

# Rejuvenating Motivations and Renewing Technology: A Quest for Electronic Endeavor among Malaysian SMEs

**Rosmini Omar**

*International Business School, Universiti Teknologi Malaysia  
Kuala Lumpur Malaysia*

**Dewi A.Sapuan**

*Faculty of Business Administration, Universiti Tun Abdul Razak  
Kuala Lumpur, Malaysia*

## **Abstract**

This paper examines whether Malaysian SMEs are more motivated to renew their existing technologies due to internal proclivity (*technological opportunism*) or after being pushed by their external environment (*institutional pressures*). The analysis involved two phases of both qualitative and quantitative techniques. It aims to better understand a much realistic track for management of new technologies among SMEs in Malaysia, compared to their counterparts in matured economies. Malaysian SMEs' ability to manage and utilize technology which in this case is *electronic endeavor* determines their survival in creating and sustaining wealth. The results of the interview strengthen the survey's findings. Unlike SMEs in developed nations which solely have internal motivations to sense and try new technologies, Malaysian SMEs are driven by their external environment.

**Keywords:** Small and medium enterprises, motivation, technological opportunism, electronic endeavor.

## **1. Introduction**

When evoking dimensions of small and medium enterprises (SMEs), literature resorts to metaphors, similes and analogies. Such group of enterprises are fast, and innovative as gazelles (Birch, 1979), vogue and beautiful in terms of strategic alliances (Friedman, 1988), the fittest in survival if based on the Darwinian analogies (Sadler-Smith, Hampson, Chaston and Badger, 2003), and sustainable when viewed from the population ecology perspectives (Daft, 2001). At their very root, SMEs, led by entrepreneurs are summarized as archetypal capitalists as they are intrinsically motivated to explore high- risk endeavors. However, how far could such a generalization apply across different settings?

The purpose of this paper is to revisit this issue through the lens of technology renewal and motivations. Issues of technology renewal, specifically the Internet technology have been positively linked with innovation and the precipitation of business survival (example: Lipsey, 1993; Andrus, 2000; Khalil, 2000). In the same fashion, in-depth researches (Srinivasan, Lilien, Rangaswamy, 2002; Kanter, 2001) evidenced that the entrepreneurs' internal proclivity was strongly linked with their behaviors of incorporating Internet applications into existing business processes. While the two frontiers of management of technology and motivations interweaved, the strand of SMEs research and practice appeared bare. Those in-depth works focused on multiple size firms. Thus, there is still eclipse in clarifying the behaviors and performance of SMEs in relations to technology renewal and motivations. Are they really gazelles and vogue when embracing the Internet technology? In another angle, the two previous works were done in a well-developed setting, namely, the United States.

Would the same finding hold in Malaysia, an emerging economy which continuously emphasizes the concept of “nurturing domestic industries”?

An exploration of the above issues may help to shed further meaningful interpretations of SMEs area of research and practice. Also, it may help to lace a much bigger collage of three associated areas: SMEs, management of technology and motivations. The remainder of this paper is divided into four parts. The next part examines literature in order to build up this paper’s conceptual framework. Consequently, the research design is described. The third part discusses the findings. The paper’s final part discusses the managerial implications of the findings.

## Literature Review

### a. Rejuvenating Motivation

*Motivation* reflects the whole psychological forces which direct a person’s behavior in an organization, a person’s level of effort, and a person’s level of persistence in the face of obstacles (Dunnette and Hough, 1990). The direction of a person’s behavior refers to the many possible behaviors that a person could engage in. Motivation arises from both intrinsic and extrinsic sources. *Internally* or *intrinsically motivated behavior* is behavior that is performed for its own sake. The source of motivation is actually performing the behavior, and motivation comes from doing the work itself. *Externally*, or *extrinsically motivated behavior* is behavior that is performed to acquire material, social rewards or to avoid punishment. The source of motivation is the consequences of the behavior, not the behavior itself. People can be intrinsically or extrinsically motivated, or both (Jones and George, 2003).

The domain of motivation was already rich with models describing individuals’ behaviors (example: Vroom, 1964; Alderfer, 1969; Maslow, 1954). While the generalizability of the individual’s motivation models increased and managed to provide useful insights, the realm of organizational motivation required further extensive work. How far can interpretations of individual’s motivation apply and transcend the boundary of organizational motivation, such as SMEs? An exploration of such issues may enrich this domain.

Consistent with this viewpoint, a profound research (Kanter, 2001) that investigated different characteristics between successful and failing ventures of firms trying to implement the Internet technology showed that innovative companies managed to adopt and diffuse the Internet technology because they first, changed the people’s attitude from resisting change to positively regarded change as crucial and positive. This was done through providing rewards, explaining the benefits of such technological change and encouragement for the employees to participate in the change programs. In a similar tone, all these activities reflected the source of extrinsic motivations. The firms’ strategy to shift the employees and managers’ paradigms sourced from motivation, materialized into renewal, and change of technology.

### b. Renewing Technology

Technology constituted all the knowledge (know-how and know-why), products, processes, tools, methods, and systems employed in the creation of goods or in providing services (Zeleny, 1986; Khalil, 2000). The ability of any technology to convert possibilities, potentials and ideas into realities made it an invaluable asset to a business enterprise. In fact in the 21<sup>st</sup> century, technology which resided in the organization’s people and systems was considered an added value, far more significant than the firm’s physical assets or its simple accounting worth (Khalil, 2000).

However, an inquiry is raised at this point: Could a business enterprise maintain its technological edge over time? Technology was argued as the main factor which led 60 to 80 percent of small businesses failed within five years of starting up. For such a similar reason, the top 100 companies on the Fortune 500 list in 1956 dwindled to only 29 in 1992 (Khalil, 2000). What was the reason behind this failure? In considering this question and the earlier one, some literature (Berman

and Khalil, 1992; Heim and Compton 1992; Chacko, 2004) manifested that technology itself shifted dynamically. Within the span of 200 years, technological innovations sprang from telephones during the Industrial Revolution era to microchips in the Information Economy. Such changes in technology not only impacted the production of new goods and services, but also the process of market capitalization, as well as survival of firms. Requiring for the needs to manage technology, organizations must have the will and motivation to agilely adapt to such technological shifts, in order to sustain. In sum, renewing existing technologies is crucial, and firms must continuously feel the drive to endeavor technological change.

*Technological opportunism* (Srinivasan, Lilien, Rangaswamy, 2002) was a framework based from the concern on the importance of technology renewal. The foundation of this work lies on the Internet technology. The concept rested on two constructs: 1) *technology sensing capability*; and 2) *technology response capability*.

*Technology sensing capability* referred to organizations' ability to acquire knowledge about, and understand new technology developments that may arise from internal or external innovations. *Technology response capability* basically meant organizations' willingness and ability to respond to new technologies they sensed in the environment that might potentially affect their existence. Srinivasan *et.al'* (2002) banked their argument on the awareness of firms' decision makers. When a decision maker perceived a strategic issue as an opportunity, they inferred such a situation as positive. The decision maker would also perceive great control over the outcome, and hence, took proactive actions. Technology development depicted a potential source of growth. A firm that has high *technology opportunism* would respond proactively and adopt the new technology radically. This new concept was found to be significant when tested against the adoption of electronic business, using a sample of 130 firms in the United States of America. The methodology consisted of a survey questionnaire and interviews.

In another setting, and via totally a different set of antecedents, Hu, Chau, and Sheng (2000) reestablished the link between organization's internal readiness and technology renewal. This particular study reapplied Tornatzky and Fleisher's model (1990) to investigate factors which affected healthcare organization's adoption of telemedicine technology in Hong Kong. The researchers developed three major constructs, namely 1) *technological readiness* (consisted of *perceived ease of use*, *perceived technology safety*, *perceived benefits* and *perceived risks*), 2) *organizational readiness* (the *collective attitude of medical staff*), 3) *the external environment (service needs)*. The study which was based on a survey managed to identify that collective attitude of medical staff and perceived service risks as significant factors in organizational adoption of telemedicine technology. Contrast this result with the earlier study of *technological opportunism*. This latter study differed from the former, as it found the critical connectivity between internal and external motivation. Unlike the first, this study showed that the decision to adopt and renew technology depended on both internal and external forces. Such a disparity in findings for both studies may be the result of dissimilar methodology, settings, unit of analysis, and dimensions being tested. For that matter, this issue merit further analysis.

### **c. Malaysian SMEs and their Application of the Internet Technology**

The historical development of SMEs in Malaysia depicted the high priority of the government in ensuring SMEs became the seed bed for entrepreneurial growth (Hashim *et.al*, 2002). The government's National Economic Policy and the Malaysian Development Plans justified this contention.

The Malaysian government's effort to refocus the efforts of SMEs, which comprised 92.6 % of the total manufacturing establishments in the informal sector (Navaratnam, 1997; Liew, 2000; Nain and Anuar, 1998), was clearly seen in the Second Industrial Master Plan (IMP2: 1996 to 2005). One of the four key strategies of the IMP2 was to encourage and commercialize research and development for SMEs. This continues as Malaysia moves into materializing the Third Industrial Master Plan (IMP: 2006-2020). While the focus currently is to enhance innovative and creative human capital in all

sectors, the emphasis toward developing globally competitive SMEs remains (Hong Leong Bank, 2006). This explained that SMEs were central to the enhancement of key industry clusters in Malaysia.

Similar to SMEs in many other countries, SMEs in Malaysia operated in various industries. They accounted a large portion of the total number of businesses in various sectors of the Malaysian economy: 1) agriculture such as rubber, pepper and rabbit ranches; 2) basic raw materials such as rattan, marble and chemicals; 3) general business services such as laundries, tax and management consultants, bowling alleys and upholstery; 4) manufacturing sector such as food, bakery, sawmills, toy factories, clothing, paper mills, candle, furniture, printing, soft drink bottling, small machine shops, ironworks, ready- mixed concrete plants, fertilizers plants, rubber gloves, and more recently, electrical and electronic appliances and components. Of the four categories, Malaysian SMEs appeared to be relatively most important in the manufacturing sector.

The government provided SMEs with grant assistance of up to a maximum of 70% of total project cost to finance product, process and quality improvements, market development, skills upgrading and acquisition of strategic technology and factory audits.

E-commerce Grant allowed SMEs to obtain grants up to 70% of project costs or RM10,000, whichever was lower, to design the welcome page, electronic product catalogues, cost of registration and hosting in community portals (Small and Medium Industry Development Corporation, 2001).

Herbig and Palumbo (1994) postulated that countries which have a high level of homogeneity in terms of culture and socio-economic background would adopt technology much faster than countries which were heterogeneous. Malaysia, as a case in point, is heterogeneous in terms of both its population culture and socio-economic background. Would this become an impediment to the process of electronic endeavor adoption among its groups of entrepreneurs? It would be a discovery to further probe this contention.

#### **d. Motivation for Accepting the Internet Technology Among SMEs**

SMEs emerged as the central subject in this study because as business enterprises, they utilized technology as a way of creating and sustaining wealth (Smith, 1776, Khalil, 2000) for their shareholders. In Malaysia, SMEs require continuous renewal in value, cash flow and technology. Such needs for internal, continuous renewal built the foundation for SMEs' competitive edge.

In addition, SMEs operated in a changing environment, which was pushed by globalization and technological convergence. These twinning forces required SMEs, in fact any firm to renew its technology, for the sake of managing its limited resources. Therefore, SMEs needed to renew its existing technology by incorporating the Internet technology into their existing business processes.

To add into the spectrum of discussion, critical mass became an extrinsic motivation that drove technological renewal among SMEs from the perspective of Internet technology (Pai, 2000; Iacovou *et.al*, 1995; Akkeren and Cavaye, 1999). Interestingly, all these studies found critical mass in the form of external pressure set by the SMEs' partners, competitors as well as consumers as significant to the process of adopting either the Internet- Electronic Data Interchange (Pai, 2000; Iacovou *et.al*, 1995) or electronic commerce among SMEs.

From the other angle, a developing nation may also have groups of SMEs which were driven by intrinsic motivation. In this case, it would constitute the entrepreneurial mindsets that impact the process of renewing existing technology.

### **The Hypotheses**

The sophistication of SMEs' existing technologies became a main concern as it may likely drive SMEs to appreciate a new and upcoming technology. Such sophistication, as discussed in the concept of *technological opportunism* (Srinivasan *et.al*, 2002) included the SMEs' awareness to detect technological development that paves the way to potential sources of growth. SMEs which embraced such paradigm may likely believe that technological sophistication is crucial in the renewal of value for

the organization and the stakeholders. If there is low *sense-and-respond* capability, a SME may less likely to adopt any new technology, especially the Internet-applications. Thus, the following hypothesis is forwarded:

**Hypothesis 1:** The greater the firm's technological opportunism, the higher the adoption level of the electronic endeavor.

The fluidity in which a firm interacts with its external environment may influence its readiness to be involved in a technology adoption. The external environments of SMEs consist of two realms: the general and the task environment (Hashim *et.al*, 2002). Vital to this study, the concern would be on the critical mass within the task environment.

Extrinsic motivations may emerge from SMEs involvement with the suppliers, customers (Iacovou *et.al*, 1995), partners (Pai, 2000) and competitors (Hashim, 2002). When SMEs have major dependency on at least one of these external constituents, the SMEs would more likely to adopt or renew their technology (Akkeren *et.al*, 1999). Firms also conformed to the social expectations of their stakeholders as such conformity generated access to the scarce resources they required to succeed (DiMaggio and Powell, 1991). If competitors and trading partners and the whole industry adopt the Internet technology, the individual SMEs may fear of being left behind, and thus, be likely to take action to adopt as well. Hence, the following hypothesis is forwarded:

**Hypothesis 2:** The greater the institutional pressures on a firm to adopt the technology, the higher its adoption level of the electronic endeavor.

## **Methodology**

The methodology for this research consisted of two phases. The first phase included a preliminary qualitative phase, in the form of interviews with SME entrepreneurs, as well as panel of experts in electronic endeavor issues and SMEs. The second phase was an in-depth quantitative survey of small and medium sized enterprises (SMEs) in Klang Valley, Malaysia.

The similar double-phase method of combining survey, focus group meetings or interviews has been found to generate in-depth findings in previous research (Kanter, 2001; Mullins, Duan and Hamblin, 2000; Mac Elroy, 2000; Srinivasan *et.al*, 2002). Previous studies on this issue in Malaysia (example: Poh and Chong, 2002; Liew, 2000, Sulaiman *et.al*, 2000) relied solely on survey questionnaires, may project external validity while advancing theory through repeated measurement. But the internal validity and the question of how could the conclusions truly explain the original study population may still be unexplored. This was another reason why this study opted to combine both methods as a way to accelerate not only the process of testing hypotheses and generalizability, but also interpretations of the problems being identified.

### **a. Qualitative Inquiry**

The qualitative phase of this study employed a purposive sample. This group included six owner-managers of SMEs, all located in the Klang Valley area. The study chose unstructured face to face interviews among other types of qualitative methods because it has the potential of providing rich data, especially on issues which were still exploratory in nature (Sekaran, 2003).

Six of the SMEs' owner-managers who were chosen for the interview sessions have businesses ranged from interior designs, building and office constructions, management consultancy, health care product manufacturing, car insurance and service, and a grocery retail outlet. All of them have been in business for five years or more. Such choices of entrepreneurs that represent different categories, provided the study requisite information pertaining to the hypotheses testing. The researcher collected data from the interview by making direct written notes during the interview, as most of the respondents objected the usage of tape recorders.

Below were the questions which each of the respondents answers in isolation. The researcher basically developed all the questions.

1. Do you, as the firm owner influence your/the firm's adoption of the Internet technology?
2. Do your firm's external environments have significant influence on the adoption of the Internet technology? If so, which one/s play an important part?
3. To what extent is your firm is aware of the needs to adopt Internet applications?

### **b. Quantitative Inquiry**

The quantitative research process applied a cross-sectional survey methodology. It mostly employed a number of pre-tested and adapted scales, as well as newly created scales for those areas which were still untested by previous research. The underlying strategy was to 1) measure the relationships among the variables namely, the various organizational, entrepreneurial and external attributes with the electronic endeavor adoption tools; 2) determine the clusters of relevant variables required for prediction; and 3), analyze the patterns of relationships between the independent and dependent variables.

### **Dependent Variable**

The dependent variable of interest in this study was technology renewal from the perspective of adopting Internet applications into SMEs' existing business processes, which is also termed as *electronic endeavor*. In operationalizing the adoption level of the *electronic endeavor*, this study incorporated two principles. First, technology adoption occurred in stages. Second, the adoption of the *electronic endeavor* involved two factors, namely the number of applications and the functions of such applications pertaining to the firm's business processes.

The two factors above were relevant, as previous studies on the adoption of either electronic commerce or electronic business also based their measurement either one or both of these two aspects (Gretzel *et.al*, 2001; Kanter, 2001; Yuan, Gretzel and Feisenmaier, 2003; Srinivasan *et.al*, 2002). The stages of technology adoption specific to this study incorporated the modification of various models from both empirical and theoretical work (Hoque, 2000; Gretzel *et.al*, 2000; Liew, 2000; Boey et. al, 1999; Hartman et. al, 1999, Kanter, 2001). For the purpose of this study, the researcher expanded and operationalized these models by developing five stages of incorporating the Internet applications into an organization's business processes. The current study brought newness to this five stages model by combining both categories of the number of applications and how those applications functioned within the scope of the firm's business processes. Table 1 depicts the five stages of *electronic endeavor*, while explaining the manner in which the dependent variables will be operationalized.

**Table 1:** The Dependent Variable: Measurement And Items of Electronic Endeavor

<b>Electronic Endeavor Stages</b>	<b>Items (Number of Applications and Functions)</b>
Conventional Practice	<p><u>Typical applications:</u> zero</p> <p>Firm interacts with customer and performs transactions using traditional ways such as face to face, phone and fax. No personal computers, workstations or terminals are used in administration; production and marketing practices of the firm.</p>
Brochureware	<p><u>Typical applications:</u> a company web-site; online catalogs, and electronic mails.</p> <p>Firm uses tools to advertise products/services; attracts new kinds of customers not previously reached; communicate with trading partners. However, actual transactions and customer interaction are still conducted over traditional media.</p>
Electronic Commerce	<p><u>Typical applications:</u> a company web-site; online catalogs; electronic mails; electronic ordering; order status tracking; payment systems.</p> <p>Firm uses tools to conduct commercial transaction with customers.</p>
Electronic Business	<p><u>Typical applications:</u> a company web-site; online catalogs; electronic mails; payment systems; electronic procurement; extended value chain; customer relationship management and enterprise resource planning.</p> <p>Firm uses tools to perform demand and supply planning; logistics; production planning; works with customers online and trading partners online- (exchange data, track orders, modify designs, solve problems and purchase products online); conducts meetings over the Internet, across locations; gets employees feedback and reactions online; deliver training online- to increase employees' skills; allows telecommuting; performs marketing research on consumers, suppliers and competitors.</p>
Electronic Enterprise	<p><u>Typical applications:</u> a company intranet which has complete system of security and access control; user profiling; search engine; content management; cataloging; payment; workflow management; event notification; collaboration; reporting analysis; data/message integration.</p> <p>Firm uses tools to generate real-time information sharing with all trading partners, and performs a customer-centric business model.</p>

**Sources:** Adapted from Kanter, R.M. "E-venture!: Succeeding in the Digital Culture of Tomorrow, Harvard Business Review, January, 2001; Hoque, F., E-enterprise, Cambridge University Press, 2000

### **Independent Variables**

There are two independent variables for this study, as depicted in Table 2. In specific to this paper, the researcher coined the first variable, *technological opportunism* as a construct reflecting external motivation. The second variable, *institutional pressures* represented internal motivation.

**Table 2:** The Independent Variables: Measuring the “Organizational Characteristics” of the SMEs

Hypothesis	Independent Variables	Variable Constructions/Measurement
<p>1. The greater the firm’s technological opportunism, the higher the adoption level of electronic endeavor.</p>	<p>technological opportunism</p>	<ul style="list-style-type: none"> <li>• technology sensing capability                             <ul style="list-style-type: none"> <li>• the firm is often the first in industry to detect technological development that may potentially affect business</li> <li>• actively seeks knowledge on technological changes in the environment that may affect business</li> <li>• periodically reviews the likely effect of changes in technology</li> </ul> </li> <li>• technology response capability                             <ul style="list-style-type: none"> <li>• generally responds quickly to technological changes in the environment</li> <li>• first in the industry to respond to new technologies</li> <li>• accepts new technologies that cause current investments to gain value</li> </ul> </li> <li>• The entrepreneur keeps telling employees that the firm must gear up to meet changing technology trends</li> <li>• The entrepreneur convinces employees on the benefit of new technology</li> <li>• The entrepreneur encourages employees to develop new technologies</li> <li>• The entrepreneur in this firm is a champion of new technology</li> </ul> <p>(Srinivasan,Lilien, Rangaswamy, 2002)</p> <p>This current study adds :</p> <ul style="list-style-type: none"> <li>• Ability to pay for installation costs, implementation of any subsequent Internet applications</li> <li>• Ability to secure loans</li> </ul>
<p>2. The greater the institutional pressures on the firm to adopt the technology, the higher its adoption level of electronic endeavor.</p>	<p>Institutional/ stakeholders’ pressure</p>	<ul style="list-style-type: none"> <li>• Satisfying the needs of major customers is an important factor in implementing the Internet technology applications</li> <li>• Some of our major customers demanded that the firm has Internet applications in the business relationships</li> <li>• Business relationship suffers if the firm does not implement Internet technology applications</li> <li>• Having a state-of-the-art Internet technology applications confers the firm’s status with the stakeholders</li> <li>• The firm might have lost its edge over competitors if it does not implement Internet technology applications</li> </ul> <p>(DiMaggio and Powell, 1991; Srinivasan <i>et.al</i>, 2002)</p>

The population under study, which became the unit of analysis was all the small and medium enterprises within three sectors: 1) manufacturing, 2) retail, and 3) service in Klang Valley, Malaysia. This was irrespective of whether they have already adopted *electronic endeavor* applications or not. This study focused on the SMEs that resided in the Klang Valley, as this area was the hub of SMEs and large scale businesses with adequate Internet infrastructure. This study employed the SMIDEC registry to locate its respondents, and the agency’s most recent records showed that there were 907 firms located in the Klang Valley area. SMIDEC (or re-established as SMECorp in 2009) stands as a government agency that provides equal support and development opportunities to all SMEs, regardless of their backgrounds and ownerships. Hence, the SMIDEC registry, above all other sources, has the ability to present an exact replica of the whole SMEs’ population.

## Findings & Discussion

### a. Qualitative Findings

All the SMEs involved in this qualitative enquiry have companies’ websites, except for the grocery retail outlet. This outlet would prefer to maintain in its traditional practices and did not even plan to have its web site up in the future.



In varying degrees of importance, the entrepreneurs pointed financial factors, lack of IT skills, conservative mindsets of workers and managers, as organizational characteristics that influenced the companies' inclination to further their *electronic endeavor*. Four of the entrepreneurs believed that their interests and enthusiasm drove their companies' endeavor to adopt the Internet applications. The owner of the health care manufacturing company was an IT savvy and created his own company's website. The owner-director of the car service and insurance company, at 71 years old, admitted that he did not know any IT skills, yet always encouraged his employees to use all the Internet applications which his company has subscribed.

The findings also indicated consensus of the sample in describing the significance of the companies' external environment. One of the two interior design companies stated that adoption of the internet technology was comparable to the "*kiasu*" concept. He built his company's website because his competitors and most other businesses have websites and email access. He felt his company gained a better status by having its own website. The owner of the retail outlet was not interested to have any Internet applications because none of his direct competitors has a website. Among the four companies which have websites, only one conducted its business transactions via the Internet. This was the car service and insurance company. The other three companies used their websites merely as a communication tool and would want to maintain in such a way in the near future. Only the manufacturer of the health care products intended to improve his company's website designs and buy a separate server to conduct online transactions. He also realized the importance of ensuring all his employees interacted with each other electronically, and thus further implement electronic business.

Overall, the entrepreneurs considered the needs for a change in the mindset and attitude as the main driver that led to changing their traditional technology system to *electronic endeavor*. The employees have to be properly trained, while the older ones needed to go for re-training in order to eliminate their fear of computers. Among all these companies, the manufacturer of the health care products was the most pro-active. He was the one with an eye to evolve his website and pushing it to do more than just a communication tool. He was also willing to do such processes himself, without simply depending on any Internet service provider.

## **b. Quantitative Findings**

### Psychometric Properties: Electronic Endeavor as the Dependent Variable

#### Electronic Endeavor Index

Before testing the hypotheses, this study creates an index for the electronic endeavor by summing up the two scores of both items, namely 'extent' and 'sophistication'. The creation of this index was in line with the idea that indices and summated scales have the ability to portray complex concepts in a single measure, while reducing measurement error (Hair *et.al*, 1998). The researcher took into account the basis of conceptual definition in order to achieve face and content validity. In addition, the electronic endeavor index was also assessed on its reliability.

As discussed earlier, *electronic endeavor* was measured using two items, namely 1) "Extent": number of Internet applications; 2) "Sophistication": how the Internet applications function in firms' business processes. On a 100% score, both these items were divided into equal proportions of 50% each. Hence, on a total combination score of 16, each "extent" and "sophistication" earned an equal score of 8.

Under the "extent" scale, a respondent firm was given one score for each number of Internet applications listed in the questionnaire. Firms which operated without any Internet application would earn a zero score. Those which have bought multiple Internet applications would earn a score of one to eight, based on the number of applications.

Under the "sophistication" scale, a respondent firm which did not use any Internet applications in its business activities received zero. A firm which used the Internet applications in any of its business activities got a score of two or above, depending on the applications level of sophistication.

In building the *electronic endeavor index*, the score for each individual “extent” and “sophistication” was added. Accordingly, the index for a respondent firm in the conventional stage was zero because it did not have any Internet application, and thus did not use the Internet in its business processes. Table 3 exemplifies respondent firms which manage to earn perfect scores for each level of the electronic endeavor.

**Table 3:** The *Electronic Endeavor Index*: the Maximum Score for Each Stages

Electronic Endeavor Stages	“Extent”	“Sophistication”	combination of “extent” and “sophistication”
Conventional Practice	0	0	0
Brochureware	3	2	5
Electronic Commerce	5	4	9
Electronic Business	7	6	13
Electronic Enterprise	8	8	16

However, not all firms manage to gain these maximum score (0, 5, 9, 13, 16) which concretely put them in the specific stages of the *electronic endeavor*. Almost all of the respondent firms stated that they have electronic mails and company websites, but did not use them in their business activities at all. This led the firms to achieve lesser score than what they were supposed to gain in the brochureware level. The score that the respondent firms earned through the index was the data which would be incorporated for further analysis of this study. With this in mind, the *electronic endeavor index* became a ratio scale, thus portraying itself as a metric data.

### Descriptive Findings of Electronic Endeavor

All 226 responses on the *electronic endeavor* section of the survey was loaded in SPSS 12.0, and resulted in several findings. To estimate reliability, this study applied the method of internal consistency by determining the Cronbach’s coefficient. Based on Nunnally’s guideline (1978), scale reliability of 0.70 and above is preferred. Items which have less than 0.30 item-to total correlation could be deleted to improve the reliability of the scales (Nunnally, 1978). In this case, the *electronic endeavor index* gained a Cronbach’s coefficient alpha of 0.86.

Further descriptive analysis on the data revealed that a large percentage of the respondent firms (76 percent) resided at the lower end of the electronic endeavor stage, namely the conventional and brochureware levels. Only 24 percent of the respondent firms applied Internet to transact, interact and share their business activities with their stakeholders. These firms were either in the electronic commerce, electronic business or electronic enterprise stages. It was also found that various respondent firms had bought several Internet applications, yet did not use it in their business activities. For instance, some respondent firms stated they have email and company websites in the “extent” column, but maintained to tick the conventional column in the “sophistication” scale of the electronic endeavor. This resulted in many firms unable to achieve the maximum score of the specific electronic endeavor stage. If the full score of the brochureware level were five, most SMEs only earned three or four. Table 4 portrays the whole results of the frequency test.

**Table 4:** Electronic Endeavor Readiness of SMEs in Klang Valley (N=226)

Electronic Endeavor Stages	Electronic Endeavor Scale	Total SMEs (in number)	Total SMEs (in percentage)
Conventional practice	0	48	22
Brochureware	1-5	122	54
Electronic Commerce	6-9	32	14
Electronic Business	10- 13	14	6
Electronic Enterprise	14- 16	10	4

### The Independent Variables

*Technology opportunism* consisted of eight items. The reliability of this scale, as measured by Cronbach’s coefficient alpha was 0.88.

H1: The greater the firm’s technological opportunism, the higher the adoption level of the electronic endeavor

This hypothesis predicted that firms which have high *technological opportunism* tend to be at the higher end of the electronic endeavor stage than firms that have not. For this hypothesis, the electronic endeavor index was correlated with the measures of *technological opportunism*. The correlation coefficient was 0.285 (p= 0.64), thus showing that there is a relationship between electronic endeavor and technology opportunism, though the strength of the relationship is weak.

**Table 5:** Relationship Between *Technological Opportunism* and Adoption of Electronic Endeavor Among SMEs in Klang Valley, Malaysia

Variables	Mean	Std. Deviation	Correlation coefficient
Technological Opportunism	3.2384	.79561	0.285
Electronic Endeavor	4.24	3.857	

On the other hand, *institutional pressure* consisted of five items. These five items measured the influence of entities outside the firms such as customers and distributors. This factor gained a Cronbach’s coefficient alpha of 0.81.

H2: The greater the institutional pressures on the firm to adopt the technology the higher its adoption level of the electronic endeavor

Hypothesis 2 predicted that firms which have greater *institutional pressures*, tend to be at the higher end of the electronic endeavor stage than firms that have not. This prediction was mainly scoped from the perspectives of the SMEs’ customers, competitors and trading partners For this hypothesis, the electronic endeavor index was correlated with the measures of *institutional pressures*. The correlation co-efficient was 0.421 (p=0.00). The result showed significant, positive relationship between electronic endeavor and institutional pressures. Table 6 details this finding.

**Table 6:** Relationship Between *Institutional Pressure* and Adoption of Electronic Endeavor Among SMEs in Klang Valley, Malaysia

Variables	Mean	Std. Deviation	Correlation Coefficient
Institutional Pressure	3.1628	.857	.421
Electronic Endeavor	4.24	3.857	

As noted in the theoretical underpinning, *technological opportunism* concerns firms’ proactive behavior in seeking and responding to new technologies, based on their internal motivation. Though the result is was insignificant, was interesting at this point is was the combination of items resided in the *technological opportunism* construct. The organizational antecedents in *technological opportunism* are was not only constrained to technological aspects. This study also manages managed to bring newness to the existing concept of *technological opportunism* (Srinivasan *et.al.*, 2002) as it incorporated the importance of firm’s financial willingness, namely to borrow money, and use firm’s savings to implement electronic endeavor. The inclusion of such financial consideration was due to the fact that the process of sensing and responding to new technologies reflected an effort towards research and development. Any venture of research and development especially concerning technology management and adoption required investments of money (Khalil, 2000). Even during the qualitative phase of this study, three of the six entrepreneurs interviewed, admitted that they must have the willingness to secure a few thousand ringgits for the purpose of implementing some Internet applications. This qualitative basis strengthened the quantitative results. Technologically opportunistic

firms have had the proclivity to renew their technology as they readily have had a strong complement of technological and financial drive.

The findings of this study interpreted external environment as *Institutional Pressures*. Firms conformed to the social expectations of their stakeholders, which in this study concerned competitors, customers, trading partners such as suppliers and distributors. The qualitative probe explained that SMEs built companies' websites because of "*kiasu*", or fear of being left behind especially by competitors.

At this point, the present study found that renewing a technology from traditional paper based operation to *electronic endeavor* can be instigated either by intrinsic motivation (*technological opportunism*) or extrinsic motivation (*institutional pressure*) of the SMEs. Within the context of this research, extrinsic motivation (*institutional pressure*) was more significant than intrinsic motivation (*technological opportunism*). Such different outcomes from another study done earlier in America (Srinivasan *et.al*, 2002) might have been the result of divergent culture, business environment, and government orientation towards the business sector between Malaysia and America.

### **Implications and Conclusions**

Intrinsic motivation precipitates entrepreneurial efficacy, because it drives self-initiated activities despite conditions of the external environment. However, Malaysian SMEs are peculiar compared to entrepreneurs 'born' in America and other well-developed regions which have internal proclivity to renew technologies. Based on the findings of this research, Malaysian SMEs were motivated significantly by their external environment. For instance in this study, Malaysian SMEs know the move toward Internet technology as a fact, but, the mass movement towards proactively capitalizing technology renewal was yet to occur.

Organizations which aim to network with Malaysian SMEs should have the capacity to push the pacesetters to continuously renew technologies. On the other hand, such networking must also be able to change the paradigm of the laggards. The fear of pressures from competitors, trading partners and potential markets which have already embraced electronic endeavor is not necessarily a bad thing, when Malaysian SMEs can respond with a competitive attitude. To follow the whole industry in adopting electronic endeavor is also not destructive, as long as SMEs' entrepreneurs first determine which parts of their firms' resources and business processes that need to get fixed and re-aligned with the process of technology renewal.

It is high time for Malaysian SMEs to unleash the stereotype that they are non-archetypal capitalists by becoming more independent with the advancement of technology and globalization. What may be lacking and need to be developed is 'entrepreneurial creativity' among Malaysian SMEs. This should pave ways for two important new capabilities. First, it may lead to continuous learning and sharing with others through courageous ventures of trial-and-errors. Second, it should be able to move from a reactive to kaleidoscopic mindset that mobilizes entrepreneurs to seek newness and innovation in the way they do things. The behavior of Malaysian SMEs to associate with external institutions such as the chamber of commerce, industry-wide organizations, business associations, multinational corporations and government agencies depicts their needs to create networks. In fact, forming collaboration with complementary businesses, large firms or even competitors under the token of smart partnership are also areas that Malaysian SMEs' entrepreneurs could tap. It is something that Malaysian SMEs could learn from established formidable alliances such as *keiretsu*, *chaebols* and *sogoshosha*.

## References

- [1] Akkeren, J.V. & Cavaye A.L.M. (1999). Factors Affecting the Adoption of E- Commerce Technologies by Small Business In Australia, an Empirical Study.<http://www.acs.org.au/act/events/io1999/akkern.html>, retrieved 9/13/09
- [2] Alderfer, C.P. (1969). An empirical test of a new theory of human needs, *Organizational Behavior and Human Performance* 4, 142-175
- [3] Birch, D.L. (1979). *The Job Generation Process*. Cambridge, Mass.: MIT Program on Neighbourhood and Regional Change.
- [4] Boey, P., Grasso, M. Sabatino, G., & I. Sayeed. (1999). Architecting e-business Solutions. <http://www.cutter.com/research/1999/crb990831.html>, retrieved 15/06/2009.
- [5] Daft, R.L. (2001). *Organization Theory and Design*, 7th edition. Cincinnati, Ohio: South Western College Publishing.
- [6] DiMaggio, P.I. & Powell, W.W. (1991). 'Introduction' in *The new institutionalism in organizational analysis*. Walter W. Powell and Paul J. DiMaggio (eds.), 1-38. Chicago: University of Chicago Press.
- [7] Dunnette, M.D.& Hough, L.M. (1990). *Handbook of Industrial and Organizational Psychology*, 2<sup>nd</sup> ed., vol.1, Palo Alto, CA: Consulting Psychologists Press, p. 75-170.
- [8] Friedman, D. (1998). "Is Big Back? Or Is Small Beautiful?" Inc Magazine, April, 1<sup>st</sup>. <http://www.inc.com/magazine/19980401/899.html>, retrieved 28/11/2009
- [9] Gretzel U. & Fesenmaier, D.R. (2001). Measuring Effective IT Use Among American Convention and Visitors Bureau. In P.J. Sheldon, K. Woeber and D.R. Feisenmaier, *Information and Communication Technologies in Tourism*.
- [10] Hair,J.F.Jr, Anderson R.E & Tatham R.L., Black W.C. (1998). *Multivariate Data Analysis*, Prentice Hall International edition.
- [11] Hashim, M.K. & Wafa, S.A. (2002). *Small and Medium-sized Enterprises in Malaysia: Development Issues*. Kuala Lumpur: Prentice- Hall.
- [12] Hartman, A., Sifonis, J. & Kador, J. (1999), *Net Ready*. Mc Graw-Hill.
- [13] Hong Leong Bank (2006). Third Industrial Master Plan: Towards global competitiveness, [http://www.hlb.com.my/wsb/Research/Economic\\_News/Malaysia/mimp3.pdf](http://www.hlb.com.my/wsb/Research/Economic_News/Malaysia/mimp3.pdf), retrieved 12/13/09
- [14] Hoque, F. (2000). *E-enterprise*, Cambridge University Press.
- [15] Hu,P.J., Chau, P.Y.K., and Sheng, O.R.L., (2000). Investigation of factors affecting Healthcare organization's adoption of telemedicine technology. *Proceedings of The 33rd Hawaii International Conference on System Sciences*.
- [16] Iacovou, C.L., Benbasat,I. & Dexter, A.S. (1995) "Electronic data interchange and small organizations; adoption and impact of technology, *MIS Quarterly*, no 19 (4),pp. 465-485.
- [17] Kanter, R.M. (2001). *E-volve! Succeeding in the Digital Culture of Tomorrow*. Harvard Business Press.
- [18] Khalil, T. (2000). *Management of Technology*. Mc Graw Hill (International Edition).
- [19] MacElroy, W.H., (2000). New technology adoption and barriers to innovation in the marketing research industry. A doctoral dissertation research for the Golden Gate University, San Francisco.
- [20] Maslow, A.H. (1954). *Motivation and Personality*, New York: Harper & Row
- [21] Mullins, Duan, Hamblin (2000). "An analysis of factors governing the use of E- Commerce in SMEs". *First World Congress on the Management of Electronic Commerce*, Mc Master University, Hamilton Canada, January, 2000.
- [22] Pai, S. (2000). A model of E-Business adoption by small business: From electronic data interchange to the internet. A doctoral dissertation, University of Hawaii, USA.

- [23] Poh, J.P. & Chong, Y.L. (2002). “Understanding e-commerce adoption among Malaysian’s manufacturing companies”, *3rd World Congress on The Management of Electronic Commerce*, Mc Master University, Hamilton, Ontario, Canada, January 16-18.
- [24] Sadler-Smith, E., Hampson, Y., Chaston, I., and Badger, B. (2003). Managerial behavior, entrepreneurial style, and small firm performance, *Journal of Small Business Management*, vol. 41(1), pp. 47-67.
- [25] Sekaran, U. (2003). *Research Methods for Business: A Skill Building Approach*. International edition: Wiley.
- [26] Small and Medium Industry Development Corporation (2001). Small and Medium Industry Development Plan
- [27] Srinivasan, R., Lilien, & G.L., Rangaswamy, A. (2002). Technological opportunism and radical technology adoption: an application to e-business. Institute for the Study of Business Markets, Pennsylvania State University.
- [28] Sulaiman, A. & Jani, R. (2000). E-commerce implementation in Malaysian manufacturing sector. Proceedings of International Conference on Emerging Trends of E-commerce, Multimedia University, Petaling Jaya, November 21- 23.
- [29] Sulaiman, A. & Jaafar, N. (2003). An overview of e-commerce practices among small retailers in four cities. In the proceedings of *The National Seminar on Electronic Commerce*, Universiti Tun Abdul Razak, Petaling Jaya, October 7.
- [30] Tornatzky, L.G. & Fleischer, M (1990). *The Processes of Technological Innovation*. Lexington, MA: Lexington Books.
- [31] Vroom, V.H. (1964). *Work and Motivation*, New York: Wiley.
- [32] Yuan, Y., Gretzel, U. Feisenmaier, D. (2003). Internet technology use by American convention and visitors bureau. *Journal of Travel Research*, Vol. 41, No. 3, 240-255 (2003), SAGE Publications.
- [33] Zeleny, M. (1986). High technology management. *Human Systems Management*, vol. 6, pp. 109-120.