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Customer participation in online co-creation experience: the role of e-service quality

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Abstract

Purpose – This exploratory paper aims to extend the research on customer co-creation behavior into an emerging market. To this end, it empirically examines the influence of e-service quality dimensions on customers' willingness to participate in online co-creation experience, in conjunction with customer attitude and intention.

Design/methodology/approach – Data from a sample of 215 customers from the Egyptian telecommunication sector were collected and analyzed using structural equation modeling technique.

Findings – The findings suggest that, although five e-service quality dimensions (efficiency, system availability, privacy, responsiveness and compensation) affect the attitude toward the Web site, another set of the dimensions (efficiency, fulfillment, compensation and contact) affects customers' willingness to participate in the co-creation experience. The findings also support that customers' attitudes toward the Web site affect the intention to use the Web site, which, in turn, affects customers' willingness to participate in the online co-creation experience.

Practical implications – In their move toward mass customization, companies face the challenge of engaging a huge number of users. Deep and engaging interactions with customers could be one of the differentiators a company might cultivate to serve the market better. Thus, online co-creation activities might broaden the horizon for a cost-effective approach striving for close ties and a high level of customer engagement.

Originality/value – Despite the intensive use of the Internet in distributing e-services, little attention has been paid thus far to extend e-service quality models to incorporate customer participation in the online co-creation experience. In particular, this exploratory study identifies the important dimensions of e-service quality that influences customers' willingness to participate in the online co-creation experience.

Keywords Customer experience, Eservice quality

Paper type Research paper

Introduction

The current wave of technological developments has altered the way in which services are produced and delivered. The multi-feature attributes of Internet service

delivery, including the non-hierarchical, two-way access that is available 24 hours a day, seven days a week (Pinho *et al.*, 2011), presented a paradigm shift in the e-business era. For many organizations with an online presence, the Web site has been a critical tool for facilitating business transactions and boosting customer relationships. Virtual "bricks and clicks" have become a business model for a myriad of companies and service providers worldwide, where online facilities can be incorporated into their offline presence. Other companies, such as Amazon, eBay and 7digital, distribute products and services exclusively through their Web sites. Therefore, "companies must shift the focus of e-business from e-commerce – the transactions – to e-service, all cues and encounters that occur before, during and after the transactions" (Parasuraman *et al.*, 2005, p. 214).

At the same time, customers have adapted to using a combination of remote technological channels (e.g. phone, Internet and mobile) in their interactions with service providers (O'Loughlin and Szmigin, 2005). As a result, companies have not only steadily expanded their range of online and automated services (Herington and Weaven, 2007) but also encouraged customers to co-create these services. Customer collaboration in the service co-creation is essential for value creation. Thus, companies are increasingly building engagement platforms that allow ongoing interactions among firms and their customers (Ramaswamy, 2011) as well as between customers themselves. These engagement platforms take different forms both offline (e.g. call centers, private and public communities) and online (e.g. Web sites, online communities, online stores and applications markets).

However, within this ever-changing context, customer–technology interaction involves a highly complex, meaning-laden, long-term process; this technology can trigger both positive and negative feelings – sometimes simultaneously (Mick and Fournier, 1998). Furthermore, customers might have different expectations and varying levels of willingness to participate in the process of service co-creation (Hankanen and Jaakkola, 2012). Despite the intensive use of the Internet and information technology in distributing electronic services, or e-services as they have become more commonly known, little attention has thus far been focused on the simultaneous examination of e-service quality (e-SQ) attributes and customers' willingness to participate in the online co-creation experience, in conjunction with customer attitude and intention, notably within non-Western markets.

Given this lack of knowledge, the current study extends the rapidly growing research stream on customer participation in online co-creation experience into an emerging market context by contextualizing and testing the impact of:

- e-SQ attributes on customers' attitude toward the Web site, which may, in turn, affect customers' behavioral intentions; and

- e-SQ attributes and customers' behavioral intentions on customers' willingness to participate in the online co-creation experience.

The importance of such an approach stems from the fact that this exploratory study aims to extend e-SQ models to incorporate customers' willingness to participate in the online co-creation experience and, hence, examine the opportunities for enhancing customer participation by improving e-SQ attributes.

Theoretical background

e-SQ: definition and measurement

In an attempt to conceptualize e-service, Rowley (2006, p. 341) suggested that "e-service is deeds, efforts or performances whose delivery is mediated by information technology (including the Web, information kiosks and mobile devices)." Focusing on the Web channel, Boyer *et al.* (2002, p. 175) defined e-service as "[the] delivery of all interactive services on the Internet, using advanced telecommunications, information, and multimedia technologies". Therefore, e-service can be defined as the provision of services through electronic media without a direct intervention of the human element from the service provider side. How customers evaluate the quality of e-services has become the subject of study for many researchers (Jayawardhena, 2004; Ribbink *et al.*, 2004; Parasuraman *et al.*, 2005; Zhu and Lin, 2010). In this context, Parasuraman *et al.* (2005, p. 217) defined e-SQ as "the extent to which a Web site facilitates efficient and effective shopping, purchasing, and delivery". In contrast to the evaluation of sub-processes in traditional services, after visiting a Web site, customers are more likely to evaluate their overall experience. Thus, e-SQ has been constructed as "customers' overall evaluation and judgment regarding the excellence and quality of e-service delivery in the virtual market place" (Santos, 2003, p. 235). Consistent with this definition, e-SQ is conceptualized as "the provision of a superior consumer experience in all aspects of the service delivered via an organization's Web site" (Carlson and O'Cass, 2010, p. 113).

In measuring the e-SQ, researchers have emphasized two groups of attributes: system attributes (Web site quality) and service attributes (the quality of online retailing) (Gera, 2011). Focusing only on the system attributes, Yoo and Donthu (2001) developed SITEQUAL, with four dimensions: ease of use, aesthetic design, processing speed and security. Meanwhile, Loiacono *et al.* (2002) developed WEBQUAL, arguing that three factors – usefulness, entertainment and response time – were primary indicators of Web site quality. Barnes and Vidgen (2002) developed WebQual 4.0 to assess the quality of an organization's e-commerce. It uses five dimensions: usability, design, information, trust and empathy. WebQual 4.0 is largely based on customers' perceptions of quality weighted by importance.

Zeithaml *et al.* (2002) made one of the early attempts to measure e-SQ, incorporating both system and service attributes. They proposed a multidimensional scale for e-SQ by modifying SERVQUAL. The scale dimensions are classified into two categories: system dimensions, such as ease of use, privacy/confidentiality, fulfillment, efficiency and site design, and service recovery dimensions, such as contact and compensation. Wolfinbarger and Gilly (2003) similarly proposed the 14-item eTailQ scale, which embraces four constructs: Web site design, reliability/fulfillment, privacy/security and customer service. After examining online books and CD stores, Ribbink *et al.* (2004) suggested using five dimensions to assess e-SQ: ease of use, Web site design, customization, responsiveness and assurance. Jayawardhena (2004) used customers' evaluations of e-banking service quality to propose a five-dimensional model comprising access, Web interface, trust, attention and credibility. He further found that customers placed greater importance on Web elements (download speed, ease of navigation, visual presentation aids and search-feature efficiency) than the attention dimension (personal touch).

Using the means-end framework, Parasuraman *et al.* (2005) developed the E-S-QUAL scale to assess electronic service. The scale consists of 22 items related to the following four dimensions:

(1) *Efficiency*: The ease and speed of accessing and using the site.
(2) *Fulfillment*: The extent to which the site's promises about order delivery and item availability are fulfilled.
(3) *System availability*: The correct technical functioning of the site.
(4) *Privacy*: The degree to which the site is safe and protects customer information.

They also constructed a scale for measuring the quality of the service recovery provided by Web sites. This e-recovery service quality scale, called E-RecSQUAL, consists of 11 items related to three dimensions:

(1) *Responsiveness*: Effective handling of problems and returns through the site.
(2) *Compensation*: The degree to which the site compensates customers for problems.
(3) *Contact*: The availability of assistance through telephone or online representatives.

The present study adopts Parasuraman *et al.*'s (2005) E-S-QUAL for a number of reasons. First, the E-S-QUAL scale addresses actual encounters between the customer and the service provider rather than the quality of the Web site, which is consistent with the main purpose of the present research, namely, to examine e-SQ's influence on customers' willingness to participate in online co-creation experience. Second, E-S-QUAL covers customers' entire shopping experience (i.e. the interaction experience and the post-interaction experience), thereby offering a broader picture of the customer experience while considering e-SQ as more than merely the way in which a customer interacts with a Web site. Third, this scale adequately addresses the quality of the e-service recovery process through responsiveness, compensation and contact dimensions. This approach is considered to be rather important in Egypt, a risk-averse society where customers tend to distrust the online business environment (Elsharnouby and Parsons, 2010a). Thus, the existence of e-service recovery dimensions represents another motivating factor in choosing E-S-QUAL.

E-SQ and attitude toward the Web site
Ongoing attempts to explore the dynamism of e-service reveal that e-SQ is associated with some important parameters that companies are constantly seeking to observe. Various e-service attributes affect the development of customer attitudes toward a Web site. If the service the company Web site delivers is perceived to be of higher quality, more favorable attitudes result for the company Web site (Carlson and O'Cass, 2010). Attitude refers to a person's internal evaluation of the object in question, which can be favorable or unfavorable (Ajzen and Fishbein, 1977; Mitchell and Olson, 1981). In the context of the Internet, a customer's attitude toward a Web site has been defined as a predisposition to respond favorably or unfavorably to it (Chen and Wells, 1999).

According to the literature, the two sets of the E-S-QUAL scale dimensions (i.e. e-service quality and e-recovery service quality) affect the post-interaction customer experience, particularly the attitude toward the Web site. For example, efficiency,

fulfillment, system availability and privacy significantly influence customer satisfaction (Kim and Kim, 2010), whereas fulfillment and privacy are significant predictors of customer loyalty (Sheng and Liu, 2010). In addition, factors such as order fulfillment, privacy and security (Wolfinbarger and Gilly, 2003), as well as ease of use, entertainment, currency, product information, trust, and customer support, have all been found to predict customers' attitude toward the Web site (Elliott and Speck, 2005). Lin and Wu (2002) observed that e-SQ attributes such as information content, customization, reliability and response significantly influence perceived ease of use and perceived usefulness, which, in turn, influence the attitude toward using the firm's Web site. A positive attitude occurs when the information is relevant and well organized and the Web site presents safety cues (Van Noort *et al.*, 2008). Luo and Lee (2011) used the Taiwanese airline industry to conclude that perceived usefulness plays a main role in enhancing customers' attitudes toward online shopping and their purchasing intention. More recently, Basoglu *et al.* (2014) argued that three online service platform quality dimensions – ease of use, usefulness and personalization – directly influence customers' attitudes toward the platform. In the tourism sector, Loureiro (2014) pointed out that four components of Web site quality (i.e. design and visual appeal, information content, ease of use and interactive features) indirectly lead to a favorable attitude toward the Web site through customers' dominance and arousal.

Although empirical research examining the relationship between e-recovery service quality dimensions and customer attitudes toward a Web site is limited, the existing studies have observed that higher-quality e-recovery service attributes (e.g. responsiveness, compensation and contact) are likely to influence the development of customers' attitudes. When a problem emerges in an online purchase experience, how the e-retailer handles the service recovery has an impact on satisfaction, which, in turn, affects the behavioral intentions (Collier and Bienstock, 2006). Customers who make purchases on the internet still desire interpersonal facets (contact) along with service encounters in the event of a problem (Forbes *et al.*, 2005). Appropriate compensation from the firm (e.g. upgrading the product, providing additional free merchandise, providing a gift certificate and offering a discount on a future purchase) to correct the mistakes that might happen in the online purchase experience can also lead to positive outcomes, such as higher satisfaction and lower propensity to switch (Forbes *et al.*, 2005). Previous studies have demonstrated that the responsiveness dimension affects perceived service quality and customer satisfaction (Kim and Kim, 2010; Lee and Lin, 2005; Lin, 2007). Wu (2005) argued that perceived interactivity (e.g. a psychological state experienced by a site visitor during the interaction process), which includes three dimensions (i.e. perceived control over the site, perceived responsiveness from the site and perceived personalization of the site), plays a direct role in forming customers' attitudes toward the Web site. Accordingly, this study argues that enhancing the e-SQ attributes (efficiency, system availability, fulfillment, privacy, responsiveness, compensation and contact) will create a favorable attitude toward the company's Web site. Thus, this study hypothesizes that:

H1. E-service quality dimensions positively relate to the attitude toward the Web site.

H1a. Web site efficiency positively relates to the attitude toward the Web site.

H1b. System availability positively relates to the attitude toward the Web site.

H1c. Web site fulfillment positively relates to the attitude toward the Web site.

H1d. Privacy on the Web site positively relates to the attitude toward the Web site.

H1e. Web site responsiveness positively relates to the attitude toward the Web site.

H1f. Compensation through the Web site positively relates to the attitude toward the Web site.

H1g. The availability of contact positively relates to the attitude toward the Web site.

Attitude toward the Web site and intention to use the Web site
A considerable body of literature has examined the impact of customers' attitudes on their intentions in both conventional settings (Ajzen and Fishbein, 1977; Bagozzi *et al.*, 1989; MacKenzie and Lutz, 1989) and the online context (Vijayasarathy and Jones, 2000; Carlson and O'Cass, 2010). The key assumption underpinning this relationship is that the development of positive attitudes will produce corresponding behavior related to the object of the attitude (Griffin and O'Cass, 2004). In this regard, behavioral intention can be worked out from "indicators that signal whether customers will remain with or defect from the company" (Zeithaml *et al.*, 1996, p. 33). Studies such as those by Bruner and Kumar (2000) and Stevenson *et al.* (2000) have revealed that a customer's attitude toward the brand positively relates to the intention to purchase. Attitude has been also shown to significantly influence behavioral intentions, customer choice and consumption satisfaction (Nowlis *et al.*, 2002).

A number of studies have examined the online setting, concluding that attitudes are significant predictors of behavioral intention (Chen and Wells, 1999; Wu, 2003). Thus, a positive attitude toward a Web site would result in favorable behavioral intentions, such as revisitation, word-of-mouth recommendation and purchasing (Carlson and O'Cass, 2010), and ultimately lead to customer stickiness (i.e. the duration of a visit to the site) (Santos, 2003). As demonstrated above, it is expected that:

H2. Customers' attitudes toward the Web site positively relate to the intention to use the Web site.

E-S-Qual and customer co-creation experience
The service-dominant logic (S-D Logic) argues that companies do not sell physical products, but rather provide solutions and benefits for their customers (Lusch *et al.*, 2007). These benefits are meaningless to customers unless they are able to extract value from them. Therefore, a customer is viewed as something "endogenous to both its own value creation and that of the firm" (Vargo and Lusch, 2008, p. 35). In shaping the service experience and determining the service outcome, the role of customers has transformed from a passive audience to an active player/participant. Therefore, value to customers will be derived from the co-created experience associated with interactions with the company instead of being embedded in the product/service offering (Ramaswamy, 2006, 2011).

The quality of customer inputs in this interaction is crucial for determining the value extracted from the firm's offerings (Payne *et al.*, 2008). This requires skills and other resources on the part of customers, but it also requires the firm to make the tasks easier for them and support them in performing these co-creation tasks and activities (Moeller,

2008). In fact, the company's inputs into the customer's co-creation experience is of special importance because the activities and resources the company provides to customers through the various interaction points (e.g. Web sites, hotlines and frontline employees) will either encourage or discourage them from getting involved in the process of co-creating value to receive a successful service outcome (Payne *et al.*, 2008). This high interdependence between the two parties in value creation indicates that the customer–firm interaction represents the *locus* of value (Grönroos, 2006, 2011; Lusch and Vargo, 2006). Thus, firms should determine how to support a customer in the two phases of value creation (i.e. production and consumption) by offering opportunities to co-create value at levels consistent with the customer's desire (Moeller, 2008). Prahalad and Ramaswamy (2004) argued that the building blocks of the co-creation experience are dialogue, access, risk management and transparency. Firms should allow customers to access important resources and create a dialogue with customers to aid the integration of resources and inputs from various actors in the co-creation experience. This can be accomplished by developing and enhancing interaction platforms for customers' use to create a favorable service experience (Mahrous and Kotb, 2014; Prahalad and Ramaswamy, 2004). For example, firms can provide customers with an easy-to-navigate Web site, which makes customization easier. They can also provide users with a range of information concerning the company's products and services, lists of local dealers and upcoming special events (Hanson, 2000). Such information can help firms offer customers highly personalized experiences in the consumption phase.

The service quality literature supports the effect of online interaction platforms attributes on customers' participation and value creation. Both overall e-SQ (Carlson and O'Cass, 2010; Gera, 2011) and its dimensions (Kim and Kim, 2010; Sheng and Liu, 2010) influence the post-interaction customer experience (e.g. willingness to participate in the co-creation experience). For example, Santos (2003) argued that e-SQ can involve customers in the product development process through quick feedback and enhanced customer relationships. Parasuraman *et al.* (2005) argued that the seven e-SQ dimensions (i.e. efficiency, system availability, fulfillment, privacy, responsiveness, compensation and contact) have significant impacts on perceived quality of the site and perceived value of the site. Furthermore, based on two examples from the motorbike and pharmaceutical industries, Sawhney *et al.* (2005) concluded that, when firms enhance the quality attributes of their Internet-based mechanisms for customers' interaction (e.g. interactivity, enhanced reach, persistence, speed and flexibility), it encourages customers to engage in collaborative product innovation. According to Herington and Weaven (2007), providing user-friendly (easy for users to navigate) and efficient (reliable when customers interact with and transact on them) Web sites contributes to building e-trust and developing close relationships with bank customers. Designing an effective Web site can also help transform offline processes into online processes, thereby creating a better value by enhancing productivity, reducing costs and saving time (Pinho *et al.*, 2011). Furthermore, e-service recovery quality is believed to play a critical role in the formation of overall e-SQ and, consequently, influences customer behavioral intentions (Collier and Bienstock, 2006). Therefore, enhancing the quality of the e-service encounters between parties is crucial for co-creating value (Fyrberg and Jüriado, 2009; Grönroos and Helle, 2010). Accordingly, this study argues that enhancing the e-SQ dimensions (efficiency, availability, fulfillment, privacy, responsiveness, compensation

and contact) will create favorable circumstances that will increase customers' willingness to participate in the co-creation experience. Hence, this study predicts that:

H3. The e-SQ dimensions positively relate to customers' willingness to participate in the co-creation experience.

H3a. Web site efficiency positively relates to customers' willingness to participate in the co-creation experience.

H3b. System availability positively relates to customers' willingness to participate in the co-creation experience.

H3c. Web site fulfillment positively relates to customers' willingness to participate in the co-creation experience.

H3d. Privacy on the Web site positively relates to customers' willingness to participate in the co-creation experience.

H3e. Web site responsiveness positively relates to customers' willingness to participate in the co-creation experience.

H3f. Compensation through the Web site positively relates to customers' willingness to participate in the co-creation experience.

H3g. The availability of contact positively relates to customers' willingness to participate in the co-creation experience.

Intention to use the Web site and the customer co-creation experience
According to the theory of planned behavior (TPB), "behavioral intentions are assumed to be causal antecedents of corresponding behavior" (Ajzen, 2012, p. 450). The results of meta-analysis syntheses of TPB research (Armitage and Conner, 2001) indicate that, in specific behavior domains like technology adoption, the mean multiple correlations between intention to use a technology and the actual use of this technology are very high. In the networked world, studies have shown that firms use their Web sites as platforms for co-creating value with customers (Sawhney *et al.*, 2005). In the travel and tourism sector, research has shown that users' activities on a Web site (i.e. participation) affect most value dimensions at different magnitudes (Mohd-Any *et al.*, 2015). Therefore, firms are expected to attract customers to use the firm's Web site to engage them in the online co-creation experience required for a successful service outcome (Sawhney *et al.*, 2005).

In light of this understanding, it can be argued that if customers intend to use the Web site, they will eventually use it and, thus, will be more inclined to use the Web site to perform the necessary tasks (e.g. download software, analytical and diagnostic tools and updated promotional information) to extract the value required from consuming a specific service (Russo and Watkins, 2005). Accordingly, this study hypothesizes that:

H4. A positive relationship exists between the intention to use a Web site and customers' willingness to participate in the co-creation experience.

Research context: the Egyptian telecommunication sector
The Egyptian telecommunication sector was chosen as the context for the present study. This sector consists of two types of service operators. The first type involves three

operators, namely, Mobinil, Vodafone and Etisalat. The second type is the state-owned company, Telecom Egypt. For a number of connected reasons, the telecommunications private sector represents a fruitful context in which to explore e-SQ and customers' online co-creation experience. First, the Egyptian private sector, in general, has witnessed rapid changes, particularly in the wake of the reforms and deregulation of the 1990s. These reforms led to noticeable changes, such as rapid technological change, larger institutions and the entry of multinational players. Second, with the entry of the third operator, Etisalat, in 2007, the competition heated up, which seriously affected the type and nature of the interactions between service providers and customers. With a nearly saturated market, coupled with the ongoing political uncertainties and the economic difficulties, the three companies strive to keep or even enhance their market share. Figures from National Telecommunications Regularity Authority (NTRA), the regulatory body in Egypt, show high variability in the number of subscribers to each company in the past three years.

Third, with the huge number of subscribers, as indicated in the methodology section, these companies have adopted a range of tools to enhance service encounters and boost customers' willingness to co-create services, such as interactive Web sites, online shops, companies' online platforms accommodated on their Web sites through which customers can participate in online co-creation activities (e.g. Twitter, Facebook, YouTube, Google Plus) and online self-care where customers can manage their accounts online. With largely impersonal interactions between companies and their millions of customers, premised mainly on transactional efficiency and lowest costs, online co-creation experience may provide a pathway for such companies to create personalized unique customer experiences. Fourth, culturally speaking, Egypt is a risk-averse society (Farid, 2007), which explains the general distrust of the online environment for business transactions (Elsharnouby and Parsons, 2010a). Undoubtedly, this poses a challenge for service providers, who will need to mitigate the perception of risk among customers associated with the online co-creation experience.

Methodology
Measures and survey instrument
This research uses a survey as the main method of data collection. The measurement scales used to represent the constructs in the research hypotheses were derived from previously validated scales. Where necessary, a few previous scales were adjusted slightly to cope with the nature of the research and contextualize the research in the Egyptian telecommunication sector. To reach the target sample, a clear condition was included in the questionnaire introduction to screen participants (i.e. they continued if they had experience with one of the three operators' Web sites). In total, 52 items were used, together with some demographic questions. In the first section, qualified respondents were asked to provide some descriptive data, such as the name of the mobile telecom company with which they dealt, the main contact method they used to interact with the company and how often they visited the company's Web site. Respondents were then asked to answer the remaining questions in relation to the company's online site with which they interacted. In the second section, respondents were asked to evaluate e-service attributes related to the seven dimensions of e-SQ (i.e. efficiency, system availability, fulfillment, privacy, responsiveness, compensation and contact) based on their experiences with the company's Web site. The e-SQ dimensions

were measured using Parasuraman et al.'s (2005) E-S-QUAL; respondents rated the e-SQ dimensions on a five-point scale (1 = strongly disagree, 5 = strongly agree).

In the subsequent sections, respondents were asked to give their opinions about attitude toward the Web site, behavioral intention and willingness to participate in the online co-creation experience. The attitude toward the Web site construct was measured using a five-item scale derived from Bruner and Kumar's (2000) and Carlson and O'Cass's (2010) previous Web-based studies. The measurement of behavioral intentions was adapted from Zeithaml et al.'s (1996) behavioral intention battery, which is a common measure to assess customer behavioral intentions in the traditional services marketing context. Finally, willingness to participate in the online co-creation experience was measured using a reflective context-specific scale. The scale consisted of seven items rated on a scale ranging from 1 to 5 (1 = highly unlikely, 5 = highly likely). The items measured customers' willingness to participate in three kinds of customer–firm interactions: dialogue between the firm and the customer about product/service offering, communications with other customers and use of software and information sources provided by the firm. All of the scales' items are included in the Appendix. In the final section, respondents were asked to provide general information, including demographic variables such as age, gender, education, income level and profession. A pilot test was conducted with 25 respondents from various socio-demographic backgrounds to check the validity of the multiple-item measures developed for this study. A few items were changed slightly because they were either vague or repetitive. The measures' validity and reliability data are presented in the results section.

Sample selection and data collection
As the research context is the Egyptian telecommunication sector, the research population consists entirely of customers of the three Egyptian mobile operators who have Internet access and visit the operators' Web sites. The Egyptian Ministry of Communications and Information Technology (MCIT) statistics show that there are 93.68 million mobile subscriptions and 30.94 million Internet users in Egypt (MCIT, 2012). However, due to the difficulty of determining the exact size of the population and the lack of an accessible sampling frame for these customers, a convenient sample was drawn. The sample size was determined based on the nature of the research, the number of research variables, the statistical analysis used and the resources constrained (Malhotra et al., 2013). The research is exploratory in nature and involves testing ten constructs with no under-identified constructs using structural equation modeling (SEM). Given the factors and the underlying assumptions of the sample size appropriate for SEM, a sample size of 400 customers was deemed appropriate for this study (Hair et al., 2010).

Over a period of five months, two data collection modes were used: an online questionnaire and an offline self-administered questionnaire. Mixed-mode surveys are used for different reasons, such as to reduce non-sampling error (i.e. increase the response rate), reduce coverage bias and compensate for the weaknesses of each individual mode (Leeuw, 2005). After launching the online questionnaire, the link to it was posted to the telecommunication companies' online communities with an invitation to respond to it along with a demonstration of its benefits to the companies' customers. Although an online survey is an appropriate data collection mode for reaching the targeted respondents, an offline self-administered questionnaire was also used to collect

data to reach beyond the circle of heavy Internet users and contact more varied geographical, educational and social segments in Egypt (e.g. those who are not members of the online communities we initially targeted). To enhance the comparability of both modes, all questionnaire design factors were kept constant to the greatest degree possible (Leeuw, 2005). Furthermore, the instructions for answering the questionnaires and the layout of the two questionnaire instruments used were almost identical to eliminate any bias that might arise from using different modes of data collection (Hogg, 2002).

By the end of the data collection period, 250 questionnaires were collected, accounting for 62.5 per cent of the 400 questionnaires required. Of these 250 questionnaires, 35 were invalid because of major incompleteness. Therefore, only 215 questionnaires were ultimately usable. Both women (58.2 per cent) and men (41.8 per cent) were represented in the sample; 56.7 per cent of the respondents were between 18 and 35 years of age. Finally, data matching was performed to check for validity bias that might arise because of using different data collection modes (Leeuw, 2005). Subjects were matched in both modes on important variables to examine whether significant differences emerged between the data collected by the online and offline questionnaires. A comparison was conducted using a chi-square analysis and *t*-test between the online and offline data in terms of socio-demographic characteristics and features of service use. The results did not reveal any significant differences.

Results
This study followed a two-step approach to analyze the conceptual framework by first assessing the measurement model and then examining the structural model (incorporating hypotheses testing).

Measurement model
SEM, via LISREL 8.7, was used to test the relationship between e-SQ dimensions and willingness to participate in online co-creation experience because all variables were continuous latent constructs. The structural equation models were fitted using maximum-likelihood estimation (Jöreskog and Sörbom, 2006). The measurement model was tested using first an exploratory factor analysis (EFA) and then a confirmatory factor analysis (CFA).

The e-SQ dimensions were treated as first-order factors. The CFA results are based on first-order factor models specifying the scale items as reflective indicators of their corresponding latent constructs and allowing the latent constructs to intercorrelate. The decision to model e-SQ scale items as reflective indicators specific to the dimension-level latent constructs was based on various criteria (Baumann *et al.*, 2011; Diamantopoulos, 2008). First, this approach remained consistent with Parasuraman *et al.*'s (2005) e-SQ model adopted in this study and with previous studies using the same e-SQ model (Kim and Kim, 2010; Sheng and Liu, 2010). Second, the criteria for distinguishing between formative and reflective indicator models, developed by Jarvis *et al.* (2003) including the high interchangeability of the indicators/items (e.g. dropping an indicator should not alter the conceptual domain of the construct, indicators should have the same or similar content/share a common theme), the expected high covariation between indicators, and the nomological net for the indicators should not differ (i.e. the dimensions of e-SQ, such as efficiency or system availability, have the same antecedents or consequences).

Finally, we also conducted second-order CFAs in which we modeled the latent first-order dimensions as reflective indicators of a second-order overall e-SQ construct. However, the CFA loadings and model-fit indices ($\chi^2(243) = 928.2$; χ^2/df = 3.82; CFI = 0.92; GFI = 0.88; RMSEA = 0.056) were not better than the first-order factor model shown below.

We conducted an EFA on the measurement items of the constructs (KMO = 0.92, Barlett's test of sphericity; p value = 0.001). A careful inspection of the EFA results revealed that some items did not load on the designated factors (completely standardized loading < 0.60) (Field, 2009). Therefore, two items were dropped from intention and co-creation constructs. For the remaining variables in the model, the EFA showed that they loaded on their predetermined factors, and factor loadings ranged from 0.65 to 0.97. Finally, with respect to the reliability test, all Cronbach's α for the 10 extracted factors met the minimum criterion of 0.70 (Nunnally, 1978), indicating satisfactory inter-item reliability.

The CFA was used to assess dimensionality of the study variables. The measurement model including all first-order reflective constructs was tested and exhibited satisfactory fit (χ^2 = 671, p-value < 0.001, χ^2/df = 2.02, RMSEA = 0.044, CFI = 0.99, GFI = 0.92, CAIC = 1.45). The reliability, convergent validity and discriminant validity of the measurement scales were also tested. Reliability was examined based on composite reliability (CR) and average variance extracted (AVE). A scale is considered reliable if CR > 0.70 and AVE > 0.50 (Hair *et al.*, 2010). As shown in Table I, all CR values were above 0.70, and all AVEs ranged from 0.71 to 0.87. Furthermore, convergent validity is established if all item loadings are equal to or above the recommended cutoff value of 0.60 (Hair *et al.*, 2010). All loadings were equal to or above 0.76, suggesting the convergent validity of the scales. Finally, discriminant validity was achieved as the correlations between constructs did not exceed the square roots of AVE (Hair *et al.*, 2010), as shown in Table I. The AVE and CR of the model variables along with the correlation matrix are summarized in Table I.

Structural model
A structural model was developed to examine the effect of e-SQ dimensions on customers' attitudes and willingness to participate in the online co-creation experience (Figure 1). The model provides insights into the differences in the nature of the quality-attitude and quality-willingness to participate in the co-creation experience links across the different dimensions of e-SQ. The structural model tests the direct relationships between the seven dimensions of e-SQ with attitude towards the Web site and willingness to participate in the co-creation experience. The model-fit statistics are good, especially considering the exploratory nature of this research (χ^2 = 272, p-value < 0.001, χ^2/df = 2.08, RMSEA = 0.045, CFI = 0.96, GFI = 0.91, CAIC = 1.42). Accordingly, we went on to interpret the model.

The results indicated in Table II show that only five of the seven e-SQ dimensions significantly affect attitude toward the Web site. Specifically, efficiency (β = 0.31, t-value = 13.88, p < 0.01), system availability (β = 0.19, t-value = 1.84, p < 0.05), privacy (β = 0.04, t-value = 1.90, p < 0.05), responsiveness (β = 0.30, t-value = 12.36, p < 0.01) and compensation (β = 0.24, t-value = 2.09, p < 0.05) were significantly related to the attitude toward the Web site, thus supporting *H1a*, *H1b*, *H1d*, *H1e* and *H1f*. Therefore, *H1* is partially supported. The seven antecedents explained 44 per cent

Factor	AVE	CR	Efficiency	Availability	Fulfillment	Privacy	Responsiveness	Compensation	Contact	Attitude	Intention	Co-creation
Efficiency	0.71	0.95	0.84									
Availability	0.77	0.89	0.13	0.87								
Fulfillment	0.79	0.88	0.23	0.07	0.89							
Privacy	0.81	0.92	0.23	0.20	0.22	0.96						
Responsiveness	0.87	0.91	0.14	0.20	0.21	0.13	0.93					
Compensation	0.83	0.89	0.12	0.08	0.21	0.21	0.24	0.91				
Contact	0.90	0.89	0.13	0.22	0.31	0.19	0.21	0.20	0.95			
Attitude	0.97	0.97	0.64	0.54	0.06	0.27	0.53	0.50	0.12	0.99		
Intention	0.76	0.96	0.44	0.45	0.32	0.17	0.35	0.40	0.25	0.65	0.87	
Co-creation	0.81	0.89	0.50	0.05	0.48	0.09	0.09	0.49	0.29	0.56	0.47	0.90

Notes: AVE = average variance extracted; the diagonal is the square root of AVEs

Table I.
CR, correlation
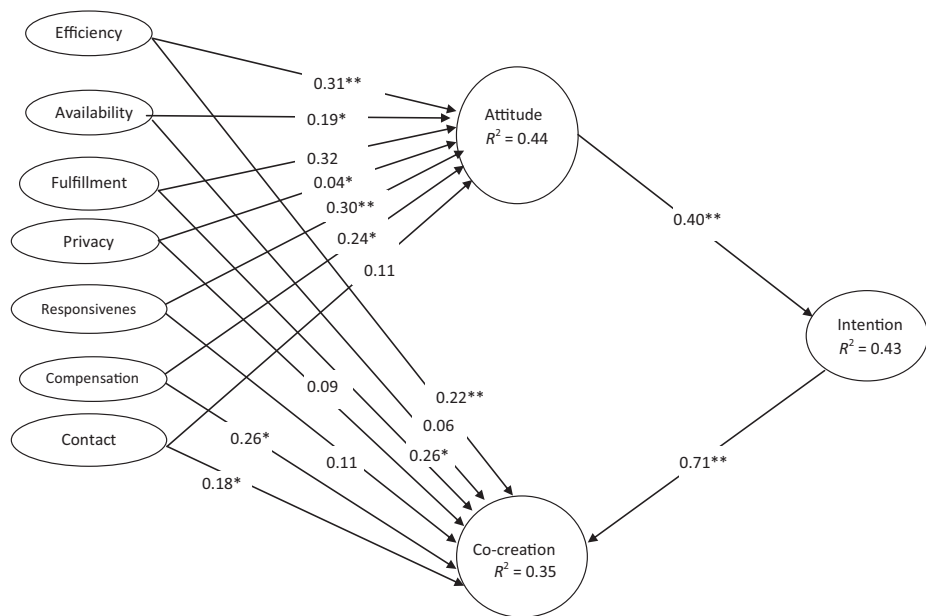matrix and AVE
scores for all the
constructs

Figure 1.
Path diagram

Notes: Based on one-tailed tests, * indicates *t*-values greater than 1.65 (significant at $p < 0.05$);
** indicates *t*-values greater than 2.33 (significant at $p < 0.01$)

of the variation in the attitude toward Web site. The results also show that only four of the seven e-SQ dimensions – efficiency ($\beta = 0.22$, *t*-value = 12.55, $p < 0.01$), fulfillment ($\beta = 0.26$, *t*-value = 1.77, $p < 0.05$), compensation ($\beta = 0.26$, *t*-value = 2.22, $p < 0.05$) and contact ($\beta = 0.18$, *t*-value = 1.66, $p < 0.05$) – significantly affected willingness to participate in the co-creation experience, thereby supporting *H3a*, *H3c*, *H3f* and *H3g*. Thus, *H3* is partially supported. As hypothesized, the results showed that the attitude toward the Web site has a significant positive effect on the intention to use the Web site ($\beta = 0.40$, *t*-value = 10.831, $p < 0.01$), thereby supporting *H2*. In addition, as anticipated, the intention to use the Web site had a significant positive effect on the willingness to participate in the co-creation experience ($\beta = 0.71$, *t*-value = 9.721, $p < 0.01$); hence, *H4* was supported. Finally, only 35 per cent of the variance in the willingness to participate in the co-creation experience could be explained by e-SQ dimensions as well as intention to use the Web site.

Discussion and conclusion

This study examined how e-SQ dimensions influence customers' experiences when encountering a Web site and their subsequent willingness to participate in the online co-creation experience. Considered broadly, the findings provided support for the e-SQ's role in influencing the development of customers' attitudes toward firms' Web sites and enabling the online co-creation experience. Specifically, the quality of five e-service attributes (efficiency, system availability, privacy, responsiveness and compensation) was found to significantly affect the attitude toward the Web site. In other words, the

Relationships	Path coefficient		Hypothesis Testing
	Beta	*t*-value	
H1. e-SQ dimensions and attitude to use the Web site			
Efficiency ⟶ Attitude	0.31	13.88**	Supported
Availability ⟶ Attitude	0.19	1.84*	Supported
Fulfillment ⟶ Attitude	0.32	0.87	Not supported
Privacy ⟶ Attitude	0.04	1.90*	Supported
Responsiveness ⟶ Attitude	0.30	12.36**	Supported
Compensation ⟶ Attitude	0.24	2.09*	Supported
Contact ⟶ Attitude	0.11	0.23	Not supported
H2. Attitude and intention to use the Web site			
Attitude ⟶ Intention	0.40	10.83**	Supported
H3. Intention to use the Web site and willingness to participate in co-creation experience			
Intention ⟶ Willingness to co-create value	0.71	9.72**	Supported
H4. e-SQ dimensions and willingness to participate in co-creation experience			
Efficiency ⟶ Willingness to co-create value	0.22	12.55**	Supported
Availability ⟶ Willingness to co-create value	0.06	0.60	Not supported
Fulfillment ⟶ Willingness to co-create value	0.26	1.77*	Supported
Privacy ⟶ Willingness to co-create value	0.09	1.40	Not supported
Responsiveness ⟶ Willingness to co-create value	0.11	0.60	Not supported
Compensation ⟶ Willingness to co-create value	0.26	2.22*	Supported
Contact ⟶ Willingness to co-create value	0.18	1.66*	Supported

Notes: Based on one-tailed tests, *indicates *t*-values greater than 1.65 (significant at $p < 0.05$); **indicates *t*-values greater than 2.33 (significant at $p < 0.01$)

Table II.
Standardized path coefficients and adjusted *t*-statistics for effects of e-SQ dimensions on attitude and willingness to participate in co-create experience

higher the perceived quality of these e-service attributes offered by the company (including the quality of interaction experience, the post-interaction experience and the quality of the e-service recovery process in case of service failure), the more favorable the attitudes are toward the company's Web site.

Given the lack of literature concerning the link between e-SQ dimensions and customers' attitudes toward the Web site, these findings shed new light on the role of customers' evaluation of e-SQ attributes in formulating a favorable or unfavorable attitude toward telecommunication companies' Web sites. In the sports context, Carlson and O'Cass (2010) found that overall e-SQ acts as an antecedent to customers' attitudes toward Web sites. Using a variety of different settings, previous studies have demonstrated that different e-SQ dimensions affect consumers' attitudes toward Web sites. For example, attitude has been partially influenced by privacy (Wolfinbarger and Gilly, 2003; Van Noort *et al.*, 2008), system availability (Elliott and Speck, 2005), responsiveness (Wu, 2005) and efficiency (Basoglu *et al.*, 2014; Loureiro, 2014; Van Noort *et al.*, 2008). Therefore, this study expands such research to the telecommunication sector in an emerging market, revealing that a specific set of e-SQ dimensions influences customers' attitudes toward the telecommunication companies' Web sites.

The study findings support the contention of earlier traditional consumer behavior studies (Ajzen and Fishbein, 1977; Bagozzi *et al.*, 1989; MacKenzie and Lutz, 1989) that consumers' attitudes influence their intentions. The findings are also consistent with

findings from online consumer behavior studies (Carlson and O'Cass, 2010; Moon and Kim, 2001; Vijayasarathy and Jones, 2000) that proved that the attitude toward the Web site has a significant positive effect on the behavioral intention to use the Web site. Thus, developing positive attitudes toward the Web site will produce corresponding favorable behavioral intentions, such as purchasing and repeat purchasing from the Web site, word of mouth, revisitation and referrals. This finding provides a new perspective on the influence of customer attitudes, which are formed through customers experiences with e-SQ attributes (e.g. efficiency, system availability, privacy, responsiveness and compensation), on customers' intentions to use the telecommunication companies' Web sites.

Four of the seven e-SQ dimensions (efficiency, fulfillment, compensation and contact) significantly affected willingness to participate in the online co-creation experience. These findings show that not all e-SQ attributes are equally important in enhancing customers' engagement in the online co-creation experience. A better quality of efficiency, fulfillment, compensation and contact dimensions would result in better participation from the customer side. This includes customers' active participation in the company's online platforms to communicate problems or express their needs, suggest improvements, use the information shared for better use of the services offered and generate more customer-to-customer interactions. These findings empirically support previous studies' findings concerning the role that customers' evaluation of e-SQ attributes might play in the post-interaction consumer experience. Much of the marketing literature focuses on the influence of e-SQ on different post-purchase consequences, such as perceived quality and value of the company's Web site (Parasuraman *et al.*, 2005), e-trust and close relationships (Herington and Weaven, 2007), e-satisfaction (Kim and Kim, 2010), e-loyalty (Sheng and Liu, 2010) and behavioral intention (Carlson and O'Cass, 2010). However, these findings build upon previous studies (Fyrberg and Jüriado, 2009; Grönroos and Helle, 2010), exploring the influence of e-SQ dimensions on customers' willingness to participate in the online co-creation experience. For example, the findings of this study concur with the findings of a recent study by Gabisch and Milne (2014) that compensation is a key determinant for the level of ownership rights and the privacy control customers are willing to share in online transactions in relation to their private information.

Our findings also confirm that the intention to use the Web site has a significant positive effect on the willingness to participate in the online co-creation experience. The findings here show that intention to use the Web site acts as a key antecedent to customers' willingness to engage in the co-creation behavior. This finding is consistent with existing S-D logic literature, which has shown that customers create experiences when engaging in co-creation activities (Prahalad and Ramaswamy, 2004). The results also reflect the earlier findings of co-creation studies, which – for example – demonstrated that customers' inputs in this interaction is a key determinant for the value extracted from the firm's offerings (Payne *et al.*, 2008) and the success of co-creation experience (Prahalad and Ramaswamy, 2004).

Implications
This research carries a number of implications for academics and practitioners. The empirical findings of this study suggest that e-SQ attributes play a substantive role in shaping customers' online co-creation experience either directly or indirectly by

influencing customers' attitudes toward a company's Web site and their intention to use the Web site. The results related to the dimensions of privacy, responsiveness and system availability as key e-SQ dimensions influencing the attitude toward the Web site and subsequent co-creation behaviors support the results of the stream of online shopping studies in emerging markets such as Egypt. Privacy protection and the existence of a brick-and-mortar store in addition to an online store are crucial factors for alleviating some of customers' concerns during online transactions (Mahrous, 2011). In a risk-averse society, this might explain why trust was found to be highly critical in reducing perceived risk and cementing customer–service provider relationships in the Egyptian online context (Elsharnouby and Parsons, 2010a, 2013). Indeed, Hyder and Fregidou-Malama (2009, p. 266) observes that, "while trust is important in services marketing, trust is a cultural requirement in Egypt, and present in all deals", another interesting finding related to the responsiveness dimension (e.g. effective handling of problems and returns through the site). This dimension is of particular importance in the online setting in Egypt as a means of building trust (Elsharnouby and Parsons, 2010a). Therefore, effective handling of customers' problems and complaints through the company's Web site is deemed crucial in forming a favorable attitude toward the Web site. Apropos system availability, it should be noted that not all customers look for relational interactions in their encounters with service providers (Elsharnouby and Parsons, 2010b). Instead, some are interested in largely utilitarian interactions, where functionality (e.g. the technical functioning of the site) is the decisive factor in forming their attitude toward the Web site and, consequently, their online interaction experience. Not surprisingly, in the online sphere, functionality is considered a key factor for different categories of customers. Thus, service providers should establish and maintain a technically sound error-free Web site as a core feature to be expected by customers.

The service quality literature has argued that the service quality dimensions' relative importance might differ based on the nature of the service (Sachdev and Verma, 2004) and cultures (Guesalaga and Pitta, 2014). In some e-service contexts, such as the telecommunication industry, which has a high degree of technology/customer interaction, the attributes of efficiency, fulfillment, compensation and contact might play a more important role than other attributes in forming customers' online experience. In other words, when the e-service delivery platform is adequately performing, is reliable and offers suitable rewards to customers, as well as provides the possibility of talking to real persons, when necessary, customers will be more likely to subsequently engage with the firm in the online co-creation behaviors required to extract the desired value.

In their move toward mass customization, some companies face the challenge of engaging a huge number of users. With almost the same range of products and services offered by all telecommunications companies, deep and engaging interactions with customers could be one of the differentiators a company might cultivate to serve the market better. Thus, online co-creation activities might broaden the horizon for a cost-effective approach striving for close ties and a high level of customer engagement. This would help the companies get timely customer feedback and deliver the information needed for customers to obtain the right service and appropriate service recovery. One critical avenue that this study proposes for enhancing customers' online co-creation experience is developing e-SQ attributes, particularly the key features related to the efficiency, fulfillment, compensation and contact dimensions. In closing,

this study illuminates a pressing need for a more critical examination of the key predictors of customers' willingness to co-create services within the ongoing depersonalization and automation of service delivery.

Limitations and future research

The findings of this study need to be viewed in light of their limitations. First, this study is explorative in nature; hence, the study should be replicated using a larger sample and perhaps a causal design to provide more robust findings. Second, the interaction between companies and customers takes place through many interaction points, such as Web sites, mobile applications, hotlines and frontline employees. However, this study focused exclusively on the influence of the quality of customer interaction through the Web site in question on customer participation in the co-creation experience. Nevertheless, customer participation might be affected by other interaction platforms between the company and the customer, not merely the quality of the Web site. Thus, further research should examine the effects of other interaction points in customers' participation on the Web site. Third, this study used a non-probability sample. Although non-probability sampling is the norm rather than the exception in the information system literature (Malhotra *et al.*, 2004), caution is advised when attempting to generalize the findings beyond the boundaries of this sample. Fourth, more interpretive consumer research could be integrated into future research to provide a contextualist view, which reflects the dynamics of consumers' experience as a pattern emerging from a context. Fifth, although service-dominant logic emphasizes the primacy of operant resources as the fundamental source of a competitive advantage (Lusch *et al.*, 2007), resources are valuable only within a particular socio-demographic context. Customers differ in many socio-demographic factors, such as educational background, Internet experience or ethnic group, and different customers tend to use and assess resources in different ways (Edvardsson *et al.*, 2011). Therefore, empirical research is needed to examine the moderating role of socio-demographic factors on the relationship between physical resources (e.g. e-SQ dimensions) and value co-creation. In other words, which value is co-created through the use of physical resources in different socio-demographic situations? Finally, it might also be interesting to investigate the relationship across multi-dimensional antecedents (e-SQ dimensions) and a multi-dimensional consequence (co-creation of value behaviors).

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Appendix

Dimension	Item
Efficiency	This site makes it easy to find what I need
	It makes it easy to get anywhere on the site
	It enables me to complete a transaction quickly
	Information at this site is well organized
	It loads its pages fast
	This site is simple to use
	This site design enables me to deal with it quickly
	This site is well organized
System availability	This site is always available for business
	This site launches and runs right away
	This site does not crash
	Pages at this site do not freeze after I enter my order information
Fulfillment	It delivers orders when promised
	This site makes items available for delivery within a suitable time frame
	It quickly delivers what I order
	It has in stock the items the company claims to have
	It is truthful about its offerings
	It makes accurate promises about delivery of products
Privacy	It protects information about my Web-shopping behavior
	It does not share my personal information with other sites
	This site protects information about my credit card
Responsiveness	It provides me with convenient options for returning items
	This site handles product returns well
	This site offers a meaningful guarantee
	It tells me what to do if my transaction is not processed
	It takes care of problems promptly
Compensation	This site compensates me for problems it creates
	It compensates me when what I ordered doesn't arrive on time
	It picks up items I want to return from my home or business
Contact	This site provides a telephone number to reach the company
	This site has customer service representatives/available online
	It offers the ability to speak to a live person if there is a problem
Attitude toward the Web site	This is a good Web site
	I have a favorable view of the Web site
	I like to visit this Web site
Intention to use the Web site	I will purchase products from the Web site in the future
	I will say positive things about this Web site
	I will revisit this Web site in the future
	I will do more business with this Web site in the future
	I will recommend the Web site to others who seek my advice
	I would not consider switching to another related Web site

Table AI.
Scale items

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Dimension	Item
Willingness to participate in the co-creation experience	Give feedback about the company's services/products
	Discuss needs and wants related to the company's services/products
	Engage in communications with other customers about the company's services/products
	Suggest improvements to current products and services
	Suggest new products and services
	Search for information (e.g. new services and offers) on the company's Web site
	Download software (e.g. diagnostic software, drivers) from the company's Web site

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