

# Investigation and Identification of Quality Dimensions in e-Business

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**Abstract:** This paper attempts to develop and empirically test a research model that examines the relationship between various e-service quality dimensions and overall service quality, customer satisfaction and purchase intention. The adopted quality dimensions are based on SERVQUAL and its extensions proposed by various researchers which refer specifically to some of the critical factors of electronic services provided by e-shops. A structured questionnaire has been constructed and electronically distributed. Three hundred and sixty usable questionnaires were received. SEM (structural equation modeling) was mainly used to analyse the gathered data and test the validity of the proposed research model. The results showed that the dimensions of web site design, web site usability, information quality, service reliability, responsiveness, trust, and personalization are some of the most important dimensions of quality. Almost all of them have direct or indirect relationship with overall service quality and customer satisfaction which, in turn, have a strong relationship with purchase intentions. Overall, the results suggest that e-shops should develop specific marketing strategies to better address the proposed dimensions of e-services.

## 1 INTRODUCTION

The last few years, companies are experiencing a huge increment of their electronic transactions through PCs, tablets, mobile phones. Companies with experience in e-commerce are starting to realize that their business success is not depending only on the prices of their products or the design of their web site but, also, on the quality of their e-services.

The Greek economy and Greek market are operating in the maelstrom of an economic crisis which can be considered worse than the Great depression at US (Liz Alderman, 2015). On the other hand, the unlucky decision for capital controls in July of 2015 (Maliara, 2015) have made the operation of e-business and especially e-shops one-way road and a necessity for many Greek companies in order to find a way out of the limited, because of austerity measures, market and to show the Greek products and innovating ideas to the rest of the world. As a result, online shopping of Greek consumers is growing (5% in 2015 according to Kassimi, 2016), despite the fact that they are not allowed to purchase from foreign firms operating outside Greece.

In order for e-shops to be competitive in such local environment and, also, to be competitive with e-shops from all over the world, they must adopt an e-business profile that enhance the quality of the e-services provided to customers. Due to the fact that quality is an abstract idea which is difficult to be measured, this research attempted to investigate the quality dimensions of e-business and especially of e-shops.

Thus, one of the most important requirements for the even broader spread of e-business is to ensure a high level of quality in electronic transactions, something that will allow companies and users-consumers realize the advantages of e-business. Needless to say, there are several questions regarding the meaning of e-business quality, with the most important one probably being. "What are the main criteria that should be used to evaluate the quality of e-business transactions?"

This paper will attempt to give an answer to each one of these questions. More specifically, its main target is to evaluate the quality dimensions of e-business (especially for e-shops) and to explore ways to improve them.

## 2 LITERATURE REVIEW

Service quality is an elusive and abstract construct and it is difficult to be measured. The SERVQUAL model, which was proposed in 1988 by Parasuraman et al., (2005) is the most used model for measuring service quality, but it is not the only one. Nevertheless, most of them tried to measure quality based on the traditional idea of service without taking into consideration the realities of e-services. This also applies to SERVQUAL, but it should be stressed that, relatively recently, some researchers extended the dimensions of SERVQUAL in order to more accurately measure service quality in e-business as well).

The procedures for providing e-services (e-business is consisted from a set of e-services) are considered as quality ones when customers' total experience (as perceived by each one of them) is close to their initial expectations. With the explosion of internet and the number of electronic devices connected to it, many researchers have tried to give a clear definition and to propose a valid and reliable scale for measuring e-service quality. According to Parasuraman (2005), the definition of e-service quality (e-SQ) is described as “*extend to which a website facilitates efficient and effective shopping, purchasing and delivery*”.

According to Zeithaml, Parasuraman and Malhotra (2000), a customer's opinion regarding an electronic transaction includes not only the transaction but, also, post interaction services. For these reasons, the e-SQ definition includes all phases of a transaction. The three researchers proposed many different features, from specific cues to more general perpetual attributes, to broad dimensions and, finally, to higher abstractions. Having in mind mostly web sites, they identified many features and categorized them into 11 e-SQ dimensions: (Reliability, Responsiveness, Access, Flexibility, Easy of navigation, Efficiency, Assurance, Security, Price knowledge, Site aesthetics, Customization / personalization).

Parasuraman et al (2005) claims that Zeithaml, Parasuraman and Malhotra (2000) evaluated service quality using the 11 dimensions of e-SQ and they noticed that many customers didn't answered questions regarding service recovery (product returns, problems and how to deal with them and ways to reach company), mainly because many of them had never faced any problems and, thus, they had no experience in service recovery. For these reasons, they set aside the service recover dimensions and defined and e-core service quality

scale (E-S-QUAL), which has 4 dimensions (Efficiency, Fulfillment, System availability, Privacy). The other three dimensions (Responsiveness, Compensation, Contact), concern service recovery, were used for the creation of a e-recovery service quality scale (E-RecS-QUAL).

The Chaffey and Edgar (2000) redesigned the 22 quality characteristics of SERVQUAL model to match the case of e-services (Stiakakis and Georgiadis,2009). According to Blut et al., (2015), there are four dimensions in e-service quality (with different weights): website design, security, customer service, and fulfillment. These dimensions can be used to identify service quality, customer satisfaction and also to predict whether customers will return back for their future shopping.

Latest surveys (Russotti,2015) shows that 81% of shoppers do online research, while 60% of them read product reviews, before they buy a product. The above numbers provide an example of why quality is so important for electronic transactions.

## 3 RESEARCH HYPOTHESES

Since SERVQUAL is not a model that was created for e-services, so remains insufficient to provide a conceptual model of e-service quality. The 11 dimensions of e-service quality, proposed by Zeithaml, Parasuraman and Malhotra (2000), and the e-SQ model, provide an explanation to why most companies that provide e-services usually cannot satisfy their customers' demands. This method can help e-services companies to identify problems and gaps that can be created in the procedures of an electronic transaction and propose ways to eliminate them. The E-S-QUAL and E-RecS-QUAL models can be considered as more specific, to services and service recovery, e-SQ methods, and it is a separation of e-SQ dimensions in two different sections of e-services: the core e-services and service recovery.

Thus, empirical research improvements, proposed by other researchers have been considered in order to propose a new and improved research model. Following the guidelines of Voss (2003), the proposed e-service quality dimensions used by this research are web design, website usability, information quality, reliability, responsiveness, trust, and personalization (it is not claimed that these dimensions are the only important ones). The relationship between the proposed e-service quality dimensions, overall service quality and customer

satisfaction and, in turn, their influence on customers; purchase intentions is discussed below.

### 3.1 Website Design

Web site design is very important (Than and Grandon, 2002) for online stores. It is the first picture that a customer has and, many times, the quality of the web site helps in the creation of a better e-shop image. Web site design is a description of the appeal that user interface design presents to customers (Kim and Lee, 2002). A study that was performed by Wolfinbarger and Gilly (2003) has shown that web design related factors are strong predictors of customer judgment regarding quality, overall satisfaction and loyalty. The following hypotheses are then proposed:

*H1a. Web site design in an e-shop positively influences its overall service quality*

*H1b. Web site design in an e-shop positively influences customer satisfaction*

### 3.2 Website Usability

The usability of a web site (user friendliness) is also a very important factor for determining customers' opinion regarding service quality of an e-shop. The site must be easy to navigate with the minimum of scrolling and availability of instructions of navigation. Parasuraman et al (2005) included website usability as one of the four dimensions of his proposed E-S-QUAL model. The following hypotheses are then proposed:

*H2a. Web site usability in an e-shop positively influences its overall service quality*

*H2b. Web site usability in an e-shop positively influences customer satisfaction*

### 3.3 Information Quality

Another very important factor that influences customer opinion regarding an e-shop has to do with the information presented in the site (how useful, accurate and up dated is that information). Li et al (2002) consider that information quality is very important as far as the quality that customers receive from a web site is concerned. The following hypotheses are then proposed:

*H3a. Web site information quality in an e-shop positively influences its overall service quality*

*H3b. Web site information quality in an e-shop positively influences customer satisfaction*

### 3.4 Reliability

It represents the ability of the web site to fulfill orders correctly, to deliver them promptly and, probably the most important nowadays, to keep customers' personal information secure (Kim and Lee, 2002). For Zhu et al (2002), online stores must provide error free services and secure financial transactions in order customers to feel secure and comfortable when using the e-shop site for shopping. The following hypotheses are then proposed:

*H4a. Reliability in an e-shop positively influences its overall service quality*

*H4b. Reliability in an e-shop positively influences customer satisfaction*

### 3.5 Responsiveness

Customers expect that e-shops will respond to their inquiries as soon as possible. Automated or human initiated emails answering customers' specific questions, and showing an interest from e-shop to solve customer problems, are part of this. It describes how often e-shop provides services, like customer inquiries and information retrieval, that are important for its customers (Parasuraman et al., 1988, Kim and Lee, 2002). The following hypotheses are then proposed:

*H5a. Responsiveness in an e-shop positively influences its overall service quality*

*H5b. Responsiveness in an e-shop positively influences customer satisfaction*

### 3.6 Trust

Many studies have emphasized the importance of trust between customers and e-shops (McKnight et al., 2002). According to Kimery and McCard (2002), trust is defined as customers' willingness to accept vulnerability in a transaction, between him and the e-shop, based on their positive expectations regarding future e-shop behaviors. The following hypotheses are then proposed:

*H6a. Trust in an e-shop positively influences its overall service quality*

*H6b. Trust in an e-shop positively influences customer satisfaction*

### 3.7 Personalization

This is customers' perception of the individual attention and differentiated service that are created to meet customers' individual needs and preferences.

An example of this is the personalized website pages, the personalized contents and the customized products. Also, the lack of real time interactions can be a reason which will prevent potential customers from buying from an e-shop (Yang and Jun, 2002). Wolfenbarger and Gilly (2003) have also studied this issue and showed that customer service influences customer satisfaction. The following hypotheses are then proposed:

*H7a. Personalization in an e-shop positively influences its overall service quality*

*H7b. Personalization in an e-shop positively influences customer satisfaction*

### 3.8 Purchase Intention

Various studies have suggested that customers' perception of service quality and satisfaction have strong influence on positive purchasing intention. For Rust and Zahorik (1993), overall service quality and customer satisfaction positively affect profitability and market share. Llusar et al. (2001) suggest that customer satisfaction is the mediator between perceived quality and purchase intentions. The following hypotheses are then proposed:

*H8. Overall service quality in an online store positively influences customer satisfaction.*

*H9. Overall service quality in an online store positively influences customer purchase intention.*

*H10. Customer satisfaction with an online store positively influences purchase intention.*

## 4 RESEARCH METHODOLOGY

A structured questionnaire was constructed in order to collect the necessary primary data which will allow researchers to empirically test the validity of the proposed research model. The scales used to measure the incorporated factors are adopted from relevant previous studies with minor changes in order to comply with the specific research conditions. Some of the factors (web site design, reliability, responsiveness) are based on the SERVQUAL model, taking into consideration the improvements proposed by other researchers for the case of e-services (Parasuraman et al, 1998; Kim and Lee, 2002). All items were measured with a five-point Likert scale (ranging from 1= strongly disagree to 5=strongly agree).

The questionnaire was constructed and uploaded in Google Forms. This method was selected because it is easy to construct the survey instrument, while it

can be addressed to multiple recipients in many different ways at the same time (web link, email, social media).

Three hundred and sixty valid questionnaires were collected, number that can be considered sufficient in order to be used as input for the statistical analysis. Most of the participants were men (61%), between 30 and 60 years old, highly educated and with good to very good electronic device experience. Most of them (61%) changed their e-shopping behavior after the enforcement of capital controls (July 2015).

## 5 RESULTS

The results (Table 1) show that website design, information quality, service reliability, responsiveness, and trust, are recognized by most of the participants as very important quality factors-dimensions (mean scores between 4,41 - 4,81). Especially for trust, the mean is 4,81, very close to 5, which reflects the importance of security and privacy in electronic transactions. Although personalization mean score is lower (3,72), it is still considered as an important quality dimension. It is important to highlight that the selected quality dimensions play an important role as far as the overall perceived, by the customer, service quality (mean=4,37) and customer satisfaction by an e-shop (mean=4,36). Finally, the perception of quality offered by an e-shop influence customers' purchase intention (mean=4,41).

### 5.1 Factor Analysis

The measures used to test the validity and reliability of the scales used are Factor Loading (Son,2011), Kaiser-Meyer-Olkin (K.M.O) test of adequacy (Hinton et al ,2004), Total Variance Explained (TVE) (Nandagopal et al, 2007), Cronbach  $\alpha$ -value (De Vellis, 2003), (Nunnally, 1978). The results of this analysis (Table 1) support the claim that all factors are both valid and reliable.

### 5.2 Correlation Analysis

The results of the correlation analysis (Spearman's  $r$ ) suggest that most of the demographic characteristics of the participants (gender, age, familiarity with e-transactions, number of e-transactions after the capital controls) are not correlated with the factors incorporated in the proposed model. Only education



Table 1: Factor Analysis.

	Factor Loadings (min, max)	K.M.O	T.V.E	Cronbach $\alpha$ -value	Mean	St. Dev
Website Design (WD)	.681 - .882	.628	63.029	.699	4,49	.461
Information Quality (IQ)	.675 - .840	.738	55.033	.789	4,57	.377
Website Usability (WU)	.748 - .856	.760	65.121	.807	4,07	.608
Service Reliability (SR)	.656 - .720	.795	55.916	.700	4,61	.321
Responsiveness (R)	.740 - .852	.659	65.908	.707	4,41	.472
Trust (T)	.738 - .873	.630	65.029	.722	4,81	.312
Personalization (P)	.806 - .902	.689	74.595	.824	3,72	.802
Overall Service Quality (SQ)	.714 - .765	.629	54.443	.681	4,37	.406
Customer Satisfaction (CS)	.836 - .919	.753	85.222	.913	4,36	.647
Purchase Intention (PI)	.804 - .907	.676	73.784	.815	4,41	.575

seems to have a weak relationship with trust and service reliability.

As far as the correlations between the factors of the model are concerned, it is very important that only information quality and trust seems not to be related with overall service quality, customer satisfaction and purchase intention. This results is not necessarily negative. It probably indicates that since trust level is very high (4,81), it is not play any role. It is the lack of trust what usually negatively affects customer satisfaction and their purchase intention. The same applies for information quality. Once again, it is found that overall service quality and especially customer satisfaction are the two factors that are mainly correlated with purchase intention ( $r=.470$  and  $.626$  respectively).

### 5.3 Structural Equation Modelling

The proposed model was tested using the Structural Equation Modeling (SEM). The relations of the research model are presented in Figure 1, where path coefficients and the relationships between the factors of the proposed model are included.

The Structural Equation modeling (SEM) examines the relationships between one or more independent or dependent variables, continue or discrete (Ullman & Bentler, 2012). There are a wide range of indices in order to have an indication of goodness of fit. These indices are (Svensson, 2004; Byrne, 2001): Minimum Sample Discrepancy / Degrees of Freedom (CMIN/DF), Relative Fit Index (RFI), Comparative Fit Index (CFI), Normed Fit Index (NFI), Root Mean Square Residual (RMR), Root Mean Square Error of Approximation (RMSEA). The results (Table 2) show that based on

these indices the overall goodness of fit of the proposed model is very good.

The predictive power of the model can be considered as very good, since all independent factors can explain 52% of the variation of the dependent factor (purchase intention - PI). They can also explain 34% and 30% of the variations of service quality and customer satisfaction respectively.

Further, the results highlight the strong (.62) direct relationship between customer satisfaction and purchase intention, as well as the weak (.21) direct relationship between overall service quality and purchase intention. Most of the other factors of the model (except service reliability and trust) are related with purchase intention only indirectly (through their relationship with overall service quality and customer satisfaction). Therefore, one could conclude that based on the direct relationship between the factors of the model, only hypotheses H2a, H5a, H7b, H8, H9 and H10 are accepted. The other eleven hypotheses are rejected.

## 6 SUMMARY AND CONCLUSIONS

Although all the factors included in the proposed model have been studied by different researchers, it is the first time that their combined effect on Customers' Satisfaction and their Purchase Intention is examined in one paper. Also, it is the first time that their effect is examined in a country where capital controls have been imposed. These are the two main factors that distinguish this research from other similar researches.

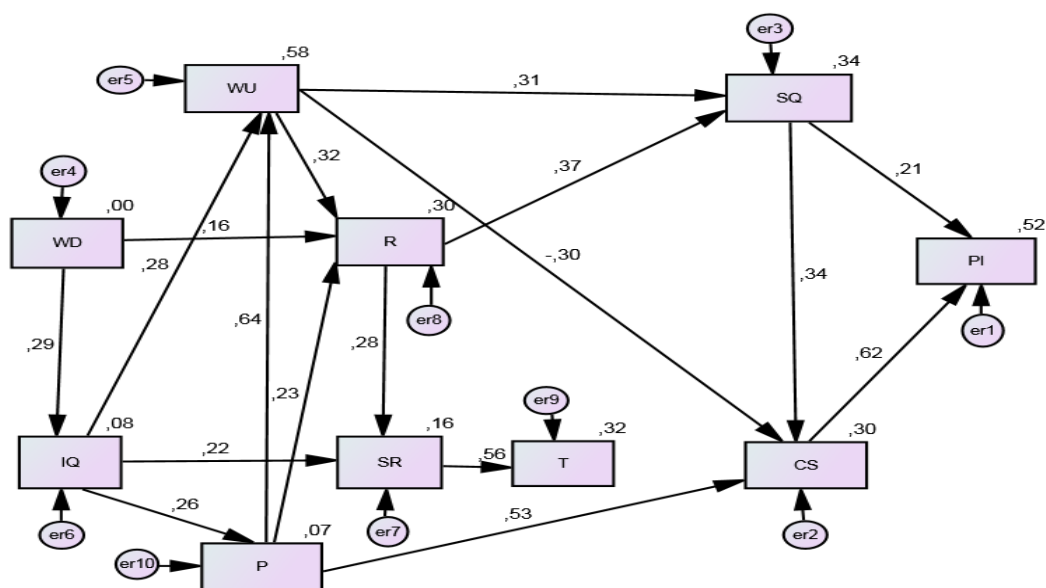


Figure 1: The SEM Model.

Table 2: Indices indicating goodness of fit in SEM.

CMIN/DF	RFI	CFI	NFI	RMR	RMSEA
< 5	> .900	> .900	> .900	< .100	< .100
.661	.911	1.000	.945	.000	.000

The results of this study have several important implications for managers as it investigates and identifies the quality dimensions that are essential in order to operate a quality e-shop and help to improve its performance.

The findings of this research show that more than 60% of the participants increased their purchases from e-shops after the imposition of capital controls in 2015. It seems that customer satisfaction is the main factor directly affecting purchase intention. It is important, therefore, to understand the factors that affect customer satisfaction. Based on the findings of this survey, personalization, website usability and overall service quality seem to be the main factors affecting customer satisfaction. Thus, developers should pay special attention to these factors. Of course, this does not mean that the other factors should be neglected, since they play an important indirect role.

Concluding, Greek companies, which in most of the times operate an e-shop in parallel with their physical shop, must have a clear strategy in order to offer high level of quality e-services. They must achieve this in order to have and maintain a number

of dedicated customers. The continuous evaluation of quality dimensions will help companies to focus on their target which is to provide high quality of e-services. This will allow companies to be competitive in the electronic market.

This study has limitations that are noteworthy. The size of the sample of this study is relatively small (360 participants) and cannot be considered as representative of the Greek population. Further, this study did not incorporate the actual purchase behavior in the proposed research model. However, this limitation can be considered as relatively unimportant since substantial empirical support exists between intention and behavior.

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