Investigation of the factors affecting the quality of electronic-services of the University of Tehran website (Measuring the pattern of electronic services on the University of Tehran website)

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Abstract

This research examines the model of electronic services at Tehran University. The effect of Information-Task Fitness, Interactivity, Trust, Accountability, Design and Innovation, Direct Perceptual Ability, Coherent Communication and Task Processes has been investigated on the quality of electronic services. This research is a case study and a survey. The reliability of the research questionnaires has all been verified. Similarly, the validity of the questionnaires has been confirmed by experts. This research has eight hypotheses that examine the impact of Information-Task Fitness, Interactivity, Trust, Accountability, Design and Innovation, Direct Perceptual Ability, Coherent Communication and Task Processes on the quality of electronic services (website) of the University of Tehran. All hypotheses were confirmed. All of the aforementioned factors have a moderate or significant impact on the quality of electronic services in the University of Tehran website.

Keywords: Quality of services, electronic services, University of Tehran, website, quality of electronic services.

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1. Introduction

Since almost all the today's organisations need to compete in various areas, providing quality services has a significant effect on achieving a sustainable competitive advantage. Companies and organisations have to provide quality services to customers in order to survive and succeed in the highly competitive markets. Experience has shown that improving customer service leads to increased profitability in companies. Companies that provide service beyond the expectations of their customers often have more loyal customers. In fact, changing the pattern from industrialism to customer orientation has put the quality of services in the spotlight which has led to growth and profitability.

To understand the quality of service, there should be a clear understanding of the concepts of quality and service. Quality is defined as the degree to which customers' needs are met, which is associated with organisational culture (Alwani & Riahi, 2003, p, 61).

The concept of quality has been defined from different approaches and perspectives (Sahnei et al., 2004). Quality is a multivariate and multidimensional concept. Thoughts, values, general purposes and specific goals of each person or stakeholder form the foundation of definition of quality (Tucker 1997; quoted by Yarmohammadian, 2004).

According to Peters, quality is in the eye of the beholder or in the minds of the consumer and can be perceived according to individuals' mentality, attitudes and goals (Mohammadi, 2005). Quality is a complex concept and has several dimensions (Shields, 1999), and its definition is difficult due to implicit criticism. Among various meanings, the definition of customer-orientation in the products and services is more useful (Saheni et al., 2004).

Many distinguished definitions of quality emphasise the relationship between the quality and the customer's need and satisfaction (Zafiropoulos et al., 2005). That is why the high quality of the services satisfies most customers (Petrozulis et al., 2006), in other words, satisfaction is based on customer's expectations and perceptions of service quality (Akinaki, 2004; Christo & Sigala 2002; Sigala, 2004a; 2014b).

Quality is a set of activities, processes, actions and interactions which are presented to the customer in order to resolve their problems (Vergas & Loos, 2004).

Today, people are living in an environment that is increasingly moving towards a service-based economy. Services are no longer considered a small part of the economy, rather as the heart of value creation in the economy; on the other hand, services are not limited to banking, postal, health and education services, and most of the products we buy contain services of one sort or another. In fact, a wide range of products relies on service-oriented activities to gain competitive advantage. Contrary to some wrong beliefs about the importance of the service sector in the economy, today, the direct and indirect consequences of services in the economic sectors are considerable (Amini & Farjam, 2008).

According to what was explained above, obtaining an accurate understanding of the concept of service is necessary. Service is a complex concept that has different meanings and varies from a range of personal services to services as products (Amini & Farghad, 2008). Because of this extensiveness and complexity, during the 60–80 seconds, a wide range of definitions regarding the notion of service we presented. Some of these definitions of service are in the following paragraphs.

The term service has different meanings. In fact, service is a kind of economic activity that builds desired change in the recipient or on behalf of them at certain times and places and creates value and benefits for customers (Lavalak, 2003).

Serving is the end result that customers are demanding. Service, activity or benefit from one side to the other, which is basically intangible and does not include any property (Cutler, 2003).

Quality of service leads to customer satisfaction and loyalty, and ultimately brings profitability and guarantees the survival of the organisation (Lee & Hwan, 2005). In fact, customer satisfaction with

services and improving the quality of services by the organisation are two important indicators in evaluating the performance of the organisations (Yusin et al., 2002).

Decin and Walsh reported a significant relationship between customer service providers and customers who receive the services (Alwani & Riahi, 2003b).

The present-day organisations have to pay attention to the quality of their products and services in order to satisfy current customers, attract new customers and increase their sources of income (Soltani & Poursina, 2007).

For organisations that provide service, no concept such as quality of services can affect customer satisfaction. The quality of services in the analysis of competitors is vital. Since more than half of gross production in most countries of the world is through service sector and due to its specific characteristics (such as direct relation with customers), attention to this sector is very important (Azar et al., 2010).

The study of the events of the past decades shows that the knowledge-based economy highly emphasises the service sector and the strategies of the advanced countries are aimed at eliminating the chimera economy and the tendency to serve as a source of wealth production (Taheri Demnah, 2009). The benefits of quality services are the factor which encourages organisations to provide high-quality services. One of the direct effects of providing quality services is improving the organisation's ability to meet customer needs effectively (Jamali, 2008).

Companies and governments have tried to accelerate and facilitate service processes by utilising information and communication technology and more than ever satisfy the expectations and needs of customers and citizens. Matching the expectations with perceptions and experiences of citizens and customers about the electronic service is defined as the quality of electronic services.

In recent years, computer use which is called e-services has expanded electronically to provide effective services (Batagan et al., 2009).

E-services are provided in the form of service providing websites. Therefore, these websites need to pay more attention to improve the quality of their electronic services in order to be more competitive (Young & Feng, 2004). In other words, online service providers must identify customer expectations to assess the quality of e-services and improve their performance according to these expectations (Ho, 2009).

Electronic satisfaction means the satisfaction of a customer with his previous purchasing experience and electronic commerce (Taylor & Todd, 1995).

Electronic satisfaction is the level of customer satisfaction with the design of the site, the information or content of the site, the ease of purchasing and the security of the purchase, which means preferring an electronic company's goods or services to other companies while purchasing (Oliver, 1999).

Electronic satisfaction is the amount of customer satisfaction with the support in receiving and sending orders for goods or services, after-sales service, the cost of goods or services, the quality of website content, website speed, reliability of the website, ease of use and security (financial and personal information) (Lee & Turben, 2001).

In examining electronic satisfaction, it should be noted that electronic satisfaction is achieved by a set of factors and conditions. Wang and Huang (2002) identified seven factors as affecting the quality of service which in turn affects electronic satisfaction:

1. General feedback on website design
2. Competitive price of the product
3. Product condition
4. Delivery on time
5. Returning policy
6. Customer support
7. Customised shipping according to customer request.

In 2000, Hayes and Sizmansky suggested a model that introduced the factors of e-satisfaction as ease of purchase, site design and financial security.

Lee and Turben (2001) also found sending and receiving orders, customer service, price, website (speed, quality of content, ease of use) and security (financial, personal) as determining factors in e-satisfaction.

Mills (2002, quoted by Wang, 2003) also examined electronic satisfaction at the Midwestern University among 174 students. Identified factors that influenced e-satisfaction included interaction with the website, perceived quality of website services and perceived value of the website for the customer.

Also, Bauer and Gerther (2002, p. 5) studied the characters on the Internet, identified the determinants factors in electronic satisfaction as accessibility of information, communication structure, customisation and the integration of information and exchanges (Negahdari, 2008).

In the 21st century, global competition in the field of modern technologies has grown among countries and organisations. The inclusive expansion of educational opportunities, coupled with globalisation and information and communications technology, has created a changing environment for higher education systems around the world.

Education improves the scientific infrastructure of nations and, therefore, plays an essential role in the future. Given the importance of higher education in societies, and given the power of digital technology and the development of information, higher education is on the verge of a revolution. In fact, the production of knowledge in the information age is a technology-intensive activity.

In today's competitive world, providing high-quality services is a necessity for service and education organisations, especially universities (Rust & Zahorik, 1993).

The ever-increasing development of communication and information technology and the increasing influence of personal computers and the global Internet network on people's life has led private companies and government institutions to consider electronic channels and digital networks to be a good tool for providing more efficient services to customers and citizens.

The development of information technology in the field of higher education, alongside an increase in the number and variety of knowledge seekers, has put the quality and satisfaction of students in the spotlight. Therefore, the correct use of communication technologies in the form of e-services in the higher education sector has been of great importance.

Quality in higher education and academic system has also been considered from different dimensions. Some scholars have suggested that quality in higher education is a complex and multilateral concept which lacks a proper and unique definition (Harvey & Green, 1993); but others define quality in higher education system by taking into account the model of organisational elements including input quality, process quality, output quality, the quality of outcomes and added value (Bazargan, 1997).

Given the changes in the global arena and, consequently, higher education, education is not acceptable with any quality, and the university, as a sub-system of higher education as a whole, should be able to play its role both inside and outside as an accompaniment factor. Today, most universities

have recognised that they can improve the quality of their educational services (Vous et al., 2007); therefore, quality is at the top of most affairs, and service improvement is one of the most important tasks of any institution or university (Salis, 1997).

Also, higher education is a kind of service because it is intangible and heterogeneous, and it is faced with the inability in matching the provider and recipient of services and their synchronisation (Kasbert, 1996).

Today, the use of e-services brings a competitive advantage in the success of organisations. On the other hand, due to the advent of new competitive topics in many Iranian universities, they are involved in a process of change in which they try to adapt themselves to these new topics and build more satisfaction for their students and customers.

On the other hand, today, higher education institutions as centers of human resource development have turned into institutions with competitive market drives. International student mobility in different educational levels at universities of the world has created a process that has caused major changes in the competitive environment for attracting students among universities (Mehregan & Nayeri, 2009).

Globalisation and internationalisation of higher education puts it in a competitive environment and increases the need for a quality guarantee system (Ferasatkhah, 2009). Consequently, the university must comprehensively measure the important outcomes associated with its customers and determine what results it has obtained in relation to its customers (Izadi et al., 2008).

In addition, with the growth of technology and information technology, general welfare has increased and higher living standards in different societies have increased awareness and expectations of customers (Hosseini et al., 2010). Increasing the use of modern information and communication technologies in all areas has led to this increase.
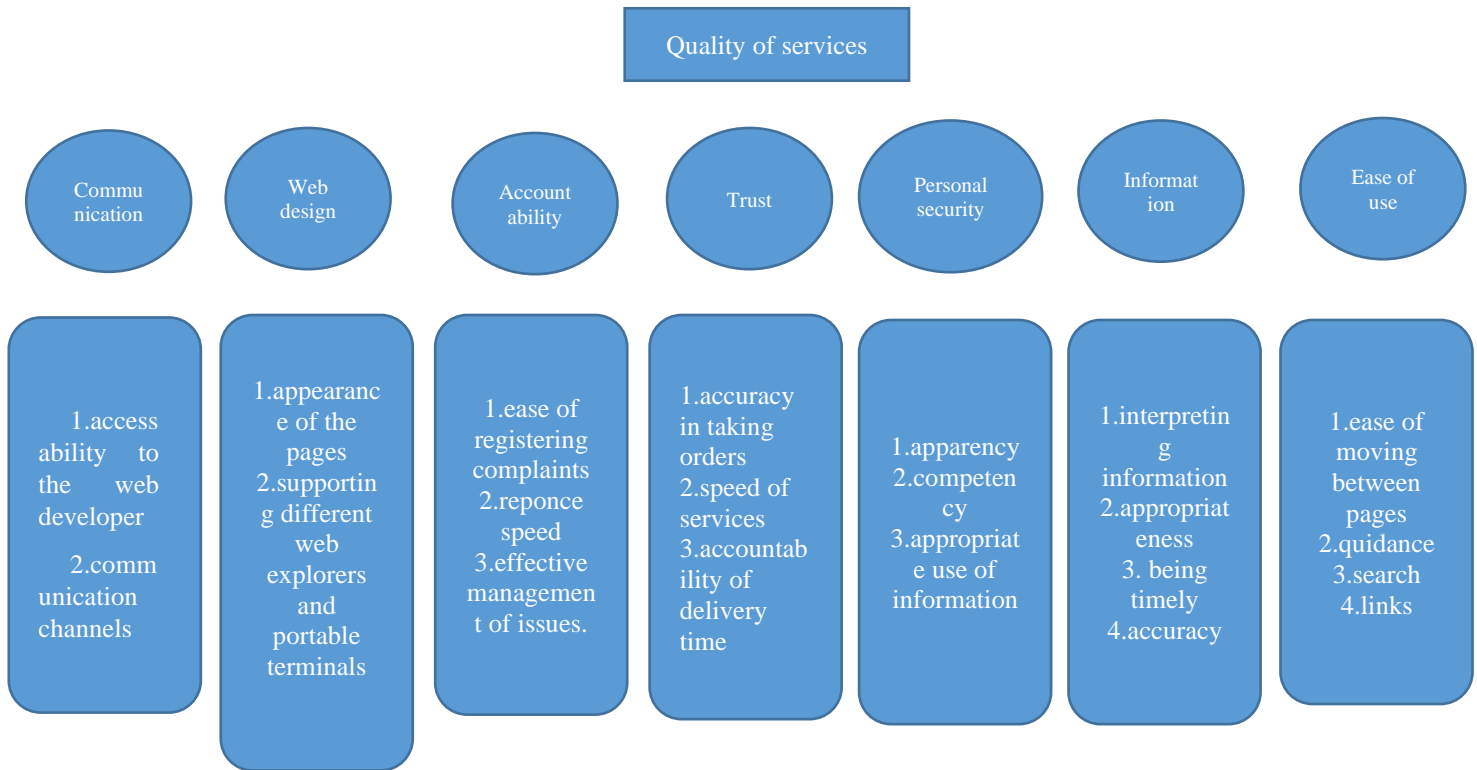
Many higher education institutions receive students' feedback about the quality of services such as libraries and websites and educational facilities to improve their current service. In this context, services provided by universities and higher education institutions are one of the most important service areas in each community, which has a unique role in the development of the society; therefore, constant attention to quality improvement of educational services seems necessary (Noorunnisaet al., 2008). In this situation, universities have been widely involved in defining the quality of services and measuring customer satisfaction with the common methods among professionals of service marketing. Universities have developed tools for measuring the quality of services since the 1980s (Grunrose, 1984).

To improve and ensure the quality of educational services and consequently customer satisfaction, standardisation of educational services is unavoidable. It goes without saying that because of the complex nature of educational services, diverse customers and a variety of customer service requirements, it is important to take into account a lot of restrictive aspects and factors. For this reason, the standard level of educational services is the agreed level by groups of customers regarding certain services (Brennan & Douglas 1998; Sarraf, 2006).

O'Neill & Palmer defined the quality of service in higher education as the difference between the services that students expect to receive and what they actually receive (Vous et al., 2007).

As some scholars have pointed out, the most important customers in higher education are typically students, their parents and university administrators, who have been progressively shifting towards customer-oriented services; therefore, the student's view of the quality of the received service from the perspective of educational planning and policymaking in higher education is very important (Konant et al., 1985; Peterson et al., 1998).

An Electronic Service Quality Model

Quality of services

Communication	Web design	Accountability	Trust	Personal security	Information	Ease of use
1.access ability to the web developer 2.communication channels	1.appearance of the pages 2.supporting different web explorers and portable terminals	1.ease of registering complaints 2.reponce speed 3.effective management of issues.	1.accuracy in taking orders 2.speed of services 3.accountability of delivery time	1.apparency 2.competency 3.appropriate use of information	1.interpreting information 2.appropriateness 3. being timely 4.accuracy	1.ease of moving between pages 2.quidance 3.search 4.links

By Roland and Oyssalo
Figure 1. An electronic service quality model

This model includes 7 dimensions and 22 indicators:

Ease of use: it is one of the most important factors in measuring the quality of electronic services and to evaluate it, indicators such as ease of access to information, search and ordering has been used.

Quality of information: this factor addresses the comprehensiveness, accuracy and timeliness of the website.

Privacy and security: it refers to the risks that a user or client is exposed to in the process of working with a web site.

Reliability: this determines the accuracy of the order, the service and the delivery time.

Accountability: includes ease of registration of complaints, speed of response and management of problems.

Web design: website appearance, loaded pages and file support.

Communications: all channels of accessing the web creators.

The E-RecS-qual model is based on the QFD system, which is a tool for identifying and voicing the customers' opinion in stages of development and application of the product or service.

Table 1. Quality of electronic services

Dimension	Items	Writer
Ease of use	− Easily linking to other pages − Fast loading of pages − Accessibility − Access to use instruction − Ease of use without knowing any special knowledge	Daphuller (1996); Cox and Dale (2001); June and Kai (2001), One of the dimensions of E-S-qual from the perspective of China Air Wang et al. (2012); Fossnat and Kose (2006); Khalid Ataleh (2012); Malhotra (2002); Parasuraman (2000); Santos (2003); Yang et al. (2003); Zaithehlam (2000); Zavare et al. (2012)
System accessibility/trust	− nonstop availability − pages don't freeze − the possibility of tracking the interactions − promised services get done in time	Daphuller (1996), One of the dimensions of E-S-qual from the perspective of Chang Ho et al. (2011); Cox and Dale (2001); Field et al. (2004); Fossnat and Kose (2006); Hongxiu et al. (2007); June and Kai (2001); Kim et al. (2006); Lee and Lane (2005); Maddo and Maddo (2002); Malhotra (2002); Mellon (2004); Parasuraman (2000); Santos (2003); Surzhadaja et al. (2003); Wolfinayarger and Jilli (2002 and 2003); Yang and Jun (2002); Yang et al. (2004); Yang and Feng (2004); Yin and Leo (2008); Zaithehlam (2000).
Contact/accountability	− fast noticing after a deal is made − fast rectifying the customers' problems − noting and immediate help in a faulty deal	Daphuller (1996), One of the dimensions of E-S-qual from the perspective of Cheng Hu et al. (2011); Cox and Dale (2001); Hongxiu et al. (2007); Jonaris et al. (2005); June and Kai (2001); Khalid Ataleh (2012); Kim and Stuel (2004); Kim et al. (2006); Long and Mellon (2004); Maddo and Maddo (2002); Oswid et al. (2009); Parasuraman (2000); Santos (2003); Surzhadaja et al. (2003); Wolfinayarger and Jilli (2002 and 2003); Yang and Feng (2004); Yang and Jun (2002); Yang et al. (2003); Yen and Lev (2008); Zaithehlam (2000); Zavare et al. (2012)
Website design/customisation	− clear and understandable information − updating information and news − appealing appearance	Chang Ho et al. (2011); China Hu Wang et al. (2012); Christyall et al. (2007); Cox and Dale (2001); Daphuller (1996); Field et al. (2004); Joanrice et al. (2005); June and Kai (2001); Khalid Ataleh (2012); Kim and Stuel (2004); Kim et al. (2006); Lee and Lin (2005); Leviaconu et al. (2002); Long and Mellon (2004); Maddo and Maddo (2002); Oswyd et al. (2009); Surzhadaja et al. (2003); Wolfinayarger and Jilli (2002 and 2003); Yang and Feng (2004); Yang and Jun (2002); Young (2001); Young et al. (2003); Yu and Dosso (2001)
Guarantee/keeping personal information safe	− having a good reputation − Compensation − doing safe deals − keeping customers' personal information safe	One of the dimensions of E-S-qual from the perspective of Chang Ho et al. (2011); China Hu Wang et al. (2012); Cristobal et al. (2007); Field et al. (2004); Hong Kongo et al. (2007); Jonaris et al. (2005); Khalid Ataleh (2012); Kim (2006); Kim and Stuel (2004); Long and Melon (2004); Maddo and Maddo (2002); Oswyd et al. (2009); Parasuraman (2000); Yang et al. (2004); Yin and Leo (2008); Yo and Dosso (2001); Zaithehlam (2000); Zavare et al (2012)

Table 2. Perceived quality of service

No.	Writer	No. of sample	Dimensions of perceived quality by students
1	Hill (1995)	62	Teaching method, engaging students in the course, educational counseling, specialty (experts appointed in university jobs), welfare, library services, presence of book shops in the university, job placement services after graduation, social involvement, financial services (student loans), health care services, providing dormitories, building and supporting student clubs, food services, physical education and traveling and entertainment services
2	Cetar and McNeill	109	University and non-university dimensions including consistency, tangible cases, accountability, trust, sympathy, knowledge and communication
3	Kiyousbert (1996)	134	Accountability, sympathy, trust, tangible cases, and consistency
4	Athiyaman (1997)	497	Educational capacity, instructors' availability, library services, computer equipment, class capacity, content of the courses in university, amount of assignment assigned to students, entertainment equipment
5	Lee Bolentz and Anguinine (1997)	388	Relationship with personnel and faculty members, university reputation, physical facilities, content of courses, accountability, access to facilities
6	Ford (1999)	616	Educational calendar, reputation of the educational institution, physical and entertainment facilities of the university, providing educational opportunities in higher levels, geographical place and ease of access to the university, other effective aspects such as influence of family and coworkers on the university and word of mouth advertisement
7	Oldfield and Barron (2000)	323	Necessary elements, acceptable elements, functional elements
8	Hem Wahidouk (2003)	209	Trustworthiness, accountability, guarantee, sympathy, tangibles
9	Sahayel and Shayekh (2004)	310	Relationship with the personnel, physical equipment of the university, university reputation, accountability of the university staff, access to facilities, educational calendar
10	Lacrosne (2004)	264	Cooperation with industry, educational calendar, internal assessment (student surveys), computer equipment, ease of access to library resources
11	Rosell (2005)	43	Quality of education abroad, facilities/educational environment abroad, language improvement/learning, language learning facilities, verification of the foreign university degree after graduation, family influence, homesickness, schools' support of foreign education, providing educational counseling, university support
12	Joseph (2005)	450	University staff behaviour, entertainment activities, university facilities, dormitory environment, reputation, expenses, support and introduction of family/friends, university size, university courses
13	Kav (2007)	223	Quality of communication quality of physical environment, quality outcomes
14	Abolhassan (2008)	200	Tangibility, accountability, trustworthiness, guarantee and sympathy
15	Cooke et al. (2010)	458	Relationship with staff, library quality, access to educational/university facilities, courses, accountability of educational staff, taking credit from higher educational institutions, holding scientific programs, level of entertainment and social activities, tuition

2. Methodology

Based on the purpose, this study is an applied research. On one hand, because the theoretical foundations of this research are gathered from the library resources, and on the other hand, because the information necessary to test the hypotheses are gathered through the field questionnaire, and according to the place of the study, the current research is a field study. It can also be claimed that this research is a descriptive survey case-study based on the method. The reliability and validity of the research have been both verified and confirmed.

This research examines the model of electronic services at Tehran University. To do this, we first describe the descriptive characteristics of the variables and then, using appropriate methods and tests, the effect of Information-Task Fitness, Interactivity, Trust, Accountability, Design and Innovation, Direct Perceptual Ability, Coherent Communication and Task Processes on the quality of electronic services will be analysed.

3. Reliability

Reliability or consistency is one of the technical features of any measuring instrument. The concept of reliability is the extent to which a particular instrument yields the same results under similar circumstances. Among the definitions that are given for reliability, the definition given by Ibell and Freisby (1989) is worth mentioning: 'The correlation between a set of scores with another set of scores in an equivalent test which is obtained independently from a group of subjects.' Usually, reliability ranges from zero (no relationship) to +1 (full relationship).

Different methods are used to calculate the reliability coefficient of a measuring instrument. For example, we can refer to Cronbach's alpha, which is described as follows. This method is used to compute the internal consistency of the measurement tool, such as questionnaires or any test that measures an attribute. In these instruments, the answer to each question can be set to different numerical values. The zero value of this coefficient indicates the lack of trust and + 1 indicates that it is fully trusted (Sarmed et al., 1997).

In the next section, the reliability of the questionnaire is examined using Cronbach's alpha coefficient. The obtained Cronbach's alpha value of the questionnaire was equal to 0.874, which indicates a high reliability of the questionnaire.

The questionnaire for measuring the electronic service model has several components. Cronbach's alpha coefficient for this questionnaire is presented in the following table. According to the obtained values, the reliability of all components is at a high level.

Table 3. Reliability of the components of the questionnaire using Cronbach's alpha coefficient

Component	Question No.	Number	Cronbach's alpha
Information-task fitness	1 to 3	3	0/729
Interactivity	4 to 6	3	0/877
Trust	7 to 9	3	0/801
accountability	10 to 12	3	0/777
Design and innovation	13 to 15	3	0/617
Direct perceptions ability	16 to 18	3	0/907
Coherent communication	19 to 21	3	0/68
Task processes	22 to 24	3	0/906

4. Validity

The purpose of validity is to answer whether a measurement tool can really measure the attribute and property that it was designed to measure or not. In other words, the concept of validity addresses the question of how well the instrument measures the desired attribute. Without knowing the validity of a measuring instrument, the accuracy of the obtained data cannot be guaranteed. Also, a questionnaire that does not cover all aspects of the subject under study does not have sufficient validity. Therefore, what validity shows is that the scale and the content of an instrument or its questions measure the variables and the subject of the study accurately.

There are several methods for assessing the validly including the face and content validity. The face validity indicates whether the questions are seemingly valid in terms of appearance and how much the concept it purports to measure. In order to assess the face validity of the questionnaire, after designing the questionnaire under the supervision of the instructor and experts in the field, the questionnaires were examined by a statistic expert to examine the alignment of the questionnaire's questions with the hypotheses of the research. Content validity describes how much an empirical tool covers the content domain of a concept. In order to ensure content validity, throughout the designing of the questions of the instrument, it should be considered that the questions represent the parts of the selected content. To assess the content validity, the experts and specialists in the field were asked to give their opinions and views, and accordingly, by the guidance of the instructor, the validity of the questionnaires was confirmed.

5. Assessing the normality of the variables

Before starting the statistical tests and inferring from the data, we investigate the normal distribution of the main variables of the research (mean scores of the components). To do so, the Shapiro–Wilk test was used, the results of which are presented in the following table.

Table 4. Assessing the normality of the variables

Variable (component)	Test statistic	*p*-value	results
Information-task fitness	0/904	0/014	Non-normal
Interactivity	0/97	0/574	normal
trust	0/77	0/001	Non-normal
accountability	0/832	0/001	Non-normal
Design and innovation	0/855	0/001	Non-normal
Direct perceptions ability	0/911	0/021	Non-normal
Coherent communication	0/856	0/001	Non-normal
Task processes	0/955	0/266	normal

Given that for Interactivity variables and Task Process, *p*-value business processes greater than 0.05, these variables have a normal distribution. For other variables, *p*-value is less than 0.05. Therefore, at a significant level of 5%, these variables are not normal, and nonparametric tests such as the ratio test should be used for their analysis.

6. Findings and conclusions

6.1. Investigating the effect of the fitness of information-task fitness on the quality of electronic services in the University of Tehran

In order to investigate the effect of Information-Task Fitness on the quality of electronic services in the University of Tehran, the number of responses less than or equal to 3 (average) was compared with the number of responses greater than 3 for the average scores assigned to the component

Information-Task Fitness and using the binomial test, and the difference between the ratio of values greater than 3 was assessed with the value of 0.5. The results are shown in the below table.

Table 5. The effect of the information-task fitness on the quality of electronic services in the University of Tehran

Component	No. of responses less than or equal to 3	No. of responses greater than 3	Ratios less than or equal to 3	Ratios greater than 3	*p*-value
Information-task fitness	17	11	0/61	0/39	0/345

We know that responses less than 3 indicate low impact and responses more than 3 indicate the high impact of the Information-Task Fitness on the quality of electronic services. The ratio of values greater than 3 in the components of Information-Task Fitness is 0.39 (39%), and the lack of significance of the ratio test at the confidence level of 95% indicates that the ratio of values greater than 3 for the average respondents' answers to the questions related to this component has no significant difference with the value of 0.5. Therefore, it can be concluded that the effect of Information-Task Fitness on the quality of electronic services in the University of Tehran is moderate (not too much or not too little) because the ratio of values greater than 3 (completely agree or agree on response, or the high effect of the fitness of information with the task) compared with a value of 0.5, is not significant (*p*-value ≥ 0.05). According to the regression analysis, the corresponding beta and the influence coefficients is 0.32. The results of this study are consistent with previous findings.

6.2. Investigating the impact of interactivity on the quality of electronic services in the Tehran University

In order to evaluate the impact of interactivity on the quality of electronic services in the University of Tehran, the mean values of this index were examined. Using a One-Sample *T*-Test (since the distribution of the interactivity component was normal), the meaningful difference between the mean scores with the value of 3 (average) was tested, the following tables contain these results.

Table 6. Descriptive statistics of the interactivity component

component	No.	Mean	Standard deviation	Mean standard error
Interactivity	28	2.93	0.85	0.16

Table 7. The effect of interactivity on the quality of electronic services in the University of Tehran

Component	*t*-test	Degree of freedom (df)	*p*-value	Average difference with zero	95% confidence interval for mean difference
Interactivity	−0.443	27	0.661	−0.07	−0.4 to 0.26

For the interactivity component, the average value is 2.93, which is 0.07 units less than the value of 3, and the insignificant *T*-Test at the confidence level of 95% (*p*-value ≥ 0.05) means that the mean score of the interaction component does not have a significant difference with 3. Also, according to the 95% confidence interval, the mean difference in the population is 95% between −0.4 and −0.26, which includes zero, too. Therefore, it can be concluded that the effect of interactivity on the quality of electronic services of the University of Tehran is moderate (not too much, not too little). According to the regression analysis, the beta and the coefficient of influence is 0.36. The results of this section are consistent with previous findings.

6.3. Investigating the effect of trust on the quality of electronic services in the University of Tehran

In order to investigate the effect of Trust on the quality of electronic services of Tehran University, the number of responses less than or equal to 3 was compared with the number of responses greater than 3 for the mean scores assigned to the component of Trust. By using the binomial ratio test, and

the difference between the ratio of values greater than 3 was assessed with a value of 0.5. The results are shown in the below table.

Table 8. The effect of trust on the quality of electronic services in the University of Tehran

Component	No. of responses less than or equal to 3	No. of responses greater than 3	Ratios less than or equal to 3	Ratios greater than 3	*p*-value
Trust	6	22	0.21	0.79	0.004

We know that responses less than 3 indicate low impact and responses more than 3 indicate the high impact of Trust on the quality of electronic services. The ratio of values greater than 3 in the components of fitness of information with the task is 0.79 (79%), and the meaningfulness of the ratio test at the confidence level of 95%indicates that the ratio of values greater than 3 for the average of respondents' answers to the questions related to this component is significantly larger than 0.5. Therefore, considering that the ratio of values greater than 3 (completely agree or agree, or high effect of Trust) is greater than 0.5 and the value of this ratio is meaningful (*p*-value < 0.05), it can be concluded that trust greatly affects the quality of the University of Tehran's electronic services. According to the regression analysis, the beta and the coefficient of influence is 0.61. These results are consistent with previous findings.

6.4. Investigating the effect of accountability on the quality of electronic services in the University of Tehran

To evaluate the effect of Accountability on the quality of electronic services in Tehran University, the number of responses less than or equal to 3 was compared with the number of responses greater than 3 for the mean scores allocated to the Accountability component and using the meaningfulness ratio test, the difference of scores greater than 3 was examined. The results are presented in the table below.

Table 9. Investigating the effect of accountability on the quality of electronic services in the University of Tehran

Component	No. of responses less than or equal to 3	No. of responses greater than 3	Ratios less than or equal to 3	Ratios greater than 3	*p*-value
Accountability	7	21	0.25	0.75	0.013

Responses less than 3 indicate a low impact and responses greater than 3 reflect the high impact of accountability to the quality on electronic services. The ratio of response greater than 3 in the Accountability component scores is 0.75 (75%), and the meaningfulness of the ratio test with the confidence level of 95% indicates that the ratio of values greater than three for the mean of responses of participants to the questions related to this component is significantly larger than 0.5. Therefore, considering that the ratio of values greater than 3 (agree or completely agree) is greater than 0.5 and the value of this ratio is meaningful (*p*-value < 0.05), consequently it can be claimed that accountability has a major impact on the quality of e-services provided by the University of Tehran. According to the regression analysis, the beta and the coefficient of influence is 0.64. The results of this study are in line with previous findings.

6.5. Investigating the effect of design and innovation on the quality of electronic services in the University of Tehran

In order to investigate the relationship between the Design and Innovation with the quality of electronic services in the University of Tehran, the number of responses less than or equal to 3 (average) with the number of responses greater than 3 for the mean scores assigned to the Design and Innovation component was compared and using the meaningfulness ratio test, the difference in

ratio of values greater than 3 with a number of 0.5 was analysed. The results are shown in the table below.

Table 10. Investigating the effect of design and innovation on the quality of electronic services at Tehran University

Component	No. of responses less than or equal to 3	No. of responses greater than 3	Ratios less than or equal to 3	Ratios greater than 3	*p*-value
Design and innovation	12	16	0.43	0.57	0.572

Like it was mentioned before, responses less than 3 indicate a low impact and responses greater than 3 reflect the high impact of Design and Innovation on the quality of electronic services. The ratio of response greater than 3 in the Design and Innovation component scores is 0.57 (57%), and the non-meaningfulness of the ratio test with the confidence level of 95% indicates that the ratio of values greater than 3 for the average of responses to the questions related to this component is not significantly different with 0.5. Therefore, it can be concluded that the impact of Design and Innovation on the quality of electronic services of the University of Tehran is moderate (not too much, not too little) because the ratio of values greater than 3 (completely agree or agree, or high effect of Design and Innovation) regarding the value of 0.5, it is not significant (*p*-value ≥ 0.05). According to the regression analysis, the beta and the coefficient of influence are 0.38. The results of this study are in line with previous findings.

6.6. The effect of direct perceptions ability on the quality of electronic services in the University of Tehran

In order to investigate the effect of Direct Perceptions Ability and quality on e-services in Tehran University, the number of responses less than or equal to 3 (average) was compared with the number of responses greater than 3 for the mean scores assigned to the component of Direct Perceptions Ability and by using the meaningfulness ratio test, we examined values greater than 3 with a value of 0.5. The results are shown in the table below.

Table 11. Investigating the effect of direct perception ability on the quality of electronic services in the University of Tehran

Component	No. of responses less than or equal to 3	No. of responses greater than 3	Ratios less than or equal to 3	Ratios greater than 3	*p*-value
Direct perception ability	17	11	0.61	0.39	0.345

Responses less than 3 indicate a low impact and responses greater than 3 reflect the high impact of Direct Perceptions Ability on the quality of electronic services. The ratio of response greater than 3 in the Direct Perception Ability component scores is 0.39 (39%), and the non-meaningfulness of the ratio test with the confidence level of 95% indicates that the ratio of values greater than 3 for the average of responses to the questions related to this component is not significantly different from 0.5. Therefore, it can be concluded that the impact of Direct Perception Ability on the quality of electronic services of the University of Tehran is moderate (not too much, not too little) because the ratio of values greater than 3 (completely agree or agree, or high effect of Direct Perception Ability) regarding the value of 0.5, it is not significant (*p*-value ≥ 0.05). According to the regression analysis, the beta and the coefficient of influence is 0.33. The results of this study are in line with previous findings.

6.7. Investigating the effect of coherent communications on the quality of electronic services in the University of Tehran

In order to evaluate the effect of Coherent Communications on quality of electronics services of the University of Tehran, the number of responses less than or equal to 3 with the responses greater than

3 was compared to the average scores assigned to the coherent communication component. By using the ratio test, the ratio of the values greater than 3 was examined with the value of 0.5. The results are shown in the table below.

Table 12. The effect of coherent communications on the quality of electronic services in the University of Tehran

Component	No. of responses less than or equal to 3	No. of responses greater than 3	Ratios less than or equal to 3	Ratios greater than 3	*p*-value
Coherent communications	8	20	0.29	0.71	0.036

Responses less than 3 indicate a low impact and responses greater than 3 reflect the high impact of Coherent Communications on the quality of electronic services. The ratio of response greater than 3 in the Coherent Communications component scores is 0.71 (71%), and the meaningfulness of the ratio test with the confidence level of 95% indicates that the ratio of values greater than 3 for the average of responses of participants to the questions related to this component is significantly larger than 0.5. Therefore, considering that the ratio of values greater than 3 (agree or completely agree, or high effect of Coherent Communications) is greater than 0.5 and the value of this ratio is meaningful (*p*-value < 0.05), consequently it can be claimed that Coherent Communications has a significant effect on the quality of e-services provided by the University of Tehran. According to the regression analysis, the beta and the coefficient of influence are 0.78. The results of this study are consistent with previous findings.

6.8. Investigating the effect of task processes on the quality of electronic services of Tehran University

In order to evaluate the impact of Task Processes on the quality of electronic services of the University of Tehran, the mean values of this component were examined. Using One-Sample *T*-Test (because of the normal distribution of the component of Task Processes), we test the difference between the mean scores with the value of 3. The following tables report the results.

Table 13. Descriptive statistics of the component of task processes

component	No.	Mean response	Standard deviation	Mean standard error
Work processes	28	2.86	0.93	0.18

Table 14. The effect of task processes on the quality of electronic services in the University of Tehran

component	*t*-test	Degree of freedom (df)	*p*-value	Average difference with zero	95% confidence interval for mean difference
Work processes	−0.808	27	0.426	−0.14	−0.51 to 0.22

For the Task Processes component, the mean value is 2.86, which is 0.14 units less than the value of 3, and the insignificant *T*-Test at the confidence level of 95% (*p*-value ≥ 0.05) means that the mean score of the Task Processes component does not have a significant difference with 3. Also, according to the 95% confidence interval, the mean difference in the population is 95% between −0.51 and −0.22, which includes zero, too. Therefore, it can be concluded that the effect of Task Processes on the quality of electronic services of the University of Tehran is moderate (not too much, not too little). According to the regression analysis, the beta and the coefficient of influence is 0.36. The results of this section are consistent with previous findings.

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