirmed that firm is able to achieve sustainable competitive advantage through integration of knowledge, utilisation, and objects in information technology. This integration would create valuable and rare resources for the firm since not all firms are able to enjoy the efficiency and effectiveness brought by ICT. Since the integration might be causal ambiguity which is hardly understandable [3, 9], it is hardly imitate by the

competitors. Although competitors might be able to substitute co-specialised set of information technology competence with similar information technology applications or other applications, the substitution would not mean it is impossible for firm to yield sustainable competitive advantage [3].

3. Application in SMEs

In early part of the discussion, the problem of scarce resources and capabilities in SMEs has been highlighted. Therefore, it is very unlikely for most of the entrepreneurs to employ managers who are proficient in information technology to be the key decision makers unless the core business of the SME is in ICT field. This is because majority of the SMEs in Malaysia are in the category of micro and small [15]. In fact, if the SMEs are able to employ the information technology literate graduate, the knowledge in information technology from this employee is insufficient since the information technology competence required key decision to be made investment on the ICT facilities and usage of ICT in the firm operations.

A closer view on previous literature works on SMEs suggested that SMEs are highly personalised to the style of the owner or entrepreneur [12]. Scarce of resources in SMEs [1, 12] has forced the function of the firm to be relied on a single individual or a small management team [16]. Therefore, entrepreneur of the firm is expected to be the agent to integrate the information technology into the firm to generate sustainable competitive advantage to the SMEs. In order to do this, the entrepreneur must need to possess sufficient knowledge in information technology, utilise the information technology in daily firm operations, and invest in information technology facilities. These information technology competencies could be gained from having education or experience in information technology. Thus, the following framework is proposed.

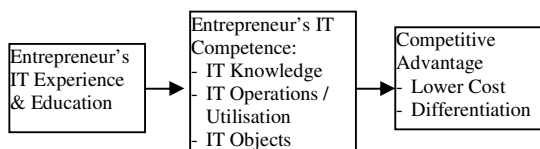


Figure 1: Proposed framework

The framework starts with education and experience of the entrepreneur in the area of information technology. This education and experience in information technology will provide the technical knowledge in information technology. Apart from that, experience and education in information technology would also encourage and provide the capability to the entrepreneur to utilise

information technology in firm operations and strategic planning. The awareness on the potential benefits of information technology would encourage the adoption of information technology in the firm through investment in information technology facilities. Therefore the following hypothesis is formulated:

Hypothesis 1: Information technology experience and education of the entrepreneurs have significance impact on the information technology competence of entrepreneurs.

Combination of information technology knowledge of the entrepreneur, willingness to utilise information technology for firm's operations and strategic, as well as willingness to invest in information technology facilities are able create a set of co-specialised resources. This co-specialised set of information technology competence is able to create resource that is valuable, rare, imperfectly imitate, and imperfectly substitute [3]. Thus, this will enable firm to enjoy sustainable competitive advantage in the long run. Therefore, the following hypothesis is constructed:

Hypothesis 2: Information technology competence of the entrepreneur will be able to yield sustainable competitive advantage to SMEs.

4. Instrument Development

In order to provide the empirical evident to support the framework developed, a questionnaire is developed to collect the primary data from the entrepreneurs in SMEs. The questionnaire on information technology competence that is information technology knowledge, information technology operations, and information technology objects, is adapted from Tippins and Sohi [44] study. Amendments were made to suit the focus of this study. For the information technology education and experience as well as competitive advantage of the firm, the questionnaire is self-developed by referring to previous literature study. Information technology education is measured by information technology formal education, information technology course attended, and information technology professional certification obtained while information technology experience can be measured through information technology working experience, information technology project experience, and information technology business venture experience. Instrument for competitive advantage is developed according to Porter [35, 36], McGrath, Tsai, Venkataraman, and MacMillan[23], and Peteraf and Barney [34] discussion on competitive advantage. Therefore,

competitive advantage is divided according to cost advantage and differentiation advantage.

5. Research Design

Data for this study is collected from SMEs in Malaysia through various methods during May 2007 to July 2007. First, census study is conducted on Malaysian owned ICT SME in Multimedia Development Corporation Sdn. Bhd. (MDeC) database. Total of 2572 personal emails were sent to the respondents, in which 1575 have successfully reached the targeted respondent and yield 152 usable responses that is around 10 percent of effective response rate. In addition to that, SMEs participated in trade exhibitions and located in around Klang Valley were targeted. Additional 204 sets of usable responses, which represent around 40 percent of response rate were collected which increase the total number of responses to 365 sets.

SPSS version 15 is used to analyse the data collected. For the first hypothesis, independent sample t-test is used to analyse the significance of entrepreneurs' education and experience in information technology on their information technology competence. This is because information technology education and experience are measured using nominal scale while information technology competences are measured by ordinary-interval scale. For the second hypothesis, multiple-regression is used to analyse the effect of entrepreneurs' information technology competence on competitive advantage of the firm. Since both information technology competence and competitive advantage are measured by ordinary-interval scale, it allows the used of multiple-regression.

6. Data Analyses and Findings:

Tables below summaries the results of statistical findings for the framework developed in this study.

Table 1: Independent sample t-test for effect of IT education and IT experience on IT competence

| | IT Knowledge | | IT Operations | | IT Objects | |
|-----------------------|--------------|------|---------------|------|------------|------|
| | T | sig. | t | sig. | t | sig. |
| IT Education | | | | | | |
| IT Formal Education | 8.09 | 0.00 | 5.07 | 0.00 | 4.54 | 0.00 |
| IT Course Attended | 9.99 | 0.00 | 7.57 | 0.00 | 6.31 | 0.00 |
| IT Professional Cert. | 8.92 | 0.00 | 6.07 | 0.00 | 6.10 | 0.00 |
| | | | | | | |
| IT Experience | | | | | | |
| IT Working Experience | 10.9 | 0.00 | 7.67 | 0.00 | 7.25 | 0.00 |
| IT Project Experience | 10.9 | 0.00 | 7.86 | 0.00 | 7.39 | 0.00 |
| IT Business Venture | 10.3 | 0.00 | 7.67 | 0.00 | 7.32 | 0.00 |

Table 1 shows the results of independent sample t-test for the significance of information technology education and information technology experience in affecting the information technology competence of the entrepreneurs. From the analyses, all the variables measuring information technology education and information technology experience are found to have significant and positive effect on information technology knowledge, information technology operations, and information technology objects. These results indicate that entrepreneurs with information technology education and information technology experience are significantly more knowledgeable, more willing to use information technology in firm operations, and more willing to invest in information technology facilities in the firm. Therefore, these findings have supported the first hypothesis.

Table 2: Multiple regression for information technology competence on competitive advantage of the firm

| | Cost Advantage | | Differentiation Advantage | |
|----------------------|----------------|------------------|---------------------------|------------------|
| | R ² | F | R ² | F |
| IT Competence | | | | |
| IT Knowledge | 0.15 | 21.118 (0.00) | 0.11 | 14.027 (0.00) |
| IT Operations | | | | |
| IT Objects | | | | |

Results of multiple-regression as shown in table 2 supported that the co-specialised set of resources through integration of information technology knowledge of the entrepreneurs, usage of information in operations of the firm, and availability of information technology facilities in SME can have significance effect on competitive advantage of the firm. This co-specialised information technology competence in the firm can significantly explain 15 percent of variability in cost advantage and 11 percent of variability in differentiation advantage. Therefore, these findings supported the second hypothesis in this study that is information technology competence of the entrepreneurs can significantly contribute to the competitive advantage of SMEs.

Statistical analyses above have provided the empirical evidences to support the framework proposed for this study. The results in the study are in line with previous literatures suggesting the important of human factors in generating sustainable competitive advantage [3, 7,22, 38]. On top of that, this study has extended the knowledge into the application of SMEs and confirmed that entrepreneurs with sufficient knowledge in information technology can act as the agent to integrate information technology into the daily operations of the firm with the support of information technology facilities.

7. Managerial Implications

From theorising of the framework above, various implications can be directed to policy makers, higher learning institution, and the entrepreneurs. The main direction is to assist the SMEs to gain sustainable competitive advantage through information technology and uplift SMEs in Malaysia to face the challenge of globalisation and fully capture the opportunity in global market.

For the policy makers, this study would recommend them to restructure their assistance programme in assisting the SMEs to adopt information technology. The assistance programme should not be only focusing on funding the purchase of information technology hardware and software alone. The assistance programme should be extended to assist the entrepreneurs to gain information technology knowledge and directing them to utilise information technology in firm operations and strategic planning. This will ensure that the information technology facilities invested by SMEs can be fully utilised to achieve competitive advantage of the firm. This can be achieved through providing courses on information technology to the entrepreneurs who applied for the assistance from the policy makers. In addition,

since introduction of ICT also represent challenges to the SMEs beside opportunities [47], the assistance programme from the policy makers might be extended in order to ensure the entrepreneurs in SMEs would not facing any competitive disadvantages due to the impact of ICT.

In view of the challenges and opportunities presented by ICT on SMEs in Malaysia, higher learning institutions would have an important role to play in strengthening future SMEs in the country. This study suggests that higher information technology materials should be inserted into the syllabus of non-information technology courses in the higher learning institution, especially in the entrepreneurship or business courses in general. This would benefit the students when they venture into entrepreneurship career in the future. In addition, the proficiency in ICT would also improve the chances for these entrepreneurship or business field graduates to venture their business into ICT related industry. This would definitely benefited the country since various efforts have been done by the government to encourage the development of ICT in the nation such as Multimedia Super Corridor (MSC), formulation of Ministry of Science, Technology, and Innovation (MOSTI), and Multimedia Development Corporation Sdn. Bhd. (MDeC). Thus, increasing the elements of ICT in the syllabus of higher learning institutions would be seemed as a good move to support the policy of the government in encouraging the development of ICT in the nation especially in term of ICT SMEs.

For existing entrepreneurs or want-to-be entrepreneurs, this study could be prepared for them to strengthen their information technology knowledge, to utilise ICT in daily operations of the firm and in making strategic decision for the firm, and to equip firm with ICT elements since theoretically, these elements would create strategic resources for firms to gain sustainable competitive advantage. This is important even to the SMEs in the industry that is not traditionally required high ICT elements due to increase in global challenge and increase in consumers choice and awareness have changed the landscape of competition in business world. Besides that, the entrepreneurs should also be more alert to the assistance programme provided by the government in assisting them to adopt the ICT in their firm. However, due to various limitations, SMEs might not want to utilise ICT for the strategic purpose [27]. This study advice the SMEs to at least adopt minimum level of ICT since ICT has already developed to be part of competitive requirement in the business world today.

8. Conclusion

SMEs are the backbone for economic development in Malaysia. However, SMEs in Malaysia is obviously lacking of productivity compare to their larger counterpart. In addition, increase liberalisation of the world economy and the impact of ICT on consumer behaviour have demanded SMEs to improve their competitiveness. ICT would be seemed as a good solution to all these problems. However, scholars in resource-based view have against the idea that ICT hardware and software would be able to provide firm with sustainable competitive advantage. According to them, sustainable competitive advantage from ICT is only able to achieve through integration of ICT with human factors in the firm. This integration would provide a set of strategic resource to achieve sustainable competitive advantage for the firm.

In the context of small and medium enterprises, lack of resources and unlikely to higher highly capable human resource mean the entrepreneur must bear the responsibility to be the agent to integrate ICT with the firm. Thus, entrepreneurs in SMEs must acquire certain level of ICT competence through education or experience in ICT. This would help them to achieve sustainable competitive advantage for their firms.

From the construct of framework of sustainable competitive advantage through ICT in SMEs, this study has highlighted various recommendations to policy makers, higher learning institutions, and the entrepreneurs as well. However, users of this framework should beware that ICT is a field that evolve at a very fast rate. This evolution might make the existing knowledge and facilities in ICT become obsolete. Thus entrepreneurs should always update their ICT competence through continuously enrol in training and experience on latest ICT development to ensure continuously renewal of their ICT competence and thus sustain the competitive advantage of the firm.

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References:

[1] Aragón-Sánchez, A. and Sánchez-Marín, G.. "Strategic Orientation, Management Characteristics, and Performance: A Study of Spanish SMEs."

Journal of Small Business Management (43:3), 2005, pp. 287-308.

[2] Bank Negara Malaysia. *Annual Report 2006*. Kuala Lumpur: Author, March, 2007.

[3] Barney, J. B. "Firm Resources and Sustained Competitive Advantage." *Journal of Management*, (17:1), 1991, pp. 99-120.

[4] Bassellier, G., Benbasat, I., and Reich, B. H. "The Influence of Business Managers' IT Competence on Championing IT." *Information Systems Research*, (14:4), 2003, pp. 317-336.

[5] Bharadwaj, A. S. "A Resource-Based Perspective on Information Technology Capability and Firm Performance: An Empirical Investigation." *MIS Quarterly* (24:1), 2000, pp. 166-196.

[6] Brendle, M. G. *Personality and Company Culture: Important Contributions to Innovation and a Source of Competitive Advantage in Small Businesses*. Doctorate Dissertation: Clemson University, 2001.

[7] Chatfield, A. T. and Bjørn-Anderson, N. "The Impact of IOS-Enabled Business Process Change on Business Outcomes: Transformation of the Value Chain of Japanese Airlines." *Journal of Management Information System* (14:1), 1997, pp. 13-40.

[8] Chong, Y. W. *Technology as a 'Business Accelerator' in SME Technology Capacity Building in Malaysia*. 2007, National Workshop on SIS, Jakarta.

[9] Dierickx, I. and Cool, K. "Asset Stock Accumulation and Sustainability of Competitive Advantage." *Management Science* (35:12), 1989, pp. 1504-1511.

[10] Fiegenbaum, A. and Karnani, A. "Output Flexibility – A Competitive Advantage for Small Firms." *Strategic Management Journal* (12:2), 1991, pp. 101-114.

[11] Foss, N. J., and Knudsen, T. (2000). "The Resource-Based Tangle: Towards a Sustainable Explanation of Competitive Advantage." *Management and Decision Economics* (24:4), 2000, pp. 291-307.

[12] Hashim, Mohd Khairuddin and Wafa, Syed Azizi (2003). *Small and Medium Enterprises in Malaysia: Development Issue*. Selangor: Prentice-Hall, 1963.

- [13] Harris, S. A. *Advertising and Sustainable Competitive Advantage in Small Firm*. Doctorate Dissertation: Michigan State University, 2000.
- [14] Hoskinsson, R. E., Hitt, M. A., Wan, W. P. and Yiu, D. "Theory and Research in Strategic Management: Swings of a Pendulum." *Journal of Management* (25:3), 1999, pp. 417-456.
- [15] Industrial Master Plan. *Third Industrial Master Plan, 2005-2020*. Putrajaya: Author, 2005.
- [16] Jones, O. "Competitive Advantage in SMEs: Towards a Conceptual Framework." In Tilley, F. and Tonge, J. (Eds.). *Competitive Advantage in SMEs: Organising for Innovation and Change*. England: John Wiley & Sons Ltd, 2003, pp. 15-33.
- [17] Kor, Y. Y. and Mahoney, J. T. "Penrose's Resource-Based Approach: The Process and Product of Research Creativity." *Journal of Management Studies* (37:1), 2000, pp. 109-139.
- [18] Kor, Y. Y. and Mahoney, J. T. "Edit Penrose's Contributions to the Resource-Based View of Strategic Management." *Journal of Management Studies* (41:1), 2004, pp. 183-191.
- [19] Lockett, A. "Edith Penrose's Legacy to the Resource-Based View." *Managerial and Decision Economics* (26), 2005, pp. 83-98.
- [20] Lockett, A. and Thompson, S. "Edith Penrose's Contributions to the Resource-Based View: An Alternative Perspective." *Journal of Management Studies* (14:1), 2004, pp. 193-203.
- [21] Marsden, A. and Forbes, C. "Strategic Management for Small and Medium-sized Enterprises (SMEs)." In Tilley, F. and Tonge, J. (Eds.). *Competitive Advantage in SMEs: Organising for Innovation and Change*. England: John Wiley & Sons Ltd, 2003, pp. 34-53.
- [22] Mata, F. J., Fuerst, W. L., and Barney, J. B. "Information Technology and Sustained Competitive Advantage: A Resource-Based Analysis." *MIS Quarterly* (19:4), 1995, pp. 494-505.
- [23] McGrath, R. G., Tsai, M., Venkataraman, S., and MacMillan, I. C. "Innovation, Competitive Advantage and Rent: A Model and Test." *Management Science* (42:3), 1996, pp. 389-403.
- [24] Naqvi, S. J. "An Information Systems Approach for Teaching Basic IT Skills used in Business." *Computer Education* (95), 2004, pp. 23-28.
- [25] Naqvi, S. J. "Introducing Information Systems Approach for Acquiring IT Competence Needed for Business Applications." *Journal of Information Systems Educations* (15:1), 2004, pp. 79-86.
- [26] National Productivity Council. *Productivity Report 2006*. Selangor: Author, May, 2007.
- [27] Ndubisi, N. O. and Kahraman, C. "Malaysian Women Entrepreneurs: Understanding the ICT Usage Behaviours and Drivers." *Journal of Enterprises Information Management* (18:6), 2005, pp. 721-739.
- [28] O'Donnell, A., Gilmore, A. Carson, D., and Cummins, D. "Competitive Advantage in Small and Medium-Sized Enterprises." *Journal of Strategic Marketing* (10), 2002, pp. 205-223.
- [29] Oh, W. and Pinsonneault, A. "On the Assessment of the Strategic Value of Information Technologies: Conceptual and Analytical Approach." *MIS Quarterly* (31:2), 2007, pp. 239-265.
- [30] Pavlou, R. A. and El Sawy, O. A. *From IT Competence to Competitive Advantage in Turbulent Environments: A Dynamic Capabilities Model*. Unpublished Manuscript: University of California, n.d.
- [31] Penrose, E. T. *The Theory of the Growth of the Firm*. Oxford University Press: Oxford, 1959.
- [32] Powell, T. C. and Dent-Micallef, A. "Information Technology as Competitive Advantage: The Role of Human, Business, and Technology Resources." *Strategic Management Journal* (18:5), 1997, pp. 375-405.
- [33] Peteraf, M. A. "The Cornerstones of Competitive Advantage: A Resource-Based View." *Strategic Management Journal* (14:3), 1993, pp. 179-191.
- [34] Peteraf, M. A., and Barney, J. B. "Unravelling the Resource-Based Tangle." *Managerial and Decision Economics* (24:4), 2003, pp. 309-323.
- [35] Porter, M. E. *Competitive Advantage*. New York: The Free Press, 1985.
- [36] Porter, M. E. *The Competitive Advantage of the Nation*. New York: Palgrave, 1998.
- [37] Rockart, J. F., Earl, M. J., and Ross, J. W. "Eight Imperatives for the New IT Organization." *Sloan Management Review* (38:1), 1996, pp. 43-55.

[38] Ross, J. W., Beath, C. M., and Goodhue, D. L. "Develop Long-Term Competitiveness through IT Assets." *Sloan Management Review* (39:1), 1996, pp. 31-45.

[39] Rugman, A. M. and Verbeke, A. "Edit Penrose's Contribution to the Resource-Based View of Strategic Management." *Strategic Management Journal* (23:8), 2002, pp. 769-780.

[40] Rugman, A. M. and Verbeke, A. "A Final Word on Edith Penrose." *Journal of Management Studies* (41:1), 2004, pp. 205-217.

[41] Sambamurthy, V., Bharadwaj, A. S., and Grover, V. "Shaping Agility through Digital Options: Reconceptualizing the role of IT in Contemporary Firms." *MIS Quarterly* (27:2), 2003, pp. 237-263.

[42] SMIDEC. SME Performance Report. Kuala Lumpur: Author, June, 2006.

[43] Soh, C. and Markus, M. L. "How IT Creates Business Value: A Process Theory Synthesis." Proceeding of 16th International Conference on Information System, 1995, pp. 29-41.

[44] Tippins, M. J. and Sohi, R. S. (2003). "IT Competency and Firm Performance: Is Organizational Learning a Missing Link?" *Strategic Management Journal* (24), pp. 745-761.

[45] UcBasaran, D. Wright, M., and Westhead, P. (2003b). "A Longitudinal Study of Habitual Entrepreneurs: Starters and Acquirers." *Entrepreneurship & Regional Development* (15), 2003, pp. 207-228.

[46] Watkin, D. G. "Toward a Competitive Advantage: A Focus Strategy for Small Retailers." *Journal of Small Business Management*, 1986, pp. 9-15.

[47] Wee, V. "Vision 2020 and Enhancing Competitiveness." Prime Leadership and Management Course (JUSA), Series 28 No. 2/2003, 2003, INTAN, Bukit Kiara.

[48] Wernerfelt, B. (1984). A Resource-Based View of the Firm. *Strategic Management Journal* (5:2), 1984, pp. 171.

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