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## **Evaluating Electronic Service Quality: A Transaction Process Based Evaluation Model**

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**Abstract:** With the rapid growth of the Internet and the globalization of the market, most enterprises are trying to attract and win customers in the highly competitive electronic market. Best practice exemplars suggest that e-service plays a critical role in e-marketing, which wins customers for enterprises through the Internet. This paper addresses the issue how to evaluate web service in the electronic marketplace. We draw on the e-service quality perspective to suggest that enterprises that develop good content service and functional service in the transaction process can win more customers in the electronic market. In this study an e-service quality evaluation model is conceptualized based on the literature review of the dimensions of e-service quality. Our study suggests that the service quality of both content service and functional service in e-service are important for enterprises to attract customers in the electronic market. In this study the evaluation process is based on customers' online purchasing process. It illustrates that different dimensions of e-service quality are of different importance in different purchasing phrases. Furthermore it is implied in this study that good content service quality and function service quality can enable customers to get a good psychological satisfaction, which is vital for customers to make the decision to purchase products or services online, and to establish trust and loyalty to service providers.

**Key words:** Electronic service, Service quality, Evaluation, Transaction process

### **1. Introduction**

With rapid growth of the Internet and the globalization of the market, most enterprises are trying to attract and win customers in the highly competitive electronic market. Electronic service (e-service) is becoming increasingly important not only in determining the success or failure of electronic commerce (e-commerce) application, but also in providing customers with a convenient service booking channel with interactive information flow in the transaction process (Santos, 2003; Yang et al. 2004). Companies providing e-services to customers aim at delivering high value to customer, building customer loyalty, encouraging repeated purchases, and maintaining long-term relationships with customers. Companies shift their focus to e-service in their complete transaction process – pre, in, and post- transaction stages (Cristobal, 2007). Such shift implies that understanding how customers perceive and evaluate e-service quality is of importance for companies.

Online service delivery is very different from traditional service delivery, which is based on interactive information flow between customers and service providers. E-service quality has been regarded as having the potential not only to deliver strategic benefits, but also to enhance operational efficiency and profitability (Cronin, 2003; Zeithaml, 2000). E-service is becoming even more critical for companies to retain and attract customers. What brings online customers back to company's websites is a sense of loyalty that comes from good services offered by companies. Oliveria et al. (2002) suggest that companies can achieve competitive capabilities by offering good e-services to customers (Oliveria et al., 2002). Service quality has strong impacts on customer satisfaction on the performance of companies.

There are a range of studies on the dimensions, measures and attributes of e-service quality. The purpose of this paper is to uncover and interpret the current researches in the dimensions of e-service quality, and to conceptualize an e-service quality model based on transaction process, which provides fresh insight into the dimensions of e-service quality.

## 2. Defining e-service

Recently e-service has become popular in the world with the proliferation of the Internet, but the theory and practice of e-service is still in its infancy (Santos 2003), and there is not an agreement on the definition of e-service.

Ghosh (2004) conceptualizes e-service as interactive information service. On one side, the information on customers collected in e-service process can be gathered and analyzed by e-service providers, and used as the basis for their customized services. On the other side, for customers e-service transaction and e-service delivery can be fulfilled through exchange of information with service providers (Ghosh et al., 2004)

Zeithaml et al. (2000) state that e-service is web services which are delivered through the Internet. In e-service customer's interaction or contacts with service providers is through technology, such as their web sites. Customers have to rely entirely on information technology in an e-service encounter (Zeithaml et al., 2000).

Rust and Lemon (2001) conceptualize e-service as information service or self-service since the primary value exchanged between the two parties (e.g. buyer and seller) is information. Internet is a network which permits the exchange of information. In the Internet environment interactive information service can be realized - consumer's wants and needs going in one direction, and highly customized information going in the other direction (Rust and Lemon, 2001). Internet is used mainly to gratify the needs for information. Information availability is one of the key benefits of online shopping compared with traditional shopping channels (Zeithaml et al., 2002; Kim et al., 2006). E-service is more than order fulfillment, more than responsiveness to inquiries, email, and status requests. E-service provides customers with a different experience with the interactive flow of information. How information is perceived and used, and what information customers need or expect to achieve, plays important role in information quality in e-service process (Salaun and Flores, 2001). E-service process is based on information flow via information technology, and information quality is important in formulations of customer's satisfaction.

Rowley (2006) defines e-service based on the concept of service defined by Hoffman and Bateson and extends it to embrace all Medias, and all kinds of interactions. E-service is deeds, efforts or performances whose delivery is mediated by information technology including the Web, information kiosks and mobile devices. E-tailing, customer support and service, and service delivery are all included in e-service (Rowley, 2006).

In general e-service can be defined as interactive, content-centered, and Internet-based customer service that is driven by the customers and integrated with the support of technologies and systems offered by service providers, which is aiming at strengthening the customer-provider relationship (Ruyter et al., 2001).

## 3. Measurement of e-service quality

With the increasing application of e-commerce in organizations, the importance of measuring and monitoring e-service quality in the virtual world has been recognized. Different studies have been conducted aiming at developing measurement scales adapted to e-service quality field (See Table 1). Table 1 lists the examples of studies on e-service quality, including the context for research and the dimensions of e-service quality. It is evident that most of these studies have been conducted mainly on three different areas: online retailing service quality, web site design quality and online service quality, and there has been limited attention to other service contexts. In fact both web site design quality and online retailing quality are important components of online service quality (Cristobal, 2007).

One of the first definitions of e-service quality is conceptualized by Zeithaml, Parasuraman, and Malhotra (2000). They state that Internet service quality is the extent to which a web site facilitates efficient and effective shopping, purchasing, and delivery of products or services. Zeithaml et al. (2000, 2002) and Parasuraman et al. (2005) carry out a study on Internet service quality based on earlier research on service quality in the traditional distribution channels, and develop an E-S-QUAL scale based on the 7 dimensions proposed by Zeithaml (Zeithaml 2000, 2002; Parasuraman et al., 2005). Zeithaml et al. (2002) conduct the comparison between SERVQUAL and E-S-QUAL dimensions. Zeithaml (2002) state that some dimensions of the SERVQUAL can be applied to e-service quality, but there are additional dimensions in e-service, many of which are specifically related to technology. The E-S-QUAL scale comprises 11 dimensions in e-service quality, and later Parasuraman et al. (2005) developed the E-S-QUAL into to a seven dimensions scale. The seven dimensions are split into two separated scales - the core dimensions and the recovery dimensions. E-S-QUAL is the name of the scale for the core dimensions: efficiency, system availability, fulfillment, and privacy. The second scale is titled E-RecS-QUAL: responsiveness, compensation, and contact (Parasuraman et al., 2005). It offers the surface dimensions of e-service quality based on customers experience and evaluation perspective, which are viewed also as the antecedents to the adoption of e-service (Rowley, 2006).

Much of research work in e-service quality takes a combination of traditional service quality dimensions and web interface quality dimensions as its point of departure. Dabholkar (1996) conducts research work on dimensions of e-service quality focusing on web site design, and 7 dimensions of e-service quality are illustrated as the basic parameters in the judgment of e-service quality (Dabholkar 1996). Yoo and Donthu (2001) develop a scale called SITEQUAL to measure online service quality, which has four dimensions: ease of use, aesthetic design, processing speed, and interactive responsiveness (Yoo and Donthu, 2001). Cox and Dale (2001) set up 6 dimensions of online retailing service quality with the comparison of the traditional dimensions of service quality (Cox and Dale 2001). Wolfinger and

Gilly (2002) develop an e-service quality scale which was initially titled COMQ and later was progressed to eTailQ (Wolfenbarger and Gilly, 2002, 2003). Lociacono et al. (2002) develop an e-service quality scale called WEBQUAL, which is composed of 12 dimensions (Lociacono et al., 2002).

Table 1: Review of the main studies on the dimensions of e-service quality

Author	Dimensions	Context
Dabholkar (1996)	Web site design, reliability, delivery, ease of use, enjoyment and control.	E-service
Zeithaml et al. (2000)	Efficiency, reliability, fulfillment, privacy, responsiveness, compensation, and contact.	Online retailing
Yoo and Douthu (2001)	Ease of use, aesthetic design, processing speed, and security.	Online retailing
Cox and Dale (2001)	Web site appearance, communication, accessibility, credibility, understanding and availability.	Online retailing
Jun and Cai (2001)	Web site design, information, ease of use, access, courtesy, responsiveness, and reliability.	Online banking
Yang (2001)	Web site design, security and information.	Online retailing
Wolfenbarger and Gilly (2002, 2003)	Web site design, reliability, security, and customer service.	Online shopping sites
Zeithaml et al. (2002)	Security, communication, reliability, responsiveness and delivery.	E-service
Madu and Madu (2002)	Performance, features, structure, aesthetics, reliability, serviceability, security and system integrity, trust, responsiveness, service differentiation and customization, Web store police, reputation, assurance and empathy.	E-quality
Loiacono et al. (2002)	Information, interactivity, trust, response time, web site design, intuitiveness, flow, innovativeness, integrated communication, business process and substitutability.	Online retailing
Yang and Jun (2002)	Web site design, security, reliability, responsiveness, accessibility and customization.	Online retailing
Surjadaja et al. (2003)	Security, interaction, responsiveness, information, reliability, delivery, and customization.	E-service
Santos (2003)	Ease of use, appearance, linkage, structure, content, efficiency, reliability, communication, security, incentive and customer support.	E-service
Yang et al. (2003)	Responsiveness, credibility, ease of use, reliability, convenience, communication, access, competence, courtesy, personalization, collaboration, security and aesthetics.	Online retailing
Yang et al. (2004)	Reliability, responsiveness, competence, ease of use, security and product portfolio.	Online shopping sites
Field et al. (2004)	Web site design, reliability, security, and customer service.	E-service
Kim and Stoel (2004)	Web appearance, entertainment, information, transaction capability, responsiveness and trust.	Online retailing
Yang and Fang (2004)	Responsiveness, reliability, credibility, competence, access, courtesy, communication, information, responsiveness and web site design.	E-service
Long and McMellon (2004)	Tangibility, reliability, responsiveness, assurance, empathy, communication and delivery.	Online retailing
Gounaris et al. (2005)	Web site design, information, trust, responsiveness and reputation.	Online retailing
Parasuraman et al. (2005)	Efficiency, availability, fulfillment, privacy, responsiveness, compensation and contact.	E-service
Lee and Lin (2005)	Web site design, reliability, responsiveness, trust and personalization.	Online retailing
Kim et al. (2006)	Efficiency, fulfillment, system availability, privacy, responsiveness, compensation, contact, information and graphic style.	Online retailing
Fassnacht and Koese (2006)	Graphic quality, layout, attractiveness of selection, information, ease of use, technical quality, reliability, functional benefit and emotional benefit.	E-service

There is growing recognition of different variability in the outcome of e-service quality studies in terms of the dimensions of e-service quality (Waite, 2006; Kim et al., 2006). Recently research on e-service quality shows more different dimensions in e-service quality (Surjadaja et al., 2003; Santos 2003; Yang et al., 2003, 2004; Field et al., 2004; Kim and Stoel, 2004; Yang and Fang, 2004; Long and McMellon, 2004; Gounaris et al., 2005; Lee and Lin, 2005; Kim et al., 2006; Fassnacht and Koese, 2006; Cristobal et al., 2007). Madu and Madu (2002) develop a 15 dimensions scale of e-service quality based on better understanding of customer perspective and providing services to meet the needs and expectations of customers (Madu and Madu, 2002). Santos (2003) suggests that both active dimensions and incubative dimensions are important in e-service quality and need to be taken into account. An 11 sub-dimensions scale is developed based on the two dimensions of e-service quality (Santos 2003). Field et al. (2004) develop a process model for assessing and improving service quality by identifying e-service system entities and transactions between those entities and mapping key quality dimensions onto them (Field et al., 2004). Gounaris et al. (2005) suggest that the different dimensions of perceived service quality are influenced by different antecedents (Gounaris et al., 2005). Yang (2002) identifies the differentiation among dimensions between online-purchaser and non-purchaser. Yang and Fang (2004) further examine the differentiation of dimensions to online service satisfaction and dissatisfaction. They suggest that there are four salient quality dimensions leading to both satisfaction and dissatisfaction: responsiveness, reliability, ease of use and competence. As mentioned earlier, Parasuraman et al. (2005) develop the dimensions for core service delivery and recovery services delivery in e-service quality (Parasuraman et al., 2005). Kim et al. (2006) extend the dimensions developed by Parasuraman et al. into a 9 dimensions scale in e-service quality in order to use them for content analysis and evaluation of web sites in the apparel retailing sector.

There are some other significant discussions related to e-service quality as well, for example, in the contexts of technology readiness, service experience, customer satisfaction and web site loyalty. Yen (2005) articulates that the importance of attributes of online customer's satisfaction is dependent on technology readiness. Research on the antecedents to e-service adoption also suggests that e-service experience has impact on customers' perception and evaluation of e-service quality (Yang and Jun, 2002; Rowley, 2006). Cristbal et al. (2007) suggest that the perceived quality of a web site or the degree of customer's satisfaction to a web site is especially relevant to customer's loyalty to a web site, and propose a four dimensions scale of e-service quality based on customer's satisfaction and web site loyalty.

#### **4. Methodology**

This paper aims to identify major works on e-service quality research integrating customers' satisfaction, and establish an e-service quality model based on transaction process. In this study, we adopt a literature review approach. As Easterbt-Smith (2002) states that literature review is a necessary step in structuring a research field and forming an integral part of any research conducted (Easterby-Smith et al. 2002). Literature review is a valid approach, which helps us identify the conceptual content in e-service quality and guides us towards the theoretical development in e-service quality field.

Our study is driven by a theoretical consideration in electronic service quality field. This paper follows a clear process. Firstly, we define research papers in journals in e-service quality as our analysis unit. Secondly, we collect state-of-art publications in journals with a starting point at 1990. Researches on e-services only began with the appearance of electronic commerce and Internet application in business in 1990s.. Thirdly, we analysis the material collected and propose an e-service quality model based on transaction process. Lastly, some issues for further study and research in electronic service filed are put forward.

#### **5. E-service quality model based on transaction process**

Taking into account the limitations on e-service quality models in previous study, this study develops an e-service quality model based on transaction process, since not all service quality dimensions have the same effect on customer's perception of service quality in different stages of transaction process.

##### **5.1 E-service quality dimensions**

In this study we adopt the E-S-QUAL dimensions scale developed by Parasuraman et al. (2005) as the measurement of customers' satisfaction on e-service quality in their online purchasing process. In the context of Parasuraman et al. (2005), the meaning of service is broadened to both pre- and post- transaction stages and the dimensions of E-S-QUAL contains all phrases of a customer's interactive purchasing process on a web site.

As discussed earlier, Parasuraman et al. (2005) develop the E-S-QUAL into a seven dimensions scale. Four of them are the core dimensions, and three of them are the recovery part of e-service quality (Parasuraman et al., 2005). The four core dimensions of E-S-QUAL are:

- (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.

The E-S-QUAL has an e-recovery service quality scale (E-RecS-Qual) for problem solution. It is only applied when customers have questions or run into problems in e-service process. The three dimensions of E-RecS-Qual are:

- (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.

In our model information is also regarded as an important dimension in e-service quality.

## 5.2 Customer's perception of e-service quality in transaction process

According to our transaction process based e-service quality model, online transaction is subdivided into three transaction stages – pre-transaction stage, transaction stage and post-transaction stage (See Figure 1 ).

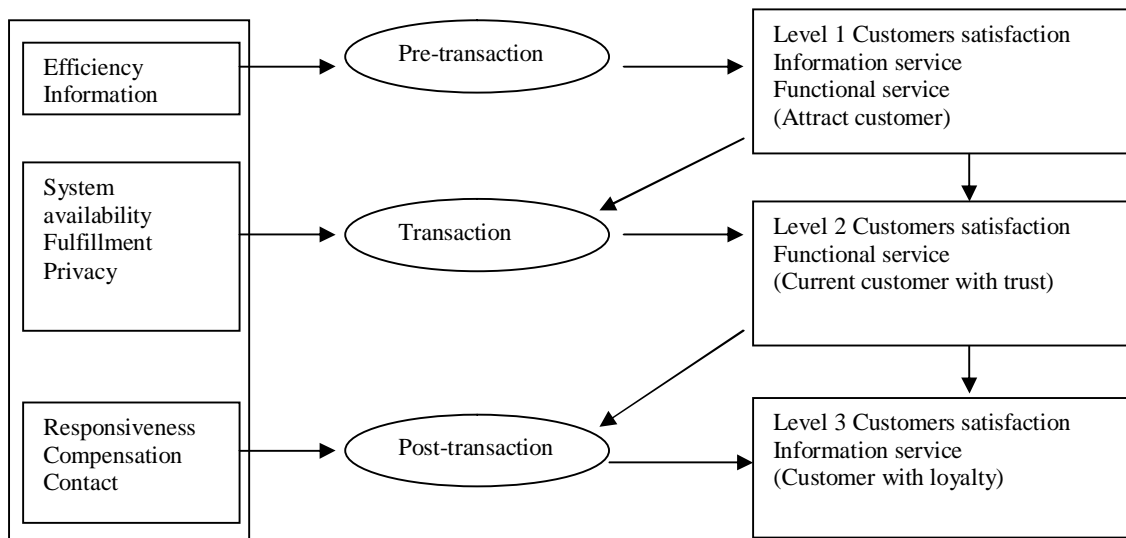


Figure 1: E-service quality model based on transaction process

In the pre-transaction stage, customers search for information about e-service offerings on the Internet. The information about prices, reputation of service providers, payment, delivery time and so on can all be achieved on web sites and assessed by customers, which support customer's final purchase decision with efficient comparison on the online information provided by different service providers (Bauer et al, 2005). At this stage, the evaluation of e-service quality refers mainly to the extent to which the customers are satisfied with information service and efficiency (Zeithaml et al, 2002). Customers can achieve the basic service satisfaction on information and efficiency - customer satisfaction level I. If customers are satisfied with the e-service provided by a web site, they might decide to purchase the service or product online and become a customer of the service provider. Otherwise customers will not purchase, and service providers will lose the opportunities to attract and win customers through the Internet.

At the transaction stage, service suppliers and customers agree on the conditions of their transaction based on their negotiation, and then the transaction is fulfilled. At this stage, the perception of superior quality is determined by the tools or systems the service provider offers to the customers – functional service, for example access to the systems, the efficiency of the systems, delivery time and so on. At this stage different communication channels are available as well, for example e-mails, online chats, discussion forums, online community, voice over IP and so on (Jayawardhena, 2004), which can also help to improve e-service quality in the transaction process. After the online transaction has been completed, the booked goods or services are going to be delivered to the customers. At this stage some important personnel information on the customers will be released to the service provider. Thus, privacy is also an important dimension of e-service quality from the customer perspective. At this stage customers can achieve a much higher satisfaction based on their online transaction experience – customer satisfaction level II. If customers are satisfied with the online transaction service provided by service provider, a real deal will be arrived at, which means customers have been won through the Internet for the service provider. Trust can be achieved among customers based on good e-satisfaction and e-quality in this stage (Ribbink et al. 2004).

At the post-transaction stage, the three dimensions of E-RecS-QUAL are critical in evaluation of e-service quality. In the last phrase e-service quality evaluation refers to the capability for service providers to care for the customers and

to build long-term relationship with customers. The e-service quality at the post-transaction stage relies on the capability and willingness of service providers to respond to customer's problems occurring after the purchase (Parasuraman et al., 2005) and their willingness to inform customers about their special offers and complementary services or products (Bauer, et al 2006). E-service quality can be improved with contacts to customers by the service providers and the improved service based on the customers' needs. As Ribbink et al. (2004) state that the higher the e-quality and e-satisfaction are, the higher the e-loyalty the customers are with. Good service quality at the post-transaction stage is believed to increase online customer's loyalty, which is the main objective of online service providers (Ribbink et al. 2004). Customers with loyalty to an online service provider means that customers have arrived at high psychological satisfaction on the total e-service quality provided by service provider – customer satisfaction level III, which is also based on the information service and functional service experienced by customers in the pre-transaction and transaction stages.

## 6. Discussion and conclusion

An attempt is made in this paper to review various dimensions or measurements of e-service quality. These different dimensions scales are summarized in Table 1. These dimensions cover the domain from online retailing service quality to web site design quality and online service quality including the content service and functional service aspects. These dimensions scales provide a useful framework for e-service quality evaluation.

Based on the literature review of various dimensions of e-service quality, an e-service quality model based on transaction process has been proposed in this study. This e-service quality model illustrates that different dimensions of e-service quality is of different importance in the three stages of transaction process. In the pre-transaction stage customers can get basic satisfaction on e-service quality, which will be further developed with good functional service provided by service providers in the transaction fulfillment stage, and the psychological satisfaction on e-service quality can arrive at a high level in the post-transaction stage with good after sales services offered by the service providers. Customers, thus, can become the users with high trust and loyalty to the service providers. Our study suggests that the service quality of both content service and functional service are important for service providers to attract more customers in the electronic market.

Researchers and practitioners remain considering further work on the context of e-service quality. There is scope for further work on the measurement of e-service quality in the context of pure service sectors and the relationship between e-service quality, customer satisfaction and loyalty.

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