

# Measuring Service Quality in M-commerce Context: A Conceptual Model

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**Abstract-** Due to the scant research in the area of m-commerce service quality, this study proposes a model for measuring the service quality of m-commerce in a commercial environment. In this study, a comprehensive analysis of the literature in the area of marketing, service quality (SQ), and information systems service quality was carried out to identify the inter-related factors that lead to the service quality of m-commerce. The various past measurement models of electronic service quality (e-SQ) were also reviewed. It was found that overall perceived service quality is determined by three dimensions, which are service quality, information quality, and system quality. The overall service quality will have an impact on customer satisfaction, which will then affect the customer behavioral intention. The study provides insights to researchers and practitioners in the area of m-commerce on the important inter-related dimensions and determinants for measuring service quality. The proposed m-commerce service quality model was developed by revising and modifying the SERVQUAL scale.

**Index Terms-** m-commerce, e-service quality, m-commerce service quality, e-service quality measurement, e-service quality factors.

## I. INTRODUCTION

Information Technology (IT) has brought about many changes in the world, including in the industrial and service sectors. Most businesses nowadays depend on IT to manage their operations and develop products, as well as improve machinery, automation, and other processes involved in production (Ombati, Magutu, Nyamwange, & Nyaoga, 2010). Closely related to IT is the role of the Internet, which is evolving very rapidly. Many commercial activities, like sale of goods and services, are now conducted via the Internet. This is called Electronic commerce (e-commerce). However, e-commerce much depends on the availability of a wired network connection to the Internet. The limitation of wired technology is the lack of mobility, meaning that customers cannot enjoy the luxury of access at anytime and from anywhere; wireless technologies, however, have this advantage. Mobile technologies are not necessary to increase mobility, but they could reduce consumer need to travel about (Mallat, Rossi, Tuunainen, & Oorni, 2009). Moreover, consumers can quickly find out about a company's resources and services from anywhere and whenever they want (Suki, 2011). The buzzword is m-commerce (Sadi & Noordin, 2011). With this fast evolving trend, users of mobile devices are being looked upon as a large group of potential customers (Aungst & Wilson, 2005).

M-commerce studies can be categorized into technology and services, and cover issues such as small screens and multifunctional keypads, reduced power of computation, memory and disk capacity, shorter battery life, complicated mechanisms for text input, data storage and higher risk transaction errors, lower display resolution, less surfability, user unfriendly interfaces, unreliable network connections, and graphical limitations (Lu & Su, 2009; Siau, Lim, & Shen, 2001). Moreover, studies in m-commerce services mostly focus on providing customers and users with access to purchases on websites, including electronic flight tickets, and other modes of transportation, bank services, peer-to-peer payments, and parking fees payment, which are among the potential applications (Anckar & D'Incau, 2002; Herzberg, 2003; Kim, Mirusmonov & Lee, 2010; Mallat, Rossi, Tuunainen, & Öörni, 2009; Masterson, & Wei, 2005; Stafford & Gillenson, 2003). It is expected that customers' satisfaction with m-commerce services can be achieved through providing a high quality service. Since there seems to be a lack of studies in the m-commerce area, the researcher is motivated to find out what factors enable a high quality m-commerce service in the commercial environment.

Another important aspect in m-commerce, as in all other service sectors, is service quality (Lu, Zhang, & Wang, 2009; Turel & Serenko 2006). This is because quality services can fulfill customer needs (Dedeke, 2003). Service quality can impact a customer's behavioral intention and, eventually, intention to purchase, making it vital for successful business competition, both for the provider of the service and manufacturers (Bolton & Drew, 1991; Parasurman et al., 1988, 1991; Parasurman et al., 1994; Zeithaml et al., 1996). In Information and Communications Technology (ICT) service-quality field, researchers (e.g. Berry et al., 1994; Jiang et al., 2000; Kettinger & Lee, 1997; Pitt et al., 1995) have suggested five dimensions for measuring quality, which are: 1) tangibles, encompassing facilities, equipment, and personnel appearance; 2) reliability – the service must be able to deliver what it promises, accurately; 3) responsiveness, measured by the willingness to help end-users promptly; 4) assurance, referring to the employees' knowledge and politeness and also their ability to gain the confidence and trust of customers; and 5) empathy – individual attention and care given to end-users by the service provider.

Previous research on ICT service quality can help in the understanding of m-commerce service quality. The mobile device is not merely a communication tool but has increasingly become a tool for online commerce. Hence, it is crucial that the service providers understand the consumers' perception of m-commerce quality and undertake measures to ensure continued provision of service quality for m-commerce users (Lu, Zhang &

Wang, 2009). Nevertheless, there is scant research in the area of m-commerce service quality. Therefore, there is an increasing need to focus on the factors that can ensure the service quality of m-commerce (Lu, Zhang, & Wang, 2009; Turel & Serenko 2006). In addition, a number of researchers (e.g. Lu, Zhang, & Wang, 2009; Turel & Serenko 2006) asserted that it is necessary to explore service quality, customer satisfaction, and customer behavioral intentions and their inter-relationship in using m-commerce services in future. Such a study would benefit vendors, providers, and researchers in services technology in their attempts to measure customers' satisfaction and to understand its underlying dimensions. It will also enable service providers to benchmark their performance and identify areas that require improvement to ensure continuous usage of the available m-commerce services.

This study proposes a service quality model for m-commerce in a commercial environment. A comprehensive analysis of the literature in the area of marketing, service quality (SQ), and information systems service quality was carried out to identify the inter-related factors that lead to the service quality of m-commerce in a commercial environment. The various past measurement models of electronic service quality (e-SQ) are also reviewed. Dependent and independent variables as well as their potential relationship are also identified from the literature analysis to form the conceptual model.

## II. THEORETICAL BACKGROUND

### 2.1 Conceptualization of Service Quality

Service Quality (SQ) is a critical factor and noted lately as the measure of effectiveness and efficiency in organizational performance. It has also become an important part of the discourse on the web among academics and practitioners, especially those in the service marketing areas (Jensen & Markland, 1996). Many service organizations seek profitable ways to differentiate themselves from other organizations and gain a lasting competitive advantage by improving relative SQ. Therefore, an organization providing higher quality of service can have higher market share and higher returns on investment and, finally, can gain long-term profitability (Buzzell & Gale, 1987; Ghobadian, Speller, & Jones, 1994; Margolies, 1988). Accordingly, it is pertinent for practitioners and academics to be informed about SQ, in terms of its definition and measurement (Asubonteng et al., 1996). In the modern marketing literature, most definitions of quality have focused on consumer perceptions of service, product excellence, and satisfaction of consumer requirements (Ghobadian et al., 1994; Gronroos, 1982; Parasuraman et al., 1985, 1988). From this perspective, perceived SQ has been defined as "a global judgment, or attitude, relating to the superiority of the service" (Parasuraman et al., 1988), and as "the consumer's overall impression of the inferiority/superiority of the organization and its service" (Bitner & Hubbert, 1994). Generally, perceived SQ is seen as the resulting direction and degree from comparing actual perceptions of service performance with consumer expectations (Parasuraman et al., 1988; Zeithaml, Parasuraman, & Berry, 1990). Parasuraman et al. (1988) defined consumer expectation using the SQ perspective as: "desires or wants of consumers, what they feel a service provider should offer rather than would

offer". Most SQ research has been based on product satisfaction, especially on the disconfirmation paradigm. This paradigm has been used to evaluate the level of consumer satisfaction with the chosen product or service, and is operationalized in terms of the comparison between consumer expectation and perceived performance of the product or service.

On the basis of the disconfirmation paradigm, Parasuraman et al. (1988) developed SERVQUAL as an instrument used for the measurement of consumer perception of overall SQ. Five dimensions of SQ were identified: 1) tangibles; 2) reliability; 3) responsiveness; 4) assurance; and 5) empathy. The SERVQUAL instrument has been vastly utilized and applied as a global scale in measuring the perceived SQ for a variety of service industries, with both managers and academics (Babakus & Boller, 1992; Crompton & MacKay, 1989; Cronin & Taylor, 1992; Johnson, Dotson, & Dunlap, 1988; Webster, 1989; Woodside et al., 1989). Nevertheless, later researches in some service settings suggested that the SERVQUAL instrument is inappropriate for the measurement of SQ across industries (Asubonteng et al., 1996; Babakus & Boller, 1992; Bolton & Drew, 1991; Bowers, Swan, & Koehler, 1994; Brown, Churchill, & Peter, 1993; Buttle, 1996; Carman, 1990; Cronin & Taylor, 1992; Finn & Lamb, 1991; McAlexander et al., 1994; McDougall & Levesque, 1995; Rowley, 1996).

### 1.2 Conceptual Foundations of Electronic Service Quality (E-SQ)

From the fields of marketing and information systems, the theories used to explain web SQ can be drawn. These theories are related to attitude, such as Attribution Theory (Heider, 1958), Expectancy-Value Theories, Learning Theories (Fishbein, 1963), and the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975). TRA holds that when behavior is viewed as positive (attitude), and there is preference for others' belief in the performance of the behavior (subjective norm), the intention (motivation) will be greater in instilling a behavior in such a way that there is more possibility to act.

The terms website SQ and online SQ have been used interchangeably by researchers (Aladwanian & Palvia, 2002; Lee & Lin, 2005; Piccoli et al., 2004; Riel et al., 2001; Zeithaml, 2002). As one of the pioneers who introduced the concept of e-SQ, and examined the SQ of websites as well as their role in SQ delivery to customers, Zeithaml (2002) defined e-SQ and website SQ as "the extent to which a website facilitates efficient and effective shopping, purchasing and delivery of products and services". Based on this definition, the quality of a website is to provide sufficient service to customers to shop comfortably and confidently, and to expect fast delivery and reliable service. In order to achieve this, companies should understand clearly customers' perceptions of SQ (Zeithaml et al., 2002).

The dimensions of E-SQ determined by previous researchers, including Gounaris and Dimitriad (2003), Novak et al. (2000), and Loiacono et al. (2002), have their origin in the Technology Acceptance Model (TAM) theory developed by Davis (1989). Davis defined perceived technology ease of use as "the degree to which the prospective user expects the target system to be free of effort". He further perceived technology usefulness as "the degree to which a person believes that using a particular system would enhance his or her job performance".

These dimensions can help companies to predict the behavior of consumers when they decide to use a specific technology. It is argued that the ease of use of a particular system affects its adoption by customers (Davis, 1989; Davis et al., 1989; Legris et al., 2003). Zeithaml et al. (2002) described eight criteria used by customers when they evaluate e-SQ and the quality of websites. These criteria are: 1) Information availability, which can help consumers search for any relevant information on any products they are interested in enquiring about; 2) Ease of use/usability, which implies the easiness of using the web site, including downloading speed, design, and organization; 3) Privacy/security, this being the protection of personal information of customers such as hiding their personal information from other websites, shielding identity, and offering informed consent. As far as security is concerned, it refers to protecting users from the risk of fraud and financial loss when they use their credit card or any other financial information. Security also concerns the provision of data confidentiality, security auditing, encryption, and anti-virus protection; 4) Graphic style refers to the attributes of a website in terms of choice of colors, size and type of the print, layout, graphics, photographs, 3D-effects animation, and multimedia; 5) Fulfillment/reliability relates to the company's actual performance, and not the website performance. It is defined as the ability to provide a product or service under agreed terms; 6) Access is the ability to reach quickly the company website; 7) Responsiveness is how quickly a company responds to customers; and 8) Personalization is the ability of the website to address customers' preferences by providing personalized and customized services. Zeithaml et al. (2002), in another exploratory study, categorized the criteria into four core and three recovery dimensions that are used in measuring the customers' perceptions of e-SQ. The core dimensions are the following: 1) Efficiency measures the ability of the customers to access the website and check any relevant information effectively with minimal effort; 2) Fulfillment is the company's actual performance in terms of service promise accuracy, the in-stock product availability, and delivery time; 3) Reliability refers to the accurate technical functioning and the service promises of the website; 4) Privacy defines the degree to which a company is able and willing to sustain the integrity of customer data. The main concern of the three recovery dimensions is with the problem that needs resolving and requires a "personal service". These recovery dimensions are: 1) Responsiveness – the ability of the company to provide processes that can easily solve problems; 2) Compensation – money-back guarantee, handling costs, and return of shipping; 3) Contact points – the ability of the company to offer live contact and real-time support for the customers through any communication means (online or otherwise). In the same vein, Parasuraman (2004) suggested that 11 criteria of e-SQ influence the perceptions of the customers about website quality and e-SQ. These criteria are: Ease of navigation, Access, Customization/personalization, Efficiency, Responsiveness, Security/privacy, Assurance/trust, Site aesthetics, Reliability, Knowledge on price, and Flexibility.

Cronin and Taylor (1992) examined the causal relationships between SQ, customer satisfaction, and behavioral intention, measuring each variable with one item. A total of 660 usable questionnaires were collected randomly for the examination of

the causal relationship between the three variables mentioned above. The questionnaires were from customers of four types of businesses in the south-eastern USA: banking, dry cleaning, pest control, and fast food. The correlation analysis result suggested that: 1) SQ is an antecedent of consumer satisfaction; 2) SQ has less effect on purchase intentions than does consumer satisfaction; and 3) consumer satisfaction has a significant effect on purchase intentions. Dabholkar et al. (2000) revealed that customer satisfaction is a strong mediating factor for the effect of SQ on behavioral intentions. The data used in their own study were systematically and randomly collected from 397 churches. A test of discriminant validity showed that the SQ's construct is not the same as the construct of customer satisfaction. The result of regression analysis done in structural equations modeling supports their proposition that customer satisfaction influences more behavioral intentions than SQ (Dabholkar et al., 2000).

The SQ literature indicated that perceptions of high SQ and high service satisfaction resulted in a high level of purchase intentions (Boulding et al., 1993; Cronin & Taylor, 1992; Taylor, 1997; Taylor & Baker, 1994; Zeithaml et al., 1996). Coner and Gungor (2002) argued that customer loyalty is affected by product quality, SQ, and retailer image. They also suggested that quality of product and service are directly related to customer satisfaction, leading to customer loyalty. The literature on customer satisfaction shows that the relationship between customer satisfaction and customer behavioral intention is dependent on the type of satisfaction. There is a strong positive impact on customer behavioral intention by satisfaction manifestation. This is also stronger than that of latent satisfaction on customer behavioral intention (Bloemer & Kasper, 1995; Bloemer & De Ruyter, 1995). Based on the results of the empirical studies, customers' SQ is one of the antecedents of satisfaction, in the sense that if there is SQ, there is a possibility for obtaining customer satisfaction (Anderson & Sullivan, 1993; Cronin & Taylor, 1992, 1994; Reidenbach & Sandifer-Smallwood, 1990; Spreng & Mackoy, 1996; Woodside, Frey, & Daly, 1989). This satisfaction can result in customer's loyalty intention to the service provider (Coner & Gungor, 2002; Cronin & Taylor, 1992, 1994; Dabholkar, Shepherd, & Thorpe, 2000).

### III. CONCEPTUAL RESEARCH MODEL

A broader examination of empirical literatures in the area of marketing, service quality (SQ), and information systems service quality brings the proposed conceptual model of this study to the fore. The various past measurement models of electronic service quality (e-SQ) are presented. Moreover, a broad outline of the underlying theoretical concepts is provided. This study found that m-commerce in an academic environment is a new area of research and it is very difficult to find related studies, supported by evidence, that focus on service quality, customer satisfaction, and their influences on customer behavior intentions in the m-commerce environment. However, similarities between mobile and e-services can be expected since both are Internet-based. In this research, much attention is paid to the measurement model of service quality in m-commerce based on the well-known SERVQUAL model. Many previous studies related to service quality suggest that it is necessary to add and modify items of the SERVQUAL scale, developed by Parasuraman et al. (1985,

1988), and to create a unique and comprehensive conceptual model of service quality, depending on the nature of the service sector under investigation (Carman, 1990; Cronin & Taylor, 1992; 1994; Finn & Lamb, 1991; Parasuraman & Grewal, 2000). Based upon this suggestion, the present study proposes a multi-dimensional model of service quality for m-commerce and outlines the relationships between service quality and other significant constructs. To understand and organize the m-commerce services quality in a structured manner, for theoretical purposes, it is organized by dimensions and sub dimensions taking into account that mobile services can be considered a subgroup of electronic services. The sub dimensions adopted in this study are website design, reliability, responsiveness, trust, personalization, perceived risk, perceived cognitive control, content usefulness, content adequacy, ease of use, accessibility, interactivity, and perceived website innovativeness. The adoption of these dimensions is suitable because they seem to have an influence on the customer's overall perception about m-commerce service quality and customers' satisfaction. This will then affect the formation of his/her behavioral intention. The overall service quality was determined by three dimensions – service quality, information quality, and system quality – which are described next.

**Service quality:** customers' attitude formed by a long-term, overall evaluation of an m-commerce performance. The dimensions of service quality are measured using seven sub-dimensions: website design, reliability, responsiveness, trust, personalization, perceived risk, and perceived cognitive control.  
**Information quality:** customers' perception of the quality of information presented on a mobile commerce application. The dimension of information quality is measured by two sub-dimensions: content usefulness and content adequacy.  
**System quality:** this refers to customers' perception of a mobile commerce application performance in information retrieval and delivery. The dimension of system quality is measured by four sub-dimensions: easy of use, accessibility, interactivity, and perceived website innovativeness.

### 3.1 *Service Quality Dimensions*

The first dimension, website design, refers to the appearance of a mobile portal and is consistent with the tangibility dimension in the SERVQUAL model. While Parasuraman et al. (1988) defined a tangible dimension as the physical appearance, such as facilities, equipment, and personnel, many researchers replaced this definition with that of the website user required for adapting to the e-service context (Aladwani & Palvia, 2002; Lee & Lin, 2005; Loiacono et al., 2002; O' Cass & Carlson, 2012; Riel et al., 2001; Udo, Bagchi & Kirs, 2010; Wolfinbarger & Gilly, 2003). In this context, the literature suggests that there is a potential positive relationship between website design and overall customer perceived service quality.

The reliability dimension in the SERVQUAL model is composed of dependability, consistency, and accuracy of promised service performance (Parasuraman et al., 1988). New service-delivery studies, with options of computer technology, realized that dependability of performance and consistency are important dimensions in measuring SQ, because the user's consideration of performance risks is based on new technology service (Cox & Dale, 2001; Dabholkar, 1996; Davis, Bagozzi, & Warshaw, 1992). This is relevant to m-commerce services as

customers are always on the move and often in time-critical situations. Therefore, it can be seen that there is a potential positive relationship between reliability and overall customer perceived service quality.

The third dimension is responsiveness, which is similar to the responsiveness dimension in the SERVQUAL model. The SERVQUAL model (Parasuraman et al., 1988) defines responsiveness as employees' willingness to provide a prompt service and to deal with consumer complaints. According to Wang (2003), "responsiveness" is a measure of the company's ability to support customers with the appropriate information when a problem occurs. It is also the mechanism that handles returns, and has the capacity to execute arrangement for online guarantees. Responding quickly to customers' request indicates that the company is customer-oriented. Subsequently, this can subdue the issue of uncertainty and thus increase the perceived convenience of customers (Gummerus et al., 2004; Wolfinbarger & Gilly, 2003). Henceforth, it can be concluded that there is a possible positive relationship between responsiveness and overall customer perceived service quality.

Lynch and Lundquist (1996) noted that e-service, with much academic discourse surrounding security, privacy, and confidence, centers on trust. This is similar to the assurance dimension in the SERVQUAL model. Kimery and McCard (2002) argued that "trust is the user's willingness to accept the vulnerability of an online transaction based on their positive expectations regarding future online provider behaviors". Reichheld and Scheffer (2000) pointed out that trust is a significant antecedent of participation in online settings because of the increased ease with which online transaction can behave opportunistically. Therefore, it is proposed that there will be a positive relationship between trust and overall customer perceived service quality.

Personalization in relation to SQ is defined as caring, individualized attention for the consumer and subject knowledge of employees (Parasuraman et al., 1988). Riel et al. (2001) additionally define personalization, in the e-service context, as the degree of customization of communication and service provider awareness of consumer needs in the e-service context. Personalization is a key feature of most e-commerce and m-commerce business models because it offers real values for a customer and creates a perception of high-quality service. At the heart of personalization is satisfying the unique needs of each customer (Huang & Lin, 2005; Riel et al., 2001). Therefore, it is possible that there is a positive relationship between personalization and overall customer perceived service quality.

Risk, from the e-customers' perception, is one of the major hindrances to online shopping. As a result, major m-commerce firms have endeavored to address risk associated with security technologies, awareness campaigns, and assurance policy statements (Chang et al., 2005; Liao & Cheung, 2002; Lopez-Nicolas & Molina-Castillo, 2008; Shih, 2004). System failure is part of perceived risk and is often associated with a loss. Therefore, understanding how perceived risk influences e-SQ and e-customer satisfaction is easy. Lopez-Nicolas and Molina-Castillo (2008) and Gefen et al. (2003) state that perceived risk influences shopping behavior and e-purchasing intentions. The implication is that the higher the perceived risk, the less likely is an e-customer's intention to purchase. Therefore, it can be said

that there is a negative relationship between perceived risk and overall customer perceived service quality.

Perceived cognitive control depicts a cognitive state of flow experience and generally refers to the belief that the person has, at his or her disposal, a response that can influence an event (Ajzen, 1991). Among others subtle dimensions of perceived control (Ajzen, 1991), cognitive control is said to be an essentiality. Cognitive control requires a person to predict probable sequences of an event and also understand the implications of those consequences. Cognitive control reduces uncertainty (Imada and Nageishi, 1982), and increases the service value perceived by the customers (Bateson, 1985). Also, it clarifies a situation, particularly regarding the need for service involvement (Botvinick et al., 2001). In a retail setting, a customer's perceived cognitive control should evoke affect, because perceived control closely associates with the customer's judgment of whether the environment will facilitate or frustrate his or her goal achievement (Ward and Barnes, 2001). Therefore, it is concluded that there is a potential positive relationship between perceived cognitive control and overall customer perceived service quality.

### 3.2 Information Quality Dimensions

Scholars in the area of traditional computing settings have established well-known models to measure information quality. In a study on the determinants of IS success, DeLone and McLean (1992) assumed that IS success is measured by SQ and information quality. DeLone and McLean (1992) highlighted the importance of relevance, timeliness, and accuracy of information. In the same vein, Doll and Torkzadeh (1988) and Doll, Xia, and Torkzadeh (1994) also emphasized three determinants of user satisfaction: content, accuracy, and timeliness. The dimensions suggested in these two studies and others (Aladwania & Palvia, 2002; Belcher et al., 2000; Bitner et al., 2000; Kaisara and Pather, 2011; Koller 2001; Loiacono et al., 2002; Shemwell & Yavas, 1999; Udo, Bagchi & Kirs, 2010) could be classified into content usefulness and content adequacy.

**Content usefulness:** This refers to the reliability, value, currency, and accuracy of information. To be specific, relevancy and clearness are the concern of information value. Information reliability is defined as the accuracy, dependability, and consistency of the information, while Information currency is interested in the information timeliness and continuous update. Information accuracy describes the extent to which the system information is free from error. Henceforth, it can be assumed that there will be a positive relationship between content usefulness and overall customer perceived service quality.

**Content adequacy:** This is the extent of information completeness. Mobile portals should provide information so as to aid the understanding of the customers as regards the materials and services offered. Additionally, the customers are in need of supplementary services like: professional advice from the providers, useful information, hyperlinks to relevant sites, and contact and promotion information. Therefore, it is deduced that there will be a positive relationship between content adequacy and overall customer perceived service quality.

### 3.3 System Quality Dimensions

Davis et al. (1992) defined ease of use as "the degree to which a person believes that using a particular system would be free of effort". Teo (2001) defined it as "the degree to which the

user expects the use of the system to be user friendly". In the m-commerce environment, what can be used to describe adoption and use of a system increases if there is ease when the system is used to find the customers' needs, and support services are available (Costabile et al., 2005; Uther, 2002). In summary, "ease of use" plays a vital role in customers' perceived mobile SQ (Costabile et al., 2005; Lin & Hsieh, 2011; Papanikolaou & Mavromoustakos, 2006; Udo, Bagchi & Kirs, 2010;). Consequently, it is assumed that there will be a positive relationship between ease of use and overall customer perceived service quality.

**Accessibility,** in traditional marketing literature, speed of delivery, is defined as the time it takes to perform the service actively (Dabholkar, 1996). Maister (1985) argued that if consumers perceive that service is delivered quickly, they are likely to evaluate the service more highly. In the e-services environment, speed of access may also be an important factor to lure users to a particular website (Cho & Park, 2001; Sohn, 2000). Therefore, it is proposed that there is a positive relationship between accessibility and overall customer perceived service quality.

The third dimension for measuring system quality is interactivity, which refers to the interactive relationship between the provider, customers, and other customers on the m-commerce portal, through e-mail communication methods and discussion group activities. According to Wang (2003), Papanikolaou and Mavromoustakos (2006), Aldridge and Rowley (1998), Yang et al., (2005), Kaisara and Pather (2011), Ding et al., (2011), and Papadomichelaki and Mentzas (2012), communication methods, like e-mail and discussion groups, are important tools for customers to use in communicating complaints and inquiries to the provider. Therefore, interactivity is one of the substantial dimensions of the mobile SQ, and has significant positive impacts on the customers' perceived SQ and satisfaction (Aldridge & Rowley, 1998; Ding et al., 2011; Kaisara & Pather, 2011; Kim & Ong, 2005; Papanikolaou & Mavromoustakos, 2006; Papadomichelaki & Mentzas, 2012; Santos, 2003; Siau, & Shen, 2003; Wang, 2003; Yang et al. 2004). Consequently, it is deduced that there is a possible positive relationship between interactivity and overall customer perceived service quality.

The last dimension for measuring system quality is perceived website innovativeness. Prior offline branding studies have shown that based upon their perception of brands, consumers respond to the product or service by, for example, finding it useful/useless, identifying they like/dislike it, or they may approach/avoid buying it (Bloch, 1995; Mono, 1997). In the context of this study, the researchers argue that once a customer makes an assessment that the provider's website-service experience is innovative, he or she will then be more likely to evaluate the website as having delivered a quality e-service. Therefore, it is said that there is a possible positive relationship between perceived website innovativeness and overall customer perceived service quality.

### 3.4 The Relationships between Service Quality, Satisfaction, and Behavioral Intention

In the research literature, there are three different relationships between SQ, consumer satisfaction, and behavioral intention. In the first approach, satisfaction is an antecedent of perceived SQ (Satisfaction → SQ) and SQ directly influences

behavioral intentions (SQ → Behavioral Intention) (Bitner, 1990; Bitner & Hubbert, 1994; Bolton & Drew, 1991; Mohr & Bitner, 1995; Oliver, 1981; Zeithaml, Berry, & Parasuraman, 1996). In the second approach, SQ is modeled as an antecedent of satisfaction (SQ → Satisfaction) and satisfaction directly influences behavioral intentions (Satisfaction → Behavioral Intention) (Anderson, et al., 1994; Anderson & Sullivan, 1993; Cronin & Taylor, 1992; Gotlieb, et al., 1994; Taylor & Baker, 1994). In the final approach, the relationship between SQ and satisfaction is not recursive (SQ ↔ Satisfaction); that is, neither SQ nor satisfaction is an antecedent of the other (McAlexander et al., 1994; Taylor & Cronin, 1994). Because of the absence of empirical support for the first and third approaches, and the relatively strong empirical support for the second approach, the second approach (SQ → Satisfaction →

Intention) is applied to the proposed conceptual model for this study. The direct paths from both overall SQ to customer satisfaction, and the direct path from customer satisfaction to behavioral intention on the m-commerce services, are specified in the proposed conceptual model. Therefore, it is deduced that that the customer perception of overall service quality can directly influence the level of customer satisfaction. In addition, it is also deduced that the level of customer satisfaction will directly influence the behavioral intention.

The comprehensive literature review and the in-depth discussions mentioned above provide us with a foundation for developing the theoretical model for customer perceived service quality, customer satisfaction, and their impacts on behavioral intentions of customers as presented in Figure 1:

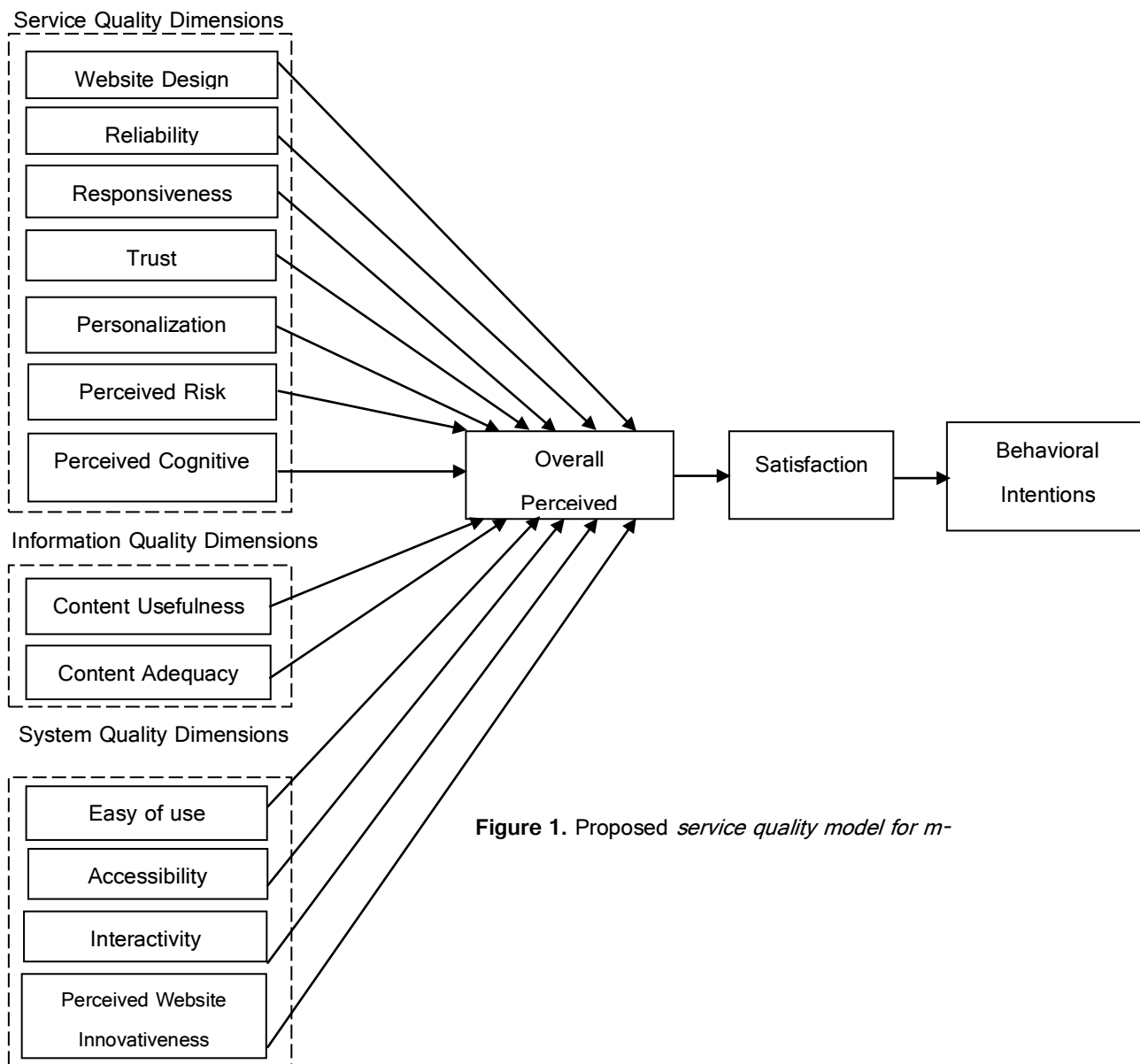


Figure 1. Proposed *service quality model for m-*

#### IV. DISCUSSIONS AND CONCLUSION

Based on a comprehensive review of empirical literatures in the area of marketing, service quality (SQ), and information systems service quality, the present study proposed a multi-dimensional model of service quality for m-commerce. In this model, which also includes the relationships between service quality and other significant constructs, it is proposed that overall perceived service quality is determined by three dimensions, which are Service Quality dimensions (reliability, responsiveness, trust, personalisation, perceived risk, and perceived cognitive control), Information Quality dimensions (content usefulness and content adequacy), and System Quality dimensions (Ease of use, accessibility, Interactivity, and perceived website innovativeness). The overall perceived service quality will then have an impact on satisfaction, and satisfaction will consequently shape the behavior of the customers.

In the process of developing this model, much attention is given to the measurement model of service quality in m-commerce based on the well-known SERVQUAL model. This is in line with the recommendations from many scholars (e.g. Carman, 1990; Cronin & Taylor, 1992; 1994; Finn & Lamb, 1991; Parasuraman & Grewal, 2000), who suggest that the SERVQUAL scale, developed by Parasuraman et al. (1985, 1988), should be modified and revised to suit a particular environment and the nature of the service sector under investigation.

Nonetheless, the proposed model is developed based only on a theoretical perspective. The model will have to be tested empirically in order to measure its practicality and robustness. Henceforth, the model will be more conclusive and the contribution to the research area much more significant.

Despite its limitation, this study provides understanding, specifically to the organizations, companies, and their respective clients, of the strengths and benefits of m-commerce service quality. Thus, it will help to create awareness and new knowledge regarding the importance of using mobile phones for commercial purposes among customers and vendors, hence serving as a long-term benefit to them. A better understanding and practice of m-commerce would increase ability in the purchasing power of customers and the efficiency of businesses. Moreover, this study could increase the understanding of the determinants of m-commerce service quality by customers and vendors, so that users' behavioral intention can benefit the m-commerce vendors. The users could also benefit from the research by knowing how to select the appropriate m-commerce vendors who can provide the m-commerce service quality that they seek. Other than this, the study can assist top management to develop and provide appropriate strategies to support m-commerce.

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