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Relative Advantage and Competitive Pressure towards Implementation of E-commerce: Overview of Small and Medium Enterprises (SMEs)

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Abstract

The study of SMEs and E-commerce is acquiring much attention from academicians and practitioners as SMEs play a vital role in generating vast amount of nation's revenue at present day. Therefore, the contribution of SMEs to economic development in spite of their scarce resources needs intense and passionate study so as to examine the factors which will influence E-commerce adoption among SMEs. Seeing that much research that examines the E-commerce adoption among SMEs and as far as this, researches mainly just concentrate on large firms or organizations, this study aims to analyze the key factors of E-commerce adoption among SMEs in Northern state of Malaysia which comprise of Perlis, Kedah, Penang and Northern part of Perak. Key factors such as relative advantage and competitive pressure are specifically conducted in this research. Above and beyond, this study is conducted based on survey design and descriptive research investigation. Approximately 350 questionnaires are distributed to CEOs or managers diversified from different sectors but only 167 questionnaires were obtained. The research data is analyzed using frequency analysis, reliability analysis, descriptive analysis, correlation analysis as well as multiple regression analysis.

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1. Introduction

E-commerce adoption can be defined as “set up of a company web site to share information, maintain relationships as well as carry out transaction using electronic networks” (Zwass, 1996, pg. 3-23). SMEs who play a vital role in shaping the future economy and even considered as the backbone of industrial development in our country due to involvement in activities ranging from petty traders, grocery store operators, medium-sized contract manufacturers supplying parts and components to multinational corporations and professional services such as software firms or medical researchers selling their services to overseas markets (Alam, S. S. *et al*, 2007) can widely gain fundamental benefits from E-commerce as time and space barriers can be eliminated from the internet-based platform implicit to this definition. SMEs have a huge potential not only to promote domestic-led growth but also to strengthen the infrastructure in our country. For accelerated economic expansion and development, SMEs’ role is inarguable no matter in new and existing industries.

In spite of this, 80% within 700,000 SMEs in Malaysia did not own websites and preferred to conduct their business in conventional way (The Star online news, April 2012). Low adoption of business online and E-commerce by SMEs is due to lack of awareness of its benefits and perception that E-commerce tools and technology were expensive (The Star online news, April 2012). Moreover, in this new competitive e-environment, SMEs need to adopt innovative and informed e-marketing strategies to remain distinct, profitable and succeed in domestic and international markets. (UNCTAD, 2004; Wresch, 2003). Environmental context which dominates competitive pressure is conceded to be one of the important factors that should be studied by any researcher who researches E-commerce adoption due to its critical role in market competition (Alzougool and Kurnia, 2008). In this case, the researchers are interested and intended to conduct a study towards SMEs in Northern state of Malaysia regarding their perceptions of relative advantage and competitive pressure towards E-commerce adoption.

2. Literature Review

2.1. E-commerce

According to digital marketing research firm eMarketer, Global E-commerce sales reached \$1.08875 trillion in 2012; this value increased tremendously 21.9% from \$893.33 billion in 2011. The report by eMarketer added that, Asia-Pacific take over North America in 2013 to retrieve most of the global sales and China drives most of Asia-Pacific’s E-commerce growth. In addition, Kearney (2013) stated that Global Retail E-commerce Index ranks the top 30 countries in both developing and developed countries for their online market attractiveness, discovered that developing countries feature outstandingly in the index where developing countries seize 10 out of the 30 spots, together with first-place China.

In previous year, Goldman Sachs proposed that the E-commerce market in Malaysia would be worth of US\$ 1.1 billion in 2012, with a 30% year-on-year growth while Euromonitor estimated low but still remarkable estimate of US\$ 623 million by 2016. In fact, Bank Negara of Malaysia’s reported on payments in 2013 that discloses the overall transaction value from credit cards and international debit cards was US\$ 30 billion where 12% or US\$ 3.6 billion transaction from Internet/ E-commerce. E-commerce in Malaysia is expected to be expanded to an unlimited space where big players introduced to the market as well as local players forming partnerships to hold off foreign competition.

Harrington and Reed (1996, pg.68-77) identified E-commerce as “the electronic exchange of information, goods, services and payments” while Choi et. al. (1997) defined E-commerce as “the utilization of electronic equipment to carry out business”. Grandona and Pearson’s (2004, pg.197-216) definition of E-commerce as “the process of purchasing and selling products or services using electronic data transmission via the Internet and www.” However, according to the definition, the solely utilization of electronic mail or the use of a website for electronic publishing purposes does not constitute E-commerce. There are six types of E-commerce regarding the indication of Turban, Lee, King and Chung (2000) and it is anticipated that Business- to-Business E-commerce (B2B) and Business- to-Customer (B2C) E-commerce dominate the major two among total categories of E-commerce.

2.2. Relative advantage

Rogers (1962) identified relative advantage as extent to which customer observe a new product or service as enhanced than its substitute while in 1993, Rogers defined relative advantage as “the degree to which an innovation is perceived as being better than the idea it overtakes” (p.229). Tornatzky and Klein (1982) claimed that this attribute is lacked of theoretical strength, dependability and prescriptive power as the definition was extremely broad. In spite of this, Lertwongsatien and Wongpinunwatana (2003) found out that as the level of understanding of relative advantage of E-commerce is higher, the higher chances for the firm to adopt E-commerce.

A number of studies which used this attribute to associate with innovation adoption and the findings shown were not consistent. For instance in Singapore, Soh, Mah, Gan, Chew and Reid (1997) studied about the practice and understanding of early adopters. Through this study, the respondents stated that the Internet had optimistic effect on firm's image and customer contentment though there is no relative advantage on increasing market shares or sales. As well, Seyal and Rahman (2003) figured out that there is irrelevant about relative advantage to E-commerce adoption. Conversely, there are still lots of researchers that show there is a positive relationship between relative advantage and E-commerce adoption including: Lertwongsatien et al. (2003), Tan and Teo (2000), Tan and Teo (1998), Premkumar and Ramamurthy (1995).

2.3. The effect of relative advantage towards E-commerce adoption

The research that accomplished by Soh et al. (1997) in Singapore is conducted on early adopters about their perception of innovation adoption. The participants revealed that there were no virtual advantages neither on their growing market share nor sales in organization even though Internet had positive impact on corporation's image and client's satisfaction. Moreover, research conducted by Seyal et al. (2003) in Brunei also disclosed that relative advantage was a trivial factor that leads to E-commerce adoption. However, Mac Gregor & Vrazalic (2008) carried out research in Australia in order to examine the determinants that impinge on E-commerce adoption by utilizing quantitative approach and separating unit of analysis into adopters and non-adopters. The result divulged that appropriateness of E-commerce, methods of performing business and also E-commerce relative advantage had positive effect on implementation of E-commerce. In Malaysia, Shah Alam, Ali & Mohd Jani (2011) pinpointed the determinants that have an effect on SMEs E-commerce adoption by assessing a unit of factors including relative advantage and discovered that this factor has significant relationship with execution of E-commerce. Wanyoike, Mukulu & Waititu (2012) agreed with Shah Alam et al. (2011) that they revealed that crucial contributor to E-commerce among SMEs is simply relative advantage and observability. Based on Wanyoike et al. (2012), the benefits acquired from E-commerce adoption are easiness of work; enhance client's contentment, cost reduction as well as improved productivity. Thus, hypothesis is proposed as below:

H₁: There is a significant relationship between relative advantage and E-commerce adoption among SMEs in Northern state of Malaysia.

2.4. Competitive pressure

Competition pressure is defined as the extent of competitive atmosphere within the industry in which the companies operate (Lertwongsatien et al., 2003). Pfeffer and Leblebici (1977) illustrated that organizations are likely to adopt innovation due to intense competition in this competitive environment. Besides, Reich and Benbasat (1990) also proposed that an association is possible to distribute resources for offering innovative products or services to react to the competitors in an extremely cut-throat environment.

Majority of the empirical studies proved that higher innovative adoption possibility is related with higher competitive pressure. For instance, Zhu, Kraemer, and Xu (2003) investigated about electronic business adoption by European company and concluded that the adopters are beneath higher competitive pressure than the non-adopters. Moreover, at the same year, Lertwongsatien et al. (2003) also reviewed E-commerce adoption among small and medium enterprises in Thailand and found out that E-commerce adopters are more likely to adopt innovate system in an intense competitive surroundings.

2.5. The effect of competitive pressure towards E-commerce adoption

Research completed by Chang (2006) denoted that mainly Taiwanese CEOs supposed that their corporation were in a high rivalry intensity industry which signified that the firm had intense competition among the same field from analysis of frequency distribution. However, the feature of competitive pressure only had association with extent of E-commerce adoption on B2B communication with insignificant correlation value along with the small effect size. It is further explained that competitive pressure had insignificant association with implementation of E-commerce on B2C communication whereby the correlation r or ρ value only denoted 0.027 and the overall correlation r or ρ value for E-commerce adoption including B2B and B2C just 0.031. Hence, the entire research by Chang (2006) disclosed that competitive pressure had negative relationship with E-commerce adoption. Conversely, Lertwongsatien et al. (2003) examined that SMEs in Thailand are more likely to adopt innovation system under intense competitive environment and this come out with positive association between competitive pressure and E-commerce adoption. This research was as well supported by Almoawi (2011) in Saudi Arabia that intense competition pressure induces SMEs to adopt E-commerce applications.

H₂: There is a significant relationship between competitive pressure and E-commerce adoption among SMEs in Northern state of Malaysia.

3. Research methodology

The proposed research method involved a survey of CEOs or managers among small and medium enterprises (SMEs) in Northern state of Malaysia to investigate how specifically relative advantage and competitive pressure influence E-commerce adoption among SMEs as shown in Fig.1. Quantitative research by distributed questionnaires is conducted by asking the respondents how the factors influence on their implementation of E-commerce in their organizations. Therefore, a self-structured questionnaire would be allocated to CEO or manager in SMEs of Northern state of Malaysia in order to gather the essential primary data. Probability sampling in which simple random sampling will be adopted in this study as it has slightest bias and tenders the most generalizability. The questions are categorized and structured under the independent variables discussed in the literature review. Over half of the items used in this questionnaire are therefore specifically developed for this study based on literature in research journals, newspaper and article in magazine. Subsequently, the questionnaires were distributed to potential respondents by researcher via electronic interface which is e-mail chiefly. However, in order to collect additional response surveys from respondents, a quantity of the questionnaires were distributed personally by researcher to the respondents. Furthermore, there were a number of optimistic feedbacks acquired through social media channel for

instance Facebook. In order to achieve sample size suggested by Cavana, Delahaye and Sekaran (2011), more than 300 questionnaires were sent out for this research.

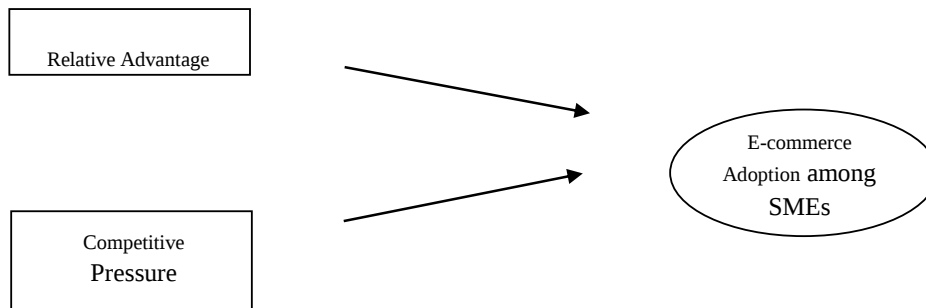


Fig. 1. Conceptual Framework

4. Analysis and findings

Around 350 questionnaires were distributed and only 167 questionnaires were collected. Overall, the response rate is about 47.71% and it is predicted that the non-response reasons might be due to technical failure while delivering questionnaire to the respondents, the server error of respondents' domain or the e-mail account that author tried to reach does not exist anymore and so on. Among 167 respondents, 100 (59.9%) are males while 67 (40.1%) are females. Data also supported a findings that more than half of respondents which is approximately 59.3% do not own their company website while there are only 40.7% which is 122 respondents possess their own company website.

4.1 Descriptive statistics

Table 1 shows the mean for all variables which ranged between 1.8409 and 3.0313. Mean for relative advantage is 2.9844, competitive pressure is 3.0313, and the extent of E-commerce adoption is 1.8409, indicates the respondents average agreed with the questions in general in terms of relative advantage and competitive pressure. Conversely, for the extent of E-commerce adoption, majority of the respondents are not at all used or occasionally using the E-commerce in their organization.

Table 1: Descriptive Analysis

Variables	Mean	Standard Deviation
Relative Advantage	2.9844	0.62119
Competitive Pressure	3.0313	0.50775

The extent of E-commerce Adoption

1.8409

1.00735

From Table 1, it can also be seen that the value of standard deviation for the extent of E-commerce adoption is 1.00735, which is large from mean value which reveals that standard deviation value for the extent of E-commerce adoption is less concentrate or being modest. It is added that standard deviation value for relative advantage and competitive pressure is 0.62119 as well as 0.50775. For that value, responses from respondents are acknowledged as concentrated as the values are smaller from mean value.

4.2 Reliability analysis

The number items of each variables and the Cronbach Alpha were shown in Table 2. In this study, any item that was not significant will be deleted in order to obtain the highest reliability of the measurement. Regarding Sekaran (2009), the nearer the figure of reliability coefficient to 1.00, the better the appliance generally whereas reliability over 0.80 is good and those less than 0.60 is measured to be poor.

Table 2: Reliability Analysis

Variables	Number of Items	Cronbach Alpha
Relative Advantage	8	0.972
Competitive Pressure	4	0.843
The extent of E-commerce Adoption	11	0.972

Thus, all variables were accepted according to Table 2, which ranging from 0.843 to 0.972, in which relative advantage and the extent of E-commerce adoption obtain the same reliability coefficient.

4.3 Correlation analysis

The Pearson's correlation is employed to discover the relationship between at least two continuous variables. Davis (1997) rule of thumb testified that 0.70 and above indicated very strong relationship, 0.30-0.49 indicated moderate relationship whereas 0.10 indicated very low relationship between two variables.

Table 3: Correlation Analysis

	Relative Advantage	Competitive Pressure	Extent of E-commerce adoption among SMEs
Relative Advantage	1		
(IV1)			
Competitive Pressure	0.695	1	
(IV2)			

Extent of E-commerce adoption among SMEs	0.823*	0.843**	1
(DV)			

Note: * Correlation is significant at 0.05 levels (2-tailed)

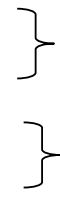
** Correlation is significant at 0.01 levels (2-tailed)

From Table 3, the findings show that correlation between relative advantage and the extent of E-commerce adoption is shown in r-value which is 0.823 or 82.3% at 99% confident interval. In accordance to the rule of thumb by Davis (1997), this corresponds to a strong and positive relationship. Additionally, the correlation is significant at 0.05 levels (2-tailed). This finding of this study is intensely supported by previous studies that depicted relative advantage has positive relationship with the implementation of E-commerce (Gilaninia et al., 2011; Elmazi, Vukaj, Gega & Elmazi, 2011; Shah Alam et al., 2011; Wanyoike et al., 2012; and Saffu, Walker & Mazurek, 2012). The second correlation is between competitive pressure and the extent of E-commerce implementation among SMEs and the findings show that r-value is 0.843 which signifies very strong relationship between these two variables. Furthermore, the correlation is significant at 0.01 levels (2-tailed) and the study findings is supported by prior studies which indicated that competitive pressure has positive and strong relationship with E-commerce adoption (Lertwongsatien et al., 2003; Grandona et al., 2004; Lip-Sam & Hock-Ean, 2011; Elmazi, Vukaj, Gega & Elmazi, 2011; Saffu et al., 2012).

4.4 Regression Analysis

As shown in Table 4, the standard coefficient is 0.570 for relative advantage while competitive pressure is 0.244. The value of R-Square indicates that 58.1% of the variance in the extent of E-commerce adoption can be predicted from the variables of relative advantage as well as competitive pressure.

Table 4: Regression Analysis (Dependent variable: The extent of E-commerce adoption among SMEs)

Serial	Independent Variables	Beta	Significance value (Sig.)
1	Relative Advantage	0.570**	0.000
2	Competitive Pressure	0.244**	0.001
$R^2 = 0.581$ Adjusted $R^2 = 0.576$ F Change = 113.867 Sig. = 0.000^b  Model Summary ANOVA^a			

Meanwhile, the p-value is compared with the alpha value (normally 0.05) and if small, it can be presumed that the independent variable constantly expect the dependent variable. Regarding Table 4, it can be revealed that the two independent variables which are relative advantage $p = 0.000$ and competitive pressure $p = 0.001$ show a statistically significant relationship with the extent of E-commerce adoption among SMEs and they can be used to reliably predict the extent of E-commerce adoption among SMEs in Northern state of Malaysia. In a nutshell,

relative advantage together with competitive pressure has significant influence on E-commerce adoption among SMEs in Northern state of Malaysia.

Table 5: Summary of the Hypotheses testing results from Multiple Regression Analysis

Hypothesis	Remarks
There is a relationship between Relative Advantage and E-commerce adoption among SMEs in Northern state of Malaysia	Supported
There is a relationship between Competitive Pressure and E-commerce adoption among SMEs in Northern state of Malaysia.	Supported

Table 5 acutely presents summary of the hypothesis testing results from Multiple Regression Analysis. The first hypothesis which is ‘There is a relationship between Relative Advantage and E-commerce adoption among SMEs in Northern state of Malaysia’ is supported while second hypothesis which is ‘There is a relationship between Competitive Pressure and E-commerce adoption among SMEs in Northern state of Malaysia’ is supported as well.

5. Discussion and conclusion

From the finding of the study (See Table 5), it showed that there is significant influence of relative advantage towards implementation of E-commerce among SMEs. The outcome of this study validates prior studies which discovered that relative advantage was a significant forecaster for implementation of E-commerce among SMEs (Mac Gregor et al., 2008; Shah Alam et al., 2011; and Wanyoike et al., 2012). On the contrary, the finding of this study is contradictory with research conducted by Soh et al. (1997) in Singapore and finding performed by Seyal et al. (2003) in Brunei which denoted the majority of CEOs of SMEs were hesitant about the relative benefits that can be gained from E-commerce adoption. This study observe that the CEOs who implement E-commerce adoption significantly believe that E-commerce not only able to increase sales, expand market share, cut down costs, exploit new business prospects but also will improve relationship with dealers and companion. Although competitive pressure can be used to reliability expect the dependent variable but this finding is primarily not supported by research completed by Chang (2006) in Taiwan whereby it illustrated that environmental context (competitive pressure) did not considerably contribute to the model for predicting the extent of E-commerce adoption from the entire series of predictors possibly due to difference of culture and civilization. Furthermore, this finding is also not verified by former study under OTE model that external competitive pressure is not significant to e-business adoption whereby the $\beta = -0.06$, $t = -0.35$, $p < 0.10$ (Suhaiza, Noornina, Yusof, 2009).

6. Limitations and recommendations

There are some limitations in this research including the sample size itself is relatively small and a larger sample size is desirable to accurately evaluate the perception of the SMEs in Northern state of Malaysia towards E-commerce adoption. Therefore, it is suggested that future research can be done in larger sample size that allows higher response rate for more robust statistical analyses. More constructs should be included in future research whilst this study only involved two constructs. Moreover, another limitation of this study is the types of SME that targeted respondents occupy. Four main industries which are services, manufacturing, construction, and ICT are investigated in this study. From this study finding, it vividly illustrates that largely CEOs are engaged only in services and manufacturing sectors which comprises of more than 80% among other industries that involved. Owing

to dissimilar organizational and CEO's traits among various industries, this study may not be generalized to entire SMEs. Furthermore, this study solely utilizes quantitative approach for further data analysis. Even though this approach is tolerable as it is measured in arithmetic manner, it might not capable to interpret human sentiment or observation into numerical form. Thus, it is recommended that in future research; various methodologies can be used for data analysis for instance qualitative approach. Besides that, an amalgamation of both quantitative and qualitative approaches for example in detail interview and group conversation may possibly enhance potency to the findings of this study.

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