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Article

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RESEARCH

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Impact of external factors on determining E-commerce benefits among SMEs in Malaysia

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Abstract

This paper examines how the external factors – i.e. customers, competitors – that driven Malaysian SMEs to adopt E-Commerce may influence the benefits these SMEs gained by adopting such technologies. The findings show the SMEs that were driven to adopt E-Commerce by customers demand are less likely to experience the reduction of operational cost. The results also show that SMEs would be able to achieve most of the expected benefits of E-Commerce adoption, if it is aimed as a tool to improve the competitiveness of the business.

Keywords: E-Commerce, SMEs, External factors, Adoption, Benefit

Background

The advent of Electronic Commerce (E-Commerce) has re-landscaped the business world. It has been more than a decade, governments advocating the adoption and use of E-Commerce among Small Medium-sized Enterprises (SMEs). E-Commerce has been extensively advertised as a technology that enables SMEs to compete with their larger counterparts. Previous research show that the demand from customers and pressure of competitiveness in the business sector are two of the important renowned driving factors for E-Commerce adoption by SMEs (Acılar & Karamaşa, 2010; Evans & Bosua, 2017; Kartiwi, 2010; Mazzarol, 2015). In terms of benefits, considerable attention in the extant literature had been devoted to identify the benefits or values of E-Commerce in SMEs, such as reducing the operational cost, improving customer retention and improving external linkages (Kartiwi, 2010; Mazzarol, 2015; Alemayehu Molla & Heeks, 2007; Alemayehu. Molla & Licker, 2005).

Despite the extensive research on identifying the drivers that led these SMEs to adopt E-Commerce and gain its benefits, limited attention had been given on how the external factors – i.e. customers and competitors – may influence the benefits obtained. Hence, this paper attempts to address such gaps in the literature by focusing on two objectives:

1. To develop a framework that assess the influence of external factors on the benefits that SMEs experienced from E-Commerce adoption.

2. To use this framework and robust statistical techniques such as Partial Least Square (PLS) to examine the framework quantitatively.

External factors and SME'S e-commerce adoption

To evaluate the antecedents and significances of E-Commerce adoption and use in SMEs context an integrated theoretical model is developed, theorized, and tested by Bi et al. (2014). They identified that the key antecedents to achieve and sustain E-Commerce value are, among others, market orientation and business partnerships.

The study by Voges and Pulakanam (2011) shows that, in New Zealand SME retail enterprises identified few factors towards technological innovations in SMEs. External pressure, legal structure, size, types and level of Internet use are some of them. As Voges & Pulakanam (2011) cited, due to lacking of experts, less human, financial and technological resources, critical software and applications are avoided by most SMEs. Klaiber et al. (2014) highlights customers and suppliers pressure as an influential factor of adoption of E-Commerce. According to Klaiber et al. (2014), in the adoption of E-Commerce, management approaches, corporate strategy and technological strength, customers and suppliers pressure are influencing factors. Such findings are aligned with the earlier results shown by Yeh et al. (2015). They asserted that IT maturity, infrastructure and human resources, top management support, partnership quality, and competitive pressure are the key IT capability influencing factors.

Customer demands on business to implement certain practices are customer power (F. Wu, Mahajan, & Balasubramanian, 2003). Customers and suppliers pressure is other renowned factors that have driven SMEs to adopt E-Commerce (Aguila-Obra & Padilla-Meléndez, 2006; Oliveira & Martins, 2011; Sin et al., 2016; Xu, Rohatgi, & Duan, 2008). Investigation by Wu et al. (2011) shows that, customer power subsequently influences firm's investment in adoption and use of new technologies. Owing to the emergence of internet technology, customers can order online and track orders via electronically. Powerful customers have capabilities for more convenient services and lower transaction costs (Bi & Smyrniotis, 2009).

Market attention that shows the degree of market dominance by a few large firms in the industry is competition intensity (Tornatzky & Fleischer, 1990). Businesses with many competitors may be affected by competitive rivalry and offer comparable products and services (Robinson, 2012). For survival and to stay competitive and innovative SMEs adopt and use E-Commerce (Grandon & Pearson, 2004). To strengthen competitive position and achieve superior firm performance SMEs may be influenced by competitive pressure (Grandon & Pearson, 2004). Lin (2006) suggests that competitive pressure is a determinant of IS strategies in organizations.

E-commerce benefits by SMES

Previous research documented the many benefits that SMEs may gain from adopting E-Commerce. These benefits can be tangible or intangible in nature (Quayle, 2002). Among the prominent tangible benefits is cost reduction in production and running the business (Mustaffa & Beaumont, 2004; Poon & Jevons, 1997; Quayle & Christiansen, 2004; Ratnasingam, 2002; Xu et al., 2008). These studies claim that e-Commerce is as an easier and cheaper way of doing business, because customer's orders can be accepted, confirmed, processed, and paid in an online environment. In

addition, by reducing in the amount of mundane paperwork and enforcing proper integrity mechanisms, organisations are able to improve their internal efficiency (Daniel & Wilson, 2002; Kartiwi, 2010), reduce the number of errors in data processing (Koenig & Wigand, 2004; Marri, Gunasekaran, & Kobu, 2003) and improve the distribution channel (Poon & Swatman, 1999; Quayle & Christiansen, 2004; Xu et al., 2008).

It is interesting to note that the benefits recorded from the studies in developing countries show slightly different trend. Among the few studies that examined the benefits of E-Commerce adoption in developing countries the study of 102 SMEs across several cities in China by Tan and Ouyang (2004) is notable. In their study they found that the most significant benefits of e-Commerce adoption reported by Chinese firms were a widened sales area, improved competitive position, and improved customer service, while the impacts on internal process efficiency and decreased procurement costs are less significant. This suggests that online business has affected sales more than efficiency in China.

In Thailand, Ngampathanakul and Pilling (2005) reported that the increased internal efficiency and improved customer service were the most common benefits of E-Commerce adoption and use by SMEs. This finding is echoed by a study of 106 Ghanaian non-traditional exporters by Hinson & Sorensen (2007), which also found increased internal efficiency as the most common reported benefits of e-Commerce use. Interestingly, none of these studies (Ngampathanakul & Pilling (2005) and Hinson & Sorensen (2006)) reported any sales-related benefits in their findings. This supports the notion that the advantages of adopting e-Commerce may not always come only in measurable benefits. Often, the main incentives for using e-Commerce lie in the intangible benefits (MacGregor, 2004).

E-commerce and SMEs in Malaysia

In Malaysia, similar to other countries, SMEs are a vital component of the country's economic development. According to the SME Annual Report 2013–14, SMEs represent 99.1% of the total establishments in the country (SME Corp, 2015). Related to Internet utilization, the Report indicated about 33.3% have used the Internet service but for personal purposes only, and not for business operations. In this study, SME Corp (2015) revealed that only 7.6% of the respondents were involved in online transactions or have adopted E-Commerce in the business. This figure is unexpectedly low considering the various incentives and grants provided by the government to promote the uptake of E-Commerce by SMEs.

Research shows that the slow development of E-Commerce among Malaysia SMEs may be explained by factors related to perception of the implementation of E-Commerce as risky and technically challenging (Sin Tan, Choy Chong, Lin, & Cyril Eze, 2009). In a more recent study by Ahmad, et al. (2015), they identified several distinct factor that contribute to the slow uptake of E-Commerce by SMEs in Malaysia. Among others is the lack of manager/owner's knowledge and expertise in IT, hence triggered the fears that this technology might become a disruption to the business operations.

Despite the slow uptake of E-Commerce among SMEs, internet usage in the country has increased. In 2014, the findings of Nielsen's Global Survey of E-Commerce shows more than 58% of Malaysian consumers had purchased a product or service online

(Nielsen Holdings N.V, 2014). It is also interesting to note that Malaysians spent the majority of their online retail purchases worth RM825million on local websites (45%) compared to 35% on overseas websites. This implies that local merchants, particularly SMEs, can take advantage of this growing market by providing quality products and services through online channels. The survey also revealed that social networking is the most prominent online activities among Malaysian, 71% of total online activities (Nielsen Holdings N.V, 2014).

Proposed framework

The aim of this study is to assess how the external factors – i.e. customers, competitors – that driven Malaysian SMEs to adopt E-Commerce, may influence the benefits gained by adopting such technologies. In this paper, the authors exclusively focus on external factors to understand the extent of its influence on actual benefits experience after adopting E-Commerce in greater details. The authors also aim to shift the discussion beyond organizational factors - such as size, sector, and top management's leadership behaviour - which have studied extensively.

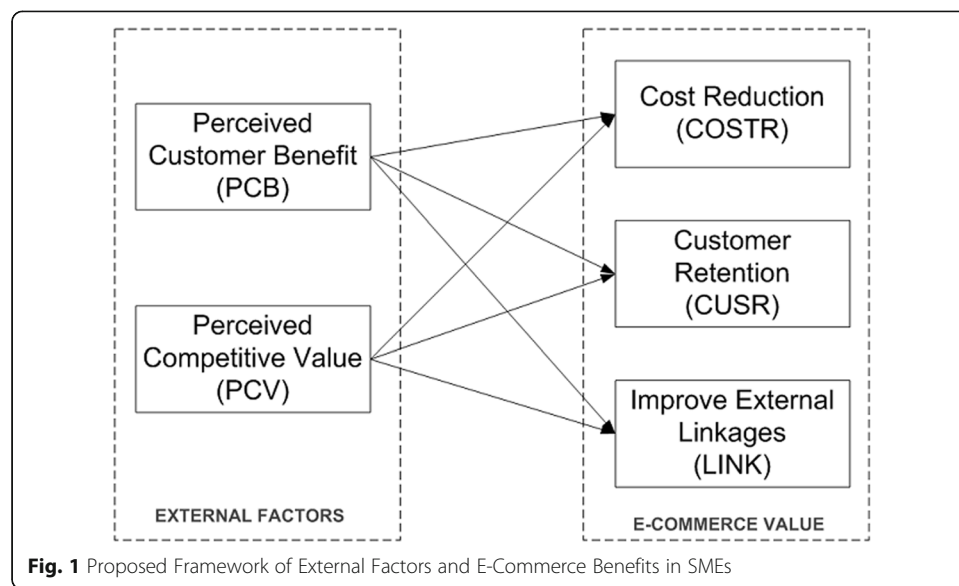
As indicated in the earlier studies, among the renowned external factors led SMEs to adopt E-Commerce is peer pressure (Aguila-Obra & Padilla-Meléndez, 2006; Oliveira & Martins, 2011; Xu et al., 2008). In their research, Xu et al. (2008) highlight that the lack of pressure from business partners, suppliers and customers of using advanced E-Commerce technology for competitive advantages influences the level and scale of its adoption in SMEs sector.

In addition, former studies reveal a number of benefits that motivated SMEs to adopt E-Commerce, such as cost reduction in running day-to-day operations (Dong, Wu, & Li, 2016; Xu et al., 2008). Other most reported E-Commerce adoption advantages in the literature are the better linkages with external entities and how E-Commerce helps SMEs to retain customers (Abou-Shouk, Lim, & Megicks, 2016; I.-L. Wu, 2003).

By drawing on the above literature, a framework to assess the external factors and benefits of E-Commerce adoption in Malaysian SMEs is proposed. Below are the hypothesis formulated in this study:

- H1: SMEs with greater perceived customer benefit are more likely to experience cost reduction benefits
- H2: SMEs with greater perceived customer benefit are more likely to experience customer retention benefits
- H3: SMEs with greater perceived customer benefit are more likely to experience improve external linkages benefit
- H4: SMEs with greater perceived competitive value are more likely to experience cost reduction benefits
- H5: SMEs with greater perceived competitive value are more likely to experience customer retention benefits
- H6: SMEs with greater perceived competitive value are more likely to experience improve external linkages benefit

To sum up the two contexts along with their factors, Fig. 1 depict the proposed framework. Table 1 shows the list of questionnaires items, code and constructs.



Methods

This study adopts a quantitative approach by using survey method to collect data. This approach helps to collect information from a large number of SMEs in the retail sector in Malaysia. The instrument was developed by adapting past questionnaires related to the study (Alemayehu, Molla & Licker, 2005; F. Wu et al., 2003; Zhu et al., 2004).

The instrument was pretested among academics and scholars to ensure that the questionnaire achieves the level of clarity and validity required. Modification to the instrument was done based on suggestions given by the experts to increase the validity and reliability of the questionnaire. Pilot study was also conducted by distributing 50 questionnaires to SME owner/managers. A total of 18 useful responses were received and based on the analysis, further refinement was made to the instrument before its finalization for the main survey.

This study used the list of 1000 addresses of retail SMEs which were obtained from the Malaysia SME Corporation (SMECorp), which is the government-linked organization in charge of development of small-medium sized businesses. The criteria used is based on the 2014 definition of Malaysia SMEs where in the non-manufacturing sector, SMEs are business organizations with not more than 75 employees or sales turnover not exceeding RM20 million. Questionnaires were mailed to the CEO/Manager of SMEs outside Klang Valley. For SMEs within Klang Valley region, a number of enumerators (data collectors) were employed to distribute the questionnaire in person by meeting the owner of the company. Such strategy is adopted to increase the number of responses. For the mailed questionnaire, a cover letter that explained the research purpose and scope was included together with a self-addressed, stamped return envelope. Follow-up letters were sent after the initial mailing. To increase the number of responses, face-to-face distribution of the questionnaire was also conducted. Finally, a total of 200 responses were received which represent 20% response rate and out of the total. Out of 200 responses collected, only 181 SMEs had adopted E-Commerce which can be included for further analysis.

As mentioned earlier in this paper, one of the aims of this study is to propose a framework using a robust statistical technique, such as Partial Least Square (PLS). This

Table 1 List of Questionnaires Items

External Factors	Perceived Competitive Value		
	PCV1	Our company has the capability to deal with rapid change	Alemayehu. Molla & Licker (2005)
	PCV2	Our company will be left behind if we did not adapt with the new technology	Alemayehu. Molla & Licker (2005)
	PCV3	Response to competitor actions is crucial	Alemayehu. Molla & Licker (2005)
	PCV4	Pressure from competitors to adopt E-business	Alemayehu. Molla & Licker (2005)
	Perceived Customer Benefit		
	PCB1	Secure online transaction and protection of customers' sensitive data	Zhu, Kraemer, & Dedrick (2004)
	PCB2	Customers can register and set up personalized accounts	Zhu, Kraemer, & Dedrick (2004)
	PCB3	Customers are better served online	Zhu, Kraemer, & Dedrick (2004)
	PCB4	Customer will be well informed on updates of new products/promotion	Zhu, Kraemer, & Dedrick (2004)
E-Commerce Benefits	PCB5	Return or exchange of products facilities for customer convenience	Zhu, Kraemer, & Dedrick (2004)
	Cost Reduction		
	COSTR1	Cost reduction of general management activities	F. Wu et al. (2003)
	COSTR2	Cost reduction of coordination with suppliers, customers and business partners	F. Wu et al. (2003)
	COSTR3	Cost reduction in marketing of the product	F. Wu et al. (2003)
	COSTR4	Cost reduction of production and transaction	F. Wu et al. (2003)
	COSTR5	Cost reduction of acquiring new customers	F. Wu et al. (2003)
	Customer Retention		
	CUSR1	New customers have increased	F. Wu et al. (2003)
	CUSR2	Reduce customer defections	F. Wu et al. (2003)
	CUSR3	Customer satisfaction	F. Wu et al. (2003)
	CUSR4	Customers are more loyal than before	F. Wu et al. (2003)
	External Linkages		
	LINK1	Strengthen business relationship with partners and suppliers	F. Wu et al. (2003)
	LINK2	Longer relationship between our suppliers and business partners	F. Wu et al. (2003)

is due to the nature of this technique which would allow the exploration and prediction of the variable included in the study. PLS path modeling is also recommended for study in an early stage of theoretical development, as it allows the researchers to test and validate exploratory models (Hair, Sarstedt, Ringle, & Mena, 2012).

Results

Profile of respondents

As mentioned in the previous section, 181 responses were analysed in this study. Table 2 shows the profile of the E-Commerce adopters.

Table 2 Profile of the SMEs

	Frequency	Percent
Age of company:		
5 years or less	81	44.8
6–10 years	75	41.4
11–15 years	15	8.3
More than 15 years	10	5.5
Category:		
Wholesaler	19	10.5
Retailer	147	81.2
Service	12	6.6
Others	3	1.7
Full time staff:		
Less than 5	60	33.1
5–29	115	63.5
30–75	3	1.7
75 or more	3	1.7
E-Commerce Level of Adoption:		
Pure online business	12	6.6
Online and offline	169	93.4

Table 2 shows that more than half of the responding SMEs (63.5%) comprise of 5 to 29 employees which are considered as small enterprises, and about 33.1% has less than 5 employees which fall under the category of micro enterprises, following the Malaysia definitions of SMEs. It is interesting to note that almost all of the SMEs in the sample (93.4%) conduct their business using both channels, online and offline. This indicates that majority of these SMEs are using the online channel to support their business, while brick and mortar shop is still perceived to be important to complement its business operation.

Results of PLS path modeling

In order to test the proposed framework developed in this study, Partial Least Square (PLS) was used for both the measurement model and structural model for data analysis. Such technique is deemed to be appropriate for this study due to its inherent characteristic, which is the ability to model latent variables with small to medium-sized samples (Chin, 2000).

Since the proposed framework in this study uses both formative and reflective constructs, it is important for the authors to examine the outer loadings and outer weights for reflective and formative indicators separately (Wong, 2013). Table 3 shows the matrix of outer weights for the formative constructs, i.e. PCB and PCV. Table 4 shows the outer loadings for the reflective constructs included in the instruments, i.e. COSTR, CUSR, and LINK.

As can be seen in Table 3, only “Customers can register and set up personalized accounts” (PCB2) and “Customers are better served online” (PCB3) were best to be used as the manifest variables to describe the Perceived Customer Benefits ($p < 0.05$).

Table 3 Matrix of Outer Weights for PCB and PCV

	Sample Mean	Standard Deviation	T Statistics	P Values
PCB1 -> PCB	0.171	0.143	1.200	0.231
PCB2 -> PCB	0.485	0.125	3.954	0.000
PCB3 -> PCB	0.492	0.130	3.839	0.000
PCB4 -> PCB	-0.012	0.156	0.081	0.935
PCB5 -> PCB	0.170	0.146	1.273	0.204
PCV1 -> PCV	0.299	0.114	2.560	0.011
PCV2 -> PCV	0.121	0.136	0.866	0.387
PCV3 -> PCV	0.518	0.175	3.064	0.002
PCV4 -> PCV	0.408	0.134	3.163	0.002

On the other hand, there were only three items in Perceived Competitive Value construct were significant to be included in the analysis. These are “Our company has the capability to deal with rapid change” (PCV1), “Our company will be left behind if we did not adapt with the new technology” (PCV3), and “Response to competitor actions is crucial” (PCV4). Table 4 shows the matrix outer loadings for three reflective latent variables, namely cost reduction (COSTR), customer retention (CUSR) and improve external linkages (IEL), which are included as part of E-Commerce Benefits. The result of the outer loading shows that all of manifest variables are significant to be included in the study ($p = 0.000$).

Hence, only 16 items were then processed in the model via PLS assessment. To test the path coefficient significance of the proposed framework, the authors used bootstrapping algorithm.

Figure 2 shows the result of the PLS assessment on the proposed framework.

In this study, the assessment of the proposed framework includes estimating path coefficients and R^2 . Hulland (1999) suggested that both R^2 and the path coefficients shows how the model fit (effectiveness), which is a measure of the validity of the model. In addition, the statistical testing (t-test) of path coefficients is used to make conclusions regarding associations of the latent variables.

As can be seen in Fig. 2, the framework applied to the SMEs E-Commerce adopters resulted in only five paths with the acceptable effect size. Different to conventional wisdom, the result of path analysis as depicted in Table 5 shows the small effect size of perceived customer benefit (Path Coefficient = 0.177, $p = 0.063$). This indicates that the influence of such construct on the latent variable Cost Reduction benefit, is low. Interestingly, both Customer Retention (PC = 0.295, $p = 0.000$) and Improve External Linkages (PC = 0.255, $p = 0.004$) are positively associated with how SMEs perceived E-Commerce adoption may benefit their customers. Perceived competitive value (PC = 0.400, $p = 0.000$) was the construct with the highest path coefficients of all 5 (five) paths. It shows a positive relationship with Cost Reduction benefit ($p = 0.000$). Perceived competitive value was also found to have significant correlations with Customer Retention (PC = 0.346, $p = 0.000$) and Improve External Linkages benefits (PC = 0.393, $p = 0.000$).

It is interesting to note that all paths are in expectation-confirmation process of the model which is significant at 0.05 level, except the path between perceived customer benefits as the driving factor, and cost reductions benefits. In order to obtain the global validity of the model, Tenenhaus et al. (2005) suggested a Goodness of Fit (GoF)

Table 4 Matrix of Outer Loadings for COSTR, CUSR and IEL

	Sample Mean	Standard Deviation	T Statistics	P Values
COSTR1 < – COSTR	0.911	0.016	55.379	0.000
COSTR2 < – COSTR	0.871	0.029	30.138	0.000
COSTR3 < – COSTR	0.886	0.021	43.125	0.000
COSTR4 < – COSTR	0.910	0.017	55.154	0.000
COSTR5 < – COSTR	0.850	0.027	31.043	0.000
CUSR1 < – CUSR	0.862	0.029	29.341	0.000
CUSR2 < – CUSR	0.907	0.015	60.104	0.000
CUSR3 < – CUSR	0.791	0.041	19.424	0.000
CUSR4 < – CUSR	0.822	0.030	27.165	0.000
LINK1 < – IEL	0.979	0.006	175.947	0.000
LINK2 < – IEL	0.976	0.007	132.802	0.000

measure for the PLS path modelling. The calculated GoF value is 0.754, which way exceeds the cut-off point of 0.36. Thus shows that the model performs well.

Discussion and conclusions

There are several findings emerged from this study. First, the empirical findings show that when SMEs adopt E-Commerce to better serve the customer online, it enables these businesses to retain customers while on the same time improves their linkages with business partners and suppliers; however, providing a better service to customer may not necessary lead to cost reductions. Perhaps this is due to the fact that in this research, the cost reductions benefit was not only associated with transactional cost. Instead, it covers all aspect of the business expenses such as managerial, marketing, production and so on. Thus, although E-Commerce may reduce the cost of

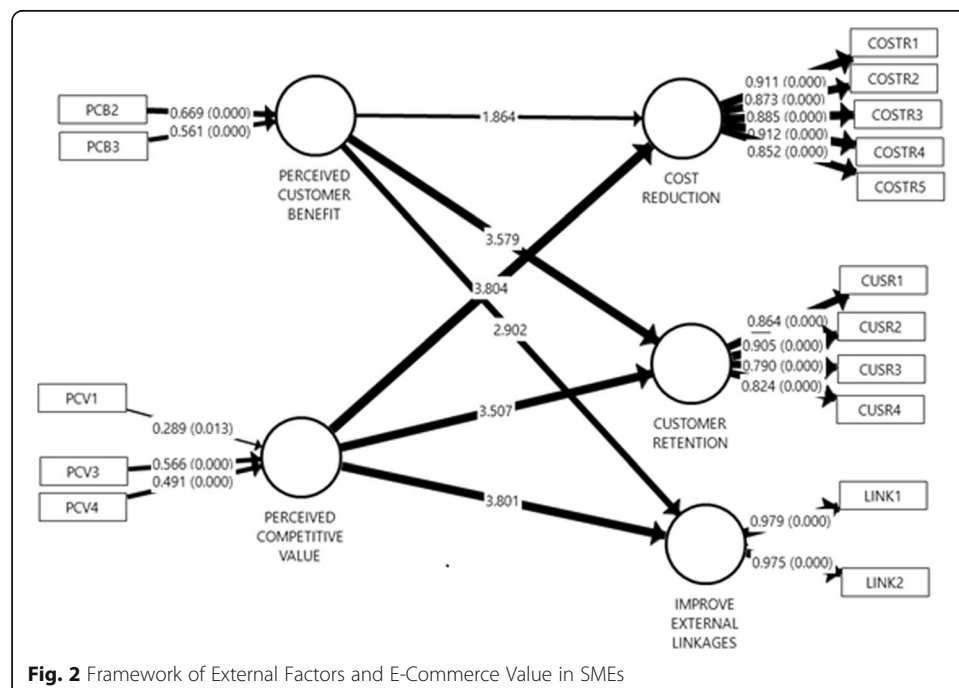


Table 5 Result of PLS Path Analysis

Constructs	Path Coefficient	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Perceived Customer Benefit -> Cost Reduction	0.177	0.096	1.864	0.063
Perceived Customer Benefit -> Customer Retention	0.295	0.083	3.579	0.000
Perceived Customer Benefit -> Improve External Linkages	0.255	0.086	2.902	0.004
Perceived Competitive Value -> Cost Reduction	0.400	0.103	3.804	0.000
Perceived Competitive Value -> Customer Retention	0.346	0.093	3.507	0.000
Perceived Competitive Value -> Improve External Linkages	0.393	0.102	3.801	0.000

transactions, it may not necessary reduce other expenses incurred in the business, such as cost of production (Garicano & Kaplan, 2001).

The results of this study also further emphasize the importance of SMEs to be able to adapt with the current technology and response to their competitors actions in order to gain the optimum benefits of E-Commerce adoption. This finding is in accordance with the earlier studies carried out by Mazzarol (2015) and Xu, Rohatgi, & Duan (2008). As can be seen from the results, SMEs who are more vigilant and responsive to how their competitors strategically adopt and use E-Commerce in the business, were more likely to experience the cost reduction in running day-to-day operations.

Two major implications emerge from the findings of this study. First, this research highlights the importance of government to continuously provide support, particularly training and awareness on how SMEs should address the external pressure – both from competitors and customers. It is important for SMEs to understand the different benefits that they may gain from E-Commerce use, hence stress the importance to strategize its use in the business. Second, more efforts are also needed to explore the potential cost reductions that SMEs may experience post adopting E-Commerce. While the cost of Internet is becoming cheaper every year in developing countries, there are other costs associated with sustaining E-Commerce. Thus, it implies that more seminars, workshops and sharing sessions for SMEs entrepreneurs to identify other means and ways to reduce cost while, on the same time, providing their best service to their customers.

To sum up, this paper has provided empirical evidence to understand how external factors – i.e. customers and competitors – may influence the kind of benefits that SMEs would be able to gain from adopting E-Commerce in the business. The authors believe that these initial results will stimulate others to engage in further research that would help SMEs, the seedbed of our economy, to excel in e-world.

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Availability of data and materials

The datasets used and analysed during the current study are available from the corresponding author on reasonable request.

Authors' contributions

MK Data analysis, writing and preparing the manuscript. HH Instrument development and literature review. MAS Instrument development and literature review. MRMJ Data collection and data entry. MRA Data collection and data entry. All authors read and approved the final manuscript.

Competing interests

The authors declare that they have no competing interests.

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