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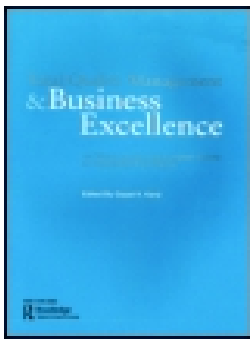
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The effects of service quality determinants on social networking site-based commerce: the Malaysian customers' perspective

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Although the information systems success model has been used widely in measuring the success of e-commerce, limited studies have been conducted focusing on identifying service quality (SQ) determinants that lead to the e-commerce success particularly s-commerce. This study examines the effect of SQ determinants on social networking site (SNS)-based commerce in the s-commerce context from the customer's perspective by adapting the IS success model and combining it with a modification of SERVQUAL. We analysed a total of 249 samples from an online survey through confirmatory factor analysis (CFA) and the structural equation model (SEM) using IBM SPSS AMOS to test the research model and hypotheses. The results indicate that assurance, responsiveness, and reliability have a significant effect on perceived usefulness and that empathy and responsiveness have a significant effect on customer satisfaction. In addition, the results show a positive relationship among perceived usefulness, customer satisfaction, and net benefits in SNS-based commerce.

Keywords: service quality; SNS-based commerce; s-commerce; customer satisfaction

Introduction

Increased interest in Web2.0 and social media has allowed conventional electronic commerce (e-commerce) to evolve into social commerce (s-commerce). In e-commerce markets, s-commerce is considered a new concept. Therefore, previous studies have defined it in many ways. Liang and Turban (2011) identified three major attributes, social media, community, and commerce activities, as the most essential elements that must be emphasised in defining s-commerce. Thus, s-commerce can be defined as a form of online business that combines e-commerce with community to facilitate consumers' online commerce activities (Stephen & Toubia, 2010). One of the most popular social media is SNS, which allows individuals to socialise and build their own virtual network communities that communicate and share information. Hence, in the s-commerce context, SNS is a tool by which to accomplish activities related to buying and selling.

Despite the potential benefits of SNS-based commerce, a problem-free customer experience is not guaranteed. In fact, SNS-based commerce could increase existing problems such as poor service, fraud, and inaccurate information. Failure to control such problems gives SNS-based commerce a bad reputation, making offline customers reluctant to shop online and damaging consumer confidence in SNS-based commerce. Among existing online customers, the same problems lead to dissatisfaction with SNS-based commerce. Once customers are satisfied and perceive SNS-based commerce as useful and beneficial to them, they might continue to use it, leading to customer loyalty and repurchases

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(Schaupp, Belanger, & Fan, 2009). However, heavy traffic on an s-commerce site caused by increasing use via SNS can contribute to poor service issues. Hence, an understanding of the service quality (SQ) determinants that affect customer satisfaction from the customers' perspective is important (Saravanan & Rao, 2007). Thus, frequent examination of customer satisfaction and perceived usefulness determinants should be conducted to match the changing nature of evolving Internet technology.

In the e-commerce context, the information systems (IS) success model, which considers quality dimensions such as system, information, and service (DeLone & McLean, 2003), has been used and extended to measure e-commerce success (John, 2012; Chen, Rungtungsamrit, Rajkumar, & Yen, 2013; Ghobakhloo, Hong, & Standing, 2014). The IS success model identifies SQ as one of the most important dimensions with a positive effect on perceived usefulness and customer satisfaction (e.g. DeLone & McLean, 2004; Brown & Jayakody, 2008; John, 2012). However, few studies have provided a detailed discussion of the effect of individual SQ determinants on perceived usefulness and customer satisfaction, particularly in the context of SNS-based commerce. Because s-commerce is still developing and is considered new in Asia including Malaysia, sellers lack understanding and knowledge about consumers' perceptions of SQ on SNS-based commerce. Therefore, we examine the effects of SQ determinants on SNS-based commerce from the customers' perspective and go beyond a simple s-commerce context by using the IS success model (DeLone & McLean, 2003) and adapting SERVQUAL (Pitt, Watson, & Kavan, 1995) to the study context to identify and explain each SQ determinant.

To achieve our study aim, we introduce SNS-based commerce to illustrate the use of SNS in s-commerce. *SNS-based commerce* is described as a seller's SNS page created deliberately to promote and sell products and services. Through this kind of SNS, users perform their online shopping activities. Previous studies (e.g. Kim, Periyayya, & Eik, 2013) considered SNS created for both promoting and selling, and personal use, particularly in a customer-to-customer (C2C) context. In this study, *online shopping activities* do not refer only to buying, selling, and doing online transactions but also to searching for information related to shopping activities and the SNS functions that link users to a seller's e-commerce web site. We focus on C2C and business-to-customers (B2C) context because they have been found to be the right type of commerce for s-commerce (Shanmugam & Jusoh, 2014). Our results offer insights for online firm managers and SNS-based commerce owners on how to manage customer satisfaction and the perceived usefulness of SNS-based commerce by emphasising the SQ role beyond the s-commerce context.

The theoretical background of the study is provided in the following section. The methodology section presents our research model, hypotheses, and method. Sections 4 and 5 offer data analysis results and discussion. Finally, the conclusion addresses the implications and limitations of the study.

Literature review and background

IS success model

Many studies have adopted, adapted, and extended the IS success model to measure e-commerce success. Because of the amount of discussion on the issue, DeLone and McLean (2003) refined and updated the previous model to reflect dramatic changes in IS practice, especially the advent and explosive growth of e-commerce (DeLone & McLean, 2003). One refinement was adding SQ to the quality dimension to measure the

intention-to-use, use, and user satisfaction. DeLone and McLean (2003; 2004) argued that SQ is important in an e-commerce environment because the users are customers; therefore, providing good quality support will lead to more customers and more sales. They also added a net benefits dimension to replace the individual and organisation impacts dimension because they judged that the effect or benefit depends on the purpose of evaluating the system.

One of the issues with the IS success model is its use and intention-to-use dimensions. Some researchers (e.g. Ahn, Ryu, & Han, 2004; Brown & Jayakody, 2008) have replaced them with a perceived usefulness dimension, reasoning that high perceived usefulness will lead to customer satisfaction with e-commerce systems. Some have argued that the use dimension represents behaviour, making it appropriate for process models, whereas the perceived usefulness dimension represents an attitude, making it appropriate for causal models (Seddon & Kiew, 1997). Furthermore, the perceived usefulness dimension is appropriate when considering an attitude derived from perceptions of past IS use (Rai, Lang, & Welker, 2002). S-commerce is a subset of e-commerce (Liang & Turban, 2011) and SNS-based commerce is a specific application of s-commerce. Therefore, the IS model can reasonably be adapted and used to study SNS-based commerce.

SQ-SERVQUAL

In the e-commerce environment, an information system provides not only information but also service or support to its customers. Therefore, DeLone and McLean (2003) added an SQ dimension to the quality dimension of the IS success model. Generally, SQ is defined as overall support delivered by the service providers (DeLone & McLean, 2003; Saravanan & Rao, 2007; Sousa & Voss, 2012). In the context of e-commerce, SQ is defined as the overall support delivered by the e-commerce service provider (Brown & Jayakody, 2008). Customer satisfaction is affected by the level of support and service provided through e-commerce systems (Ahn et al., 2004; Brown & Jayakody, 2008), and SQ also affects perceived usefulness (Ahn et al., 2004). Parasuraman, Zeithaml, and Malholtra (2005) claimed that SQ is essential to improving customer satisfaction, which agrees with Ladhari's (2010) assertion that SQ, particularly online SQ, significantly influences many aspects of e-commerce (e.g. perceived value, trust, and satisfaction). Since adopting the SQ dimension to the IS context, researchers have primarily used the SERVQUAL instruments (tangible, assurance, empathy, responsiveness, and reliability) (Parasuraman, Zeithaml, & Berry, 1988), originally developed to measure SQ in marketing (Pitt et al., 1995). DeLone and McLean (2003) adapted the work of Pitt et al. (1995) to get the determinants of the SQ dimension in their IS success model. SERVQUAL has since been revised, and new SQ scales have been introduced (e.g. WebQual, SiteQual, e-SQ) to measure e-commerce (Setó-Pamies, 2012) because the original SEVRQUAL could not embrace the unique facts of e-commerce (e.g. limited face-to face and direct interaction with a website) (Parasuraman et al., 2005). With adequate modifications, however, SERVQUAL can measure e-commerce. It is, particularly well-suited for s-commerce and SNS-based commerce, because it measures SQ using direct interaction (face-to-face communication) between customers and sellers/employees (Huang & Benyoucef, 2013). We eliminate *tangible* (Ganguli & Roy, 2013) because, from the customer perspective, *tangible*, which deals with hardware and software systems, is not applicable to the s-commerce context in which customers focus on the services provided and supported by the system rather than on the system itself.

Ladhari (2010) found that among the various determinants of SQ, reliability and responsiveness are the most important. Although some have argued that the SQ determinant *empathy* is less important for e-commerce because the online environment lacks personal human interaction (van Iwaarden, van der Wiele, Ball, & Millen, 2003; Ladhari, 2010), SNS-based commerce supports real communication and interaction, which means empathy is both possible and relevant (Lin, 2007; Li & Suomi, 2009; Chen et al., 2013). Some previous studies have replaced the assurance SQ measure in SERVQUAL with trust (Lee & Lin, 2005; Behjati, Nahich, & Othaman, 2012) or security and privacy (Li & Suomi, 2009; Behjati et al., 2012; Du, Lu, Wu, Li, & Li, 2013; Rahman & Abu Zarim, 2014). However, assurance covers courtesy and the ability of the system to inspire trust and confidence. van Iwaarden et al. (2003) further explain that assurance is derived from the security and privacy of the system. Therefore, in the context of e-commerce, some studies (Siadat, Buyut, & Selamat, 2008; Kassim & Asiah Abdullah, 2010) have kept assurance as a determinant of SQ.

Conceptual definitions in this study

In this study, we provide operational definitions of SQ determinants' effects on perceived usefulness and customer satisfaction, which go on to affect perceptions of the net benefits of SNS-based commerce. The constructs have been measured in the previous studies and modified to construct the present research model. Assurance is the knowledge and courtesy expressed in SNS-based commerce and its ability to convey confidence and trust in online shopping. It includes security and privacy. Empathy is the ability of SNS-based commerce to show care and individualised attention to its customers. Responsiveness is the readiness and quickness of SNS-based commerce to provide service, pay special attention, and offer prompt and accurate service estimations. Reliability means the SNS-based commerce is correct, useful, and dependable in providing services to customers in an accurate and timely manner. Perceived usefulness is the degree to which customers believe that using SNS-based commerce can improve the way they complete their online shopping activities. Customer satisfaction is the degree of customer responses to their commerce experience conducted through SNS. Finally, net benefits are the extent to which SNS-based commerce contributes to the success of customers.

Research methods and data

Hypothesis development

The hypothesised relationships among constructs are based on theoretical work on the IS success model (DeLone & McLean, 2003; 2004). However, rather than testing the relationship of determinants with overall SQ, we test the relationship between each identified SQ determinant as found in SERVQUAL and perceived usefulness and customer satisfaction. The detailed explanation for each hypothesis is as follows.

Assurance – Ability of SNS-based commerce to provide good security and privacy conveys trust and confidence to the customer using it. Therefore, assurance covers the aspects of trust, confidence, security, and privacy (van Iwaarden et al., 2003; Siadat et al., 2008). Customers need to be confident and trust a service before they start using it and experience a purchase (Kassim & Abdullah, 2010). Therefore, perceived usefulness and customer satisfaction are associated with assurance such that a high level of customer trust and confidence in the system will lead to a high level of

perceived usefulness and customer satisfaction (Ladhari, 2010). Hence, we propose the following hypotheses:

H1a: Assurance has a positive effect on the perceived usefulness of SNS-based commerce.

H1b: Assurance has a positive effect on customer satisfaction with SNS-based commerce.

Empathy – Empathy happens during interactions and communication between an online seller and customers (Chen et al., 2013). However, in the case of SNS-based commerce, communication and interaction occur not only between customers and the seller but also among customers. This communication and interaction happen in a way that is similar to face-to-face communications through the social support tools embedded in any SNS. Therefore, insofar as an SNS-based communication medium can convey individual attention, a good means of communication and convenient hours play an important role in influencing perceived usefulness and customer satisfaction (van Iwaarden et al., 2003). Paying relatively little attention to customers will lead to customer dissatisfaction. Therefore, we hypothesise:

H2a: Empathy has a positive effect on the perceived usefulness of SNS-based commerce.

H2b: Empathy has a positive effect on customer satisfaction with SNS-based commerce.

Responsiveness – Responsiveness addresses the ability and willingness to provide prompt service when customers need assistance and help during online shopping (Kassim & Abdullah, 2010). Customers perceive SNS-based commerce to be useful if the online seller provides them with fast and helpful responses to their questions and problems, reducing wait times (van Iwaarden et al., 2003; Li & Suomi, 2009). Consequently, responsiveness leads to customer satisfaction. Customers will be frustrated and disappointed when they have to wait for a long time or if the response they get does not solve their problem. Other studies (Lee & Lin, 2005; Lin, 2007; Behjati et al., 2012) also found that responsiveness significantly affects satisfaction. We suggest the following hypotheses:

H3a: Responsiveness has a positive effect on the perceived usefulness of SNS-based commerce.

H3b: Responsiveness has a positive effect on customer satisfaction with SNS-based commerce.

Reliability – Reliability refers to the technical efficiency of SNS-based commerce, such as delivering products as promised, providing up-to-date and accurate information, and maintaining privacy (van Iwaarden et al., 2003; Li & Suomi, 2009). It can be summarised as the consistency and credibility of the online seller in providing services. Reliability is an SQ element that leads to customer satisfaction (Lee & Lin, 2005; Behjati et al., 2012; Du et al., 2013) or dissatisfaction (Kassim & Abdullah, 2010). Once a customer has recognised the consistency and credibility of a service provided, s/he perceives the system to be useful and might be satisfied with it; otherwise the customer will be disappointed and might stop using the system. Therefore, we hypothesise:

H4a: Reliability has a positive effect on the perceived usefulness of SNS-based commerce.

H4b: Reliability has a positive effect on customer satisfaction with SNS-based commerce.

Perceived usefulness, customer satisfaction, and net benefits – Perceived usefulness is an important determinant that affects customer decisions to use SNS-based commerce. If customers do not perceive SNS-based commerce to be useful, they might not use the system, and would consequently not be satisfied with it (Brown & Jayakody, 2008; Du et al.,

2013). Therefore, the highest level of perceived usefulness of the system leads to customer satisfaction (Brown & Jayakody, 2008). Customer satisfaction is an important determinant in measuring a customer's opinion of any e-commerce system (DeLone & McLean, 2004; Brown & Jayakody, 2008). Both customer satisfaction and perceived usefulness are positively associated with a system's benefits, as shown by Petter, DeLone, and McLean (2008), who claimed that on the individual level of analysis, usefulness and user satisfaction have moderate to strong support in net benefits. In addition, Ghobakhloo et al. (2014) found that customer satisfaction with a B2C e-commerce system led managers or commerce owners to improve and enhance their system usefulness, which gradually increased the net benefits of the system, such as improved shopping activities, improved decision making, saving money and time, and having better product and service choices. Thus, we hypothesise:

H5: Perceived usefulness has a positive effect on customer satisfaction with SNS-based commerce.

H6: Perceived usefulness has a positive effect on the net benefits of SNS-based commerce.

H7: Customer satisfaction has a positive effect on the net benefits of SNS-based commerce.

Research model

We formulated the research model of this study based on the updated IS success model by DeLone and McLean (2003), emphasising the effects of SQ determinants on perceived usefulness and customer satisfaction. We chose customer satisfaction after considering customer e-commerce satisfaction as described by Molla and Licker (2001). Our concern is to measure the attitude rather than behaviour. Therefore, we used perceived usefulness rather than the use construct after considering the research of Ahn et al. (2004) and Brown and Jayakody (2008). We replaced the simultaneous causality between 'perceived usefulness and net benefits' and 'customer satisfaction and net benefits' in DeLone and McLean (2003, 2004) with a one-way causality with argument: customers gain benefits only when they are satisfied and perceive the SNS-based system to be useful after using and experiencing the system, not vice versa (Seddon & Kiew, 1997; Ghobakhloo et al., 2014). Thus, we define net benefits as the real benefits gained by customers after completing their online shopping activities. This is in accordance with our study respondents, who all had online shopping experience using SNS-based commerce. Furthermore, we set net

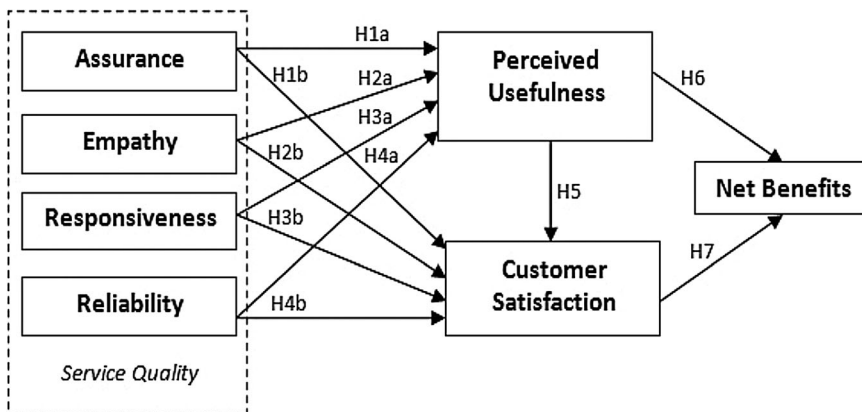


Figure 1. Research model.

benefits as the key success of SNS-based commerce. Therefore, SNS-based commerce contributes to customer success in performing online commerce activities. The research model underlying this study is shown in [Figure 1](#).

Data collection and analysis

We collected data through an online survey. We published the questionnaire via SNS to reach our sample; people with online shopping experience via SNS were determined to be the optimal target for this study. The data gathering period was from 2015/1/10 to 2015/1/31. We received a total of 290 responses, and after removing incomplete and duplicate responses, we included a total of 249 responses in the sample for further analysis. The questionnaire contained three main parts. The measurement items were derived from previous studies.

We used the questionnaire answers, given on a 7-point Likert scale ranging from 'strongly disagree' (1) to 'strongly agree' (7). We used 22 items to measure the seven constructs. We set assurance, empathy, responsiveness, reliability, perceived usefulness, and customer satisfaction as independent variables and net benefits as the dependent variable. We used confirmatory factor analysis (CFA) to examine the convergent and discriminant validity and structural equation modelling (SEM) to test the research model and hypotheses. Both CFA and SEM were performed using IBM SPSS AMOS version 21. The items for each construct are presented in the [appendix](#).

Results

Demographic characteristics

All of the 249 respondents in this study were from Malaysia and had an online shopping experience via SNS. One hundred and fifty-three of the respondents had shopping experiences using only Facebook; 43 respondents using Facebook and Instagram; 10 respondents using only Instagram; 7 respondents using Facebook and Twitter; 3 respondents using Facebook, Instagram, and Twitter; 2 using only Twitter; and 31 respondents using other SNS accounts. The majority of the respondents (69.9%) spent 2–7 hours a day on SNS, and all respondents were familiar with SNS-based commerce. [Table 1](#) shows the demographic characteristics of the sample.

Convergent and discriminant validity

We used CFA to examine the convergence of the measurement items by factor loading, composite reliability (CR), and average variance extracted (AVE). The overall model fit indices are $p = .000$, $\chi^2 = 223.43$, $df = 114$, $\chi^2/df = 1.96$, $GFI = 0.91$, $AGFI = 0.87$, $CFI = 0.97$, and $RMSEA = 0.06$. CFA showed a good fit for the measurement model, meaning that the measurement model exhibited a fairly good fit with the data collected. The results for convergent validity are shown in [Table 2](#). All the items in each construct ranged from 0.80 to 0.90, with the CR for each construct exceeding the recommended level of 0.70 (Hair, Black, Babin, Anderson, & Tatham, 2006). The average AVE ranged from 0.71 to 0.76, which also exceeds the recommended level of 0.50 (Hair et al., 2006). Therefore, we conclude that the scales have sufficient convergent validity.

We examined discriminant validity by comparing the correlation between the constructs with the square root of the AVE of each individual construct. The results for discriminant validity in [Table 3](#) show that the values for each construct exceeded the off-diagonal correlations between the constructs, implying adequate discriminant validity for the constructs.

Table 1. Demographic characteristics of the sample.

Demographic variable	Sample composition (<i>n</i> = 249)	
	<i>n</i>	%
<i>Gender</i>		
Male	102	41.0
Female	147	59.0
<i>Age</i>		
20–29 years old	198	79.5
30–39 years old	47	18.9
40–49 years old	4	1.6
<i>Education</i>		
High school	19	7.6
Diploma	27	10.8
Bachelor's degree	177	71.1
Master's degree	22	8.8
PhD degree	4	1.7
<i>Employment</i>		
Private sector	99	39.8
Public sector	48	19.3
Self-employed	23	9.2
Student	68	27.3
Unemployed	11	4.4
<i>Income (Yearly)</i>		
Less than MYR (Malaysia ringgit) 1500		
MYR 1500–MYR 2999	107	43.0
MYR 3000–MYR 4999	80	32.1
MYR 5000–MYR 6999	37	14.9
MYR 7000–MYR 8999	12	4.8
More than MYR 9000	5	2.0
	8	3.2

Structural model analysis results

We used SEM to test the structural model and hypotheses. We evaluated the model using the χ^2 , GFI, AGFI, CFI, and RMSEA because of their stability and lack of sensitivity to sample size (Hair et al., 2006). The model was significant at the $p < .05$ level, and the overall fit indices ($\chi^2 = 9.49$, $df = 4$, $\chi^2/df = 2.37$, GFI = 0.98, AGFI = 0.92, CFI = 0.99, and RMSEA = 0.07) indicate that the model has a good fit. The GFI, AGFI, CFI, and RMSEA values surpassed the recommended levels (Hair et al., 2006). The model analysis result is presented in Figure 2. The hypotheses analysis results show that assurance ($\beta = 0.12$, $t = 2.11^*$), responsiveness ($\beta = 0.17$, $t = 2.11^*$), and reliability ($\beta = 0.21$, $t = 2.10^*$) have a positive impact on perceived usefulness. Thus, H1a, H3a, and H4a are supported. Responsiveness ($\beta = 0.15$, $t = 2.12^*$) and empathy ($\beta = 0.16$, $t = 2.00^*$) have a positive effect on customer satisfaction. Hence, H2b and H3b are supported. However, at the level $p < 0.05$, H2a is rejected, indicating that empathy ($\beta = 0.07$) has no significant effect on perceived usefulness, and H1b and H4b are rejected, indicating that assurance ($\beta = 0.02$) and reliability ($\beta = 0.01$) have no significant effect on customer satisfaction. Perceived usefulness has a significant effect on customer satisfaction ($\beta = 0.52$, $t = 9.42^{***}$), and both perceived usefulness ($\beta = 0.40$, $t = 8.10^{***}$) and customer satisfaction ($\beta = 0.51$, $t = 10.42^{***}$) significantly affect the net benefits of SNS-based commerce.

Table 2. Convergent validity test.

Items	AS	EM	RS	RB	PU	CS	NB	CR	AVE
AS1AS2AS3	0.870.900.80							0.90	0.74
EM4EM5EM6		0.850.860.90						0.90	0.76
RS7RS8RS9			0.800.890.88					0.89	0.73
RB10RB11				0.850.87				0.85	0.74
PU13PU14					0.830.87			0.83	0.71
CS16CS17						0.860.86		0.86	0.75
NB19NB20							0.830.88	0.84	0.72

Note: AS, Assurance; EM, Empathy; RS, Responsiveness; RB, Reliability; PU, Perceived usefulness; CS, Customer satisfaction, and NB, Net benefits.

Table 3. Discriminant validity test.

Constructs	1	2	3	4	5	6	7
(1) Assurance	0.86						
(2) Empathy	0.79	0.87					
(3) Responsiveness	0.78	0.85	0.86				
(4) Reliability	0.76	0.76	0.85	0.86			
(5) Perceived usefulness	0.61	0.61	0.65	0.63	0.84		
(6) Customer satisfaction	0.57	0.63	0.66	0.60	0.73	0.86	
(7) Net benefits	0.63	0.63	0.63	0.62	0.78	0.80	0.85

Note: Values in bold type indicate the square root of the AVE.

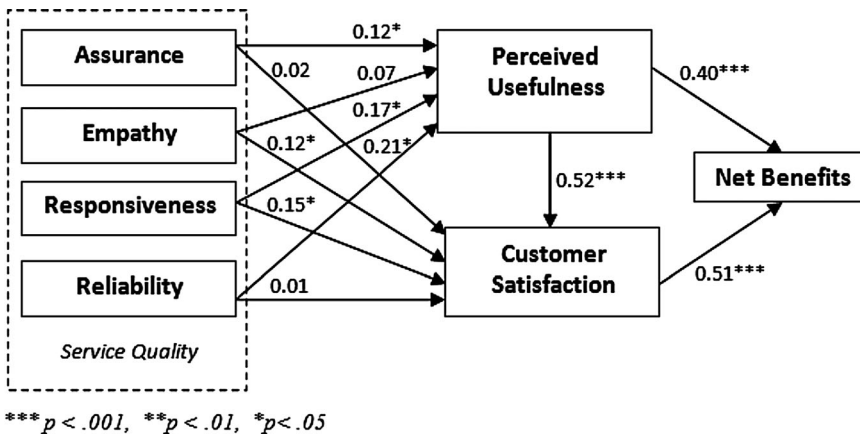


Figure 2. Result of structural modelling.

Discussion

The SQ dimensions of assurance, responsiveness, and reliability, which were identified as SERVQUAL measures in previous studies and had proven to be significant determinants in IS and e-commerce, maintain a statistically significant effect on perceived usefulness. In addition, responsiveness and empathy have a statistically significant effect on customer satisfaction with SNS-based commerce, and thus eventually have positive effects on the net benefits of SNS-based commerce. On the other hand, we found that empathy does not affect perceived usefulness, and assurance and reliability have no significant effect on customer satisfaction with SNS-based commerce.

Our findings indicate that responsiveness is the main key determinant of SQ, positively affecting both perceived usefulness and customer satisfaction. This result validates Ladhari's (2010) findings and is consistent with the findings of other prior research (e.g. Behjati et al., 2012; Du et al., 2013) on satisfaction with and the usefulness of e-commerce. Our findings suggest that customers expect high responsiveness (prompt responses and actions) from SNS-based commerce regarding their requests, complaints, and problems.

Assurance and reliability have a significant positive effect on perceived usefulness but not on customer satisfaction. Those findings are slightly inconsistent with the findings of several prior researchers (e.g. Behjati et al., 2012; Rahman & Abu Zarim, 2014). Assurance, which is related to trust and security, was found to affect customer satisfaction in previous studies but not in our study, implying that Malaysian users still doubt the

trustworthiness and security of SNS-based commerce. This is in accordance with Wong (2014), who claimed that Malaysian SNS users are reluctant to engage in online shopping because of security and trust concerns. We found reliability to positively affect perceived usefulness, suggesting that SNS-based commerce is perceived useful enough to provide accurate and timely information, but the effect was not strong enough to affect customer satisfaction. One possible explanation could be that Malaysians continue to resist internet technology adoption due to lack of awareness, knowledge, and experience (Khan, Dominic, & Khan, 2009).

Interestingly, previous studies have claimed that empathy is not an important SQ determinant in e-commerce. For example, van Iwaarden et al. (2003) and Siadat et al. (2008) discovered that empathy has the lowest SERVQUAL rank in an e-commerce-related context, and Lee and Lin (2005) and Lin (2007) found that empathy and personalisation (which is related to empathy) have no significant effect on e-commerce satisfaction. However, our results reveal that empathy has no significant effect on perceived usefulness, implying that communication matters more than the communication platform itself. In other words, a good and advanced communication platform does not guarantee good communication. However, our results show that empathy does have a positive effect on customer satisfaction with SNS-based commerce. Empathy requires two-way communications (Chen et al., 2013), implying that how customers perceive SNS-based commerce might be affected by the communication. If a customer is happy with the communication, s/he will communicate comfortably and be satisfied with the system. Therefore, our result conveys that SNS-based commerce successfully acts as a communication and interaction platform for customers, implying that good communication and interaction between customers and sellers and among SNS members can exist during commerce-related activities.

Additionally, consistent with previous studies (DeLone & McLean, 2004; Petter et al., 2008; Brown & Jayakody, 2008; Ghobakhloo et al., 2014), we found a positive relationship among perceived usefulness, customer satisfaction, and net benefits in SNS-based commerce. Those findings imply that customers gain benefits from using SNS-based commerce as they are satisfied and perceive the system to be useful.

Conclusion

Over the years, Malaysia has shown increased use of SNS in online commerce. By adapting the IS success model and combining it with SERVQUAL (Pitt et al., 1995), we examined the effects of SQ determinants on SNS-based commerce in Malaysia because SQ is an important factor in e-commerce success (DeLone & McLean, 2004; Brown & Jayakody, 2008; Fang et al., 2011). We derived the SQ determinants from SERVQUAL. Our results show that assurance, responsiveness, and reliability have a positive effect on perceived usefulness, and responsiveness and empathy have a positive effect on customer satisfaction. We found a significant relationship between perceived usefulness and customer satisfaction, both of which significantly affect perceptions of net benefit in SNS-based commerce. However, empathy has no significant effect on perceived usefulness, and assurance and reliability have no significant effect on customer satisfaction with SNS-based commerce.

The main contribution of this study is providing an important foundation for understanding the SQ dimension in SNS-based commerce beyond s-commerce. The literature on the formal relationships among SQ, perceived usefulness, customer satisfaction, and a system's net benefit is quite limited in the case of each SQ determinant's individual effect in s-commerce, particularly when discussing SNS-based commerce. Thus, this

study provides wider coverage of the SQ dimension and its determinants and their effects on perceived usefulness and customer satisfaction, which lead to the net benefits of a system. Consequently, our study will help owners assess their current stage of SNS-based commerce to determine where to focus for further improvement.

Because this study examines and identifies the key dimensions affecting SNS-based commerce, especially perceived usefulness and customer satisfaction, by adapting the IS success model and incorporating SERVQUAL, this study sheds light on the application of the theories. Some researchers have stated that with adequate modification, SERVQUAL can be an applicable measure to e-commerce (e.g. van Iwaarden et al., 2003; Siadat et al., 2008). Our findings validate and confirm that by adequately modifying SERVQUAL and merging it with the IS success model, SERVQUAL is still a relevant measure for s-commerce, particularly SNS-based commerce. Thus, we provide empirical evidence to validate and confirm previous studies (van Iwaarden et al., 2003; Siadat et al., 2008). Many discussions on the use of the IS success model in e-commerce reveal that SQ is an important dimension of e-commerce success through its positive relationship with perceived usefulness and customer satisfaction. However, few researchers have discussed s-commerce, especially with an emphasis on the effects of various SQ determinants. Our approach offers a deep understanding of how SQ affects perceived usefulness and customer satisfaction in SNS-based commerce.

One of our purposes was to provide some standpoint for IT managers or SNS-based commerce owners to frame and develop effective strategies for SNS-based commerce by focusing on SQ aspects. SQ is a key determinant of perceived usefulness and customer satisfaction, which means that the benefits a customer gains through using the system (which lead them to stay and continue to use the system) are derived from the usefulness and customer satisfaction offered by the system. Based on our findings, managers or owners can focus on enhancing and improving the SQ of SNS-based commerce. In that process, responsiveness is essential; our results show that responsiveness is the primary SQ determinant. Thus, managers or owners should continually monitor and refine the responsiveness of SNS-based commerce. For example, some systems are not available around the clock; therefore, customers must be made aware of that, perhaps by publishing operation times on the SNS and offering directions on how to contact service personnel during the offline period (Li & Suomi, 2009; Du et al., 2013). In addition, IT managers and SNS-based commerce owners can improve and enhance other SQ determinants. (i) Assurance covers the ability of a system to convey confidence and trust related to security and privacy. Hence, IT managers or SNS-based commerce owners should have a clear security policy (Lee & Lin, 2005; Li & Suomi, 2009), particularly on how customer information privacy is managed. The policy should be clearly posted and easy for customers to understand. (ii) Managers and owners should improve reliability by giving customers exactly what they have been promised as soon as the customers have paid and by always providing official notifications about system conditions (Du et al., 2013). (iii) For empathy, IT managers and SNS-based commerce owners must ensure that they are consistently courteous, have good personal attention, and address complaints cheerfully (Li & Suomi, 2009; Siadat et al., 2008). This can be accomplished by using polite and easy-to-understand language in online communications.

Although this study provides meaningful implications and contributions, it has some limitations. First, our sample is from Malaysia; therefore, generalizability to other countries might be limited. Second, we found many SQ determinants in the literature; however, we chose only four of them derived from SERVQUAL that we believed to be crucial for SNS-based commerce. Third, we focused on C2C and B2C e-commerce domains, which

make it difficult to generalise our results to other e-commerce domains. Further research should consider those limitations to provide better understanding of this topic.

Disclosure statement

No potential conflict of interest was reported by the authors.

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Appendix: Questionnaire items for each construct

Construct	Items
Assurance	AS1 This SNS instils confidence in me to do my shopping activities AS2 This SNS is consistently courteous with me AS3 I feel safe doing my transaction with this SNS
Empathy	EM4 This SNS gives individual attention EM5 This SNS gives users personal attention EM6 This SNS has my best interest at heart
Responsiveness	RS7 This SNS tells users exactly when service will be performed RS8 This SNS is always willing to help RS9 This SNS is never too busy to respond to my request
Reliability	RB10 When I have a problem, this SNS shows sincere interest in solving it RB11 This SNS provides its services at the time it promised to do so RB12 This SNS always accomplishes whatever it promised to do*
Perceived usefulness	PU13 This SNS enhances the productivity of my shopping activities PU14 This SNS improves my shopping performance PU15 This SNS make it easier to do shopping activities*
Customer satisfaction	CS16 I obtain exactly what I need from this SNS CS17 I am satisfied with using this SNS for my shopping activities CS18 I am pleased with using this SNS for my shopping activities*
Net benefits	NB19 This SNS helps me save money NB20 This SNS helps me save time NB21 This SNS helps me achieve my shopping goals* NB22 This SNS provides me with better products and services* *Dropped from the final analysis