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IMPACT OF A COMBINED METHOD OF SERVQUAL & FAHP ON THE PREDICTION ACCURACY OF THE QUALITY OF ELECTRONIC SERVICES OF BANKS: A CASE STUDY OF EGHTESAD NOVIN BRANCHES IN MAZANDARAN PROVINCE

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Abstract
Nowadays quality is considered as an important factor and effective in the success and failure of organizations. So all organizations, particularly service organizations, including organizations providing public services to the people should be looking to increase their service quality. In this paper is evaluation of impact of a combined method of SERVQUAL & FAHP on the prediction accuracy of the quality of electronic services of banks (case study: Eghtesad Novin branches in Mazandaran province-Iran).

Keywords: Electronic Service, Eghtesad Novin Bank, SERVQUAL & FAHP

Introduction

Nowadays quality is considered as an important factor and effective in the success and failure of organizations. So all organizations, particularly service organizations, including organizations providing public services to the people should be looking to increase their service quality because the quality is seen as a major factor that can bring strong and powerful competitive advantage to organizations (Wisniewski, 2001). It should be noted providing high quality services is not a selected competitive strategy that organization may accept it to differentiate themselves from competitors. But the quality of services is considered as a critical factor in the survival and profitability of organizations. Recent studies show that "Cost of quality" can spend between 30 to 50 percent of sales revenue in service companies. In fact, quality improvement has become to main strategies for organizations to increase their competitive strength (Brysland & Curry, 2001). Commercial success in the new global economy depends to ability of creating distinct values in product through quality in the design and manufacture and expression of these values to customers effectively. So the perceived product quality has becoming most important competition in the world of business thus the current era of business is called "quality era" (Al-Fawzan, 2005)

Moreover, the quality of service will bring several advantages: First, the quality of service leads to increase customer satisfaction and therefore loyalty and market share. Second, the

quality of service is considered an essential element in customer relationship marketing. Thus gaining competitive advantage through quality of service requires recognition of quality requirements in terms of customers (Carman, 1990).

Problem Statement

Quality in service organizations occurs during the process of service delivery and between customer and service provider. ,(Gilaninia, et ,al,2011)In fact to measure service quality, should be measured the difference between what customers feel they will receive and what really is provided. Due to the problem today quality and customer satisfaction is one of the most important aspects of the company's management and service organizations and customer orientation is the most important strategy of all organizations and companies in the world (Siddiqi, 2010). In order to provide quality services, managers must find that what are the features expected of customers of e-services? This study by reviewing the definitions, concepts and models in the field of electronic services quality try to offer solutions to improve electronic services in branches of Eghtesad Novin Bank. Decision making is one of the most basic management tasks and achieving organizational goals depends on its quality. So that in opinion of the experts Herbert Simon, the decision is main essence of management. A number of decision techniques using quantitative data are multi-criteria decision. Managers through multi-criteria decision making techniques can make rational decision considering the different criteria for decision making which sometimes are in conflict with each other. Despite the growing importance of the services sector and the importance of quality as a competitive factor, service quality concepts are underdeveloped in the field of electronic services. Since the purpose of banks is serving customers mainly, therefore the banks should be oriented service organizations. In such circumstances, measuring the quality of service must be replaced quality measurement of goods. So that now all over the world, the strategic importance of service quality provided to customers in the banking sector is increasingly recognized and customer service in some countries are considered as a strategic data for management of banks because increasing competition among banks need to better understand the role of consumers in the field of strategic marketing (Zahari & et al, 2008).

The most comprehensive model used significantly to measure quality in providing service and determine customers' expectations from service is model that called SERVQUAL by Parasuraman and et al. This concept is result of comparing customer expectations of service quality with his/her perceptions from service quality. In the field of measuring service quality in companies and institutions has been used different scales that SERVQUAL is the most known scale. Therefore, this scale will be used in this study. SERVQUAL model knowing the quality as satisfaction that in surveying customer satisfaction can be used from five major dimensions service quality as follows:

1- Reliability: Knowledge and courtesy of employees and their ability to convey trust and confidence
2- Tangibility: Existence and displays of physical facilities, equipment, staff
3- Empathy: The importance and special attention to individual customers
4- Assurance: Staff awareness and their ability to instill a sense of trust and confidence to customers
5- Responsiveness: Eager to help customers and provide immediate service (Shahin, 2006).

World today in line with developing the capabilities of the human race is moving toward more complexity. Past certain conditions is replaced by uncertain and ambiguous conditions today. In these circumstances, the decision as the most current issues was faced with many challenges in professional and personal life of people, and requires more modern techniques and methods (Agus & et al,2007).

With this change, multi-criteria decision-making techniques have been used and developed heavily in recent years. (GanjiNia H, Gilaninia S, 2013) One of these techniques is fuzzy analytic hierarchy process. Fuzzy Analytical Hierarchy Process is one of the most famous techniques of Multiple Attribute Decision Making which was introduced by Saati. When it is facing with several options and several indicators, this method can be useful. Although experts use from competencies and their mental abilities to perform comparisons, but it should be noted that traditional Analytical Hierarchy Process has not possible full reflection of human thinking. In other words, the use of fuzzy sets has more compatible with descriptions of language and sometimes vague of human and so it is better using fuzzy sets (using fuzzy numbers) predict long-term and make decisions in real-world (Khosroanjom & et al,2011).

In this paper, after to identify an important factor affecting the quality of services provided in electronic services of Eghtesad Novin branches in Mazandaran province, are done prioritizing effective factors in providing quality service using fuzzy analytical network and is provided as a strategy for the future planning of the organization in electronic banking sector. **Research hypotheses**

1- There is significant difference between quintuple effective factors of the service quality (Tangibility, Reliability, Responsiveness, Assurance, Empathy) in order to influencing quality of electronic services.
2- There is significant difference between customer expectations and their perceived service.

Methodology

This study in terms of objective is applied research and in terms of data collection is descriptive research from branch of field studies. Statistical population includes users of eservices in Eghtesad Novin bank branches of Mazandaran province. Sample size is estimated 96. Questionnaire is considered as research tool that content validity of the questionnaire of expectations and perceptions is confirmed by supervisors and advisors and directors and heads of selected branches of Eghtesad Novin Bank in Mazandaran province and is valid. Cronbach's alpha is used to determine the reliability that reliable coefficient using Cronbach's alpha is calculated 0.920. Thus questionnaires have reliability. In order to make paired comparisons to prioritize dimensions of service quality has been designed questionnaire consistent with the framework of the questionnaire of analytic network process (ANP). In this questionnaire also prepared a guide that helps responders to perform pairwise comparisons. ANP questionnaire consists of 6 parts. Validity of the sixth parts is confirmed by supervisor, consultant and expert of banking sector. To assess the reliability of Analytical Hierarchy Process is used incompatible rate which must be less than 0.1 and guarantee the reliability of the questionnaire and the model. Paired T-test and Pearson correlation coefficient are used to test the hypotheses. Data analysis of paired comparisons questionnaire is used through Fuzzy network analysis techniques by method of Chang.

Research Findings

In this section, according to the data type hypotheses of research is tested because the link between independent and dependent variables relative to each other determine accurately. In this part Pearson correlation coefficient and Paired-Samples T Test is used to test hypotheses.

To measure the internal correlation between effective variables on customers' Perceptions

Correlation coefficients between effective variables on affecting customers' perceptions were calculated before T test for each of effective variables on customers' perceptions. In connection with the factors influencing the perceptions of customers, all variables have shown strongest correlation with the perceptions of customers.

Table 1: correlation matrix between effective variables on customer perceptions

	Perceptions	Tangibility	Reliability	Responsiveness	Assurance	Empathy
Perceptions	1					
Tangibility	0.789	1				
Reliability	0.883	0.612	1			
Responsiveness	0.920	0.609	0.797	1		
Assurance	0.730	0.365	0.612	0.719	1	
Empathy	0.863	0.643	0.663	0.762	0.498	1

To measure the internal correlation between effective variables on customers' expectations

Correlation coefficients between effective variables on affecting customers' expectations were calculated before T test for each of effective variables on customers 'expectations. In connection with the factors influencing the expectations of customers, all variables have shown strongest correlation with the expectations of customers.

Table 2: correlation matrix between effective variables on customer expectations

	Perceptions	Tangibility	Reliability	Responsiveness	Assurance	Empathy
Perceptions	1					
Perceptions	0.607	1				
Perceptions	0.779	0.532	1			
Perceptions	0.831	0.351	0.577	1		
Perceptions	0.826	0.296	0.563	0.669	1	
Perceptions	0.806	0.229	0.443	0.627	0.663	1

Comparison between perception and expectations of Service quality components

Information about the service quality factors is presented in table and is determined the significance difference between mean of perceptions and customer expectations of service quality.

Table 3: to determine significance difference between mean of perception and expectations from Service quality components

components	The difference between perceptions and expectations	sd	t	df	P-value

1	-1.592	0.929	-		0.000
2	-1.347	0.964	16.967	97	0.000
3	-0.480	0.888	-13.827		0.000
4	-0.827	0.718	-5.348 -	97	0.000
5	-1.204	0.609	11.391		0.000
6	-1.194	0.668	-	97	0.000
7	-1.224	0.618	19.588		0.000
8	-1.316	0.489	-	97	0.000
9	-1.020	0.760	17.686		0.000
10	-0.755	0.704	-	97	0.000
11	-1.092	0.627	19.611		0.000
12	-0.837	0.604	-	97	0.000
13	-0.908	0.576	26.649		0.000
14	-0.439	0.593	-	97	0.000
15	-0.418	0.625	13.300		0.000
16	-0.714	0.537	-	97	0.000
17	-0.704	0.613	10.613		0.000
18	-0.867	0.468	-	97	0.000
19	-0.949	0.440	17.230		0.000
20	-0.949	0.462	-13.714	97	
21	-0.918	0.586	-15.610		0.000
22	-0.786	0.692	-7.322	97	
			-6.630 -		
			13.161	97	
			-		
			11.375	97	
			-		
			18.334	97	
			-21.370		
			-20.314 -	97	
			15.506		
			-	97	
			11.234		
				97	
				97	
				97	
				97	
				97	
				97	

As it can be seen the P-value of all the components of the service quality is less than 0.05 which indicates the mean difference between expectations and perceptions of service quality is significant from component of electronic services.

Research Hypotheses Test

First Hypothesis

There is significant correlation between service quality and customer expectations in dimension of tangibility.

according to Paired-Samples T Test performed the means of each group is as follow: **Table 4: Paired-Samples T Test**

Groups	Mean	sd
perceptions	14.255	3.205
expectations	18.500	1.938

The mean difference between the expectations and perceptions of customers in dimension of tangibility is equal to -4.245 and also test value calculated is equal to:

T-value	Df	Sig
-15.031	97	0.000

Mean of expectations in dimension of tangibility has been different with average of customers' perceptions. Thus, according to the test done with significance acceptable level, this hypothesis is confirmed. For this reason, based on SERVQUAL model, due to the negative gap seen in dimension of tangibility can concluded that customers 'perceptions has been lower customers' expectations and customers are not satisfied.

Second Hypothesis

There is significant correlation between service quality and customer expectations in dimension of reliability.

according to Paired-Samples T Test performed the means of each group is as follow: **Table 5: Paired-Samples T Test**

Groups	Mean	Sd
perceptions	18.429	3.252
expectations	24.418	1.605

The mean difference between the expectations and perceptions of customers in dimension of reliability is equal to -5.989 and also test value calculated is equal to:

T-value	Df	Sig
-22.152	97	0.000

Mean of expectations in dimension of reliability has been different with average of customers' perceptions. Thus, according to the test done with significance acceptable level, this hypothesis is confirmed. For this reason, based on SERVQUAL model, due to the negative gap seen in dimension of reliability can concluded that customers 'perceptions has been lower customers' expectations and customers are not satisfied.

Third Hypothesis

There is significant correlation between service quality and customer expectations in dimension of responsiveness.

according to Paired-Samples T Test performed the means of each group is as follow: **Table 6: Paired-Samples T Test**

Groups	Mean	Sd
perceptions	14.918	2.723
expectations	18.510	1.772

The mean difference between the expectations and perceptions of customers in dimension of responsiveness is equal to -3.592 and also test value calculated is equal to:

T-value	Df	Sig
-17.973	97	0.000

Mean of expectations in dimension of responsiveness has been different with average of customers' perceptions. Thus, according to the test done with significance acceptable level, this hypothesis is confirmed. For this reason, based on SERVQUAL model, due to the negative gap seen in dimension of responsiveness can concluded that customers 'perceptions has been lower customers' expectations and customers are not satisfied.

Fourth Hypothesis

There is significant correlation between service quality and customer expectations in dimension of assurance.

according to Paired-Samples T Test performed the means of each group is as follow: **Table 7: Paired-Samples T Test**

Groups	Mean	Sd
perceptions	16.510	2.334
expectations	18.786	1.789

The mean difference between the expectations and perceptions of customers in dimension of assurance is equal to -2.275 and also test value calculated is equal to:

T-value	Df	Sig
-12.450	97	0.000

Mean of expectations in dimension of assurance has been different with average of customers' perceptions. Thus, according to the test done with significance acceptable level, this hypothesis is confirmed. For this reason, based on SERVQUAL model, due to the negative gap seen in dimension of assurance can concluded that customers 'perceptions has been lower customers' expectations and customers are not satisfied.

Five Hypothesis

There is significant correlation between service quality and customer expectations in dimension of empathy.

according to Paired-Samples T Test performed the means of each group is as follow: **Table 8: Paired-Samples T Test**

Groups	Mean	Sd
perceptions	18.398	3.299
expectations	22.857	2.581

The mean difference between the expectations and perceptions of customers in dimension of empathy is equal to -4.459 and also test value calculated is equal to:

T-value	Df	Sig
-21.729	97	0.000

Mean of expectations in dimension of empathy has been different with average of customers' perceptions. Thus, according to the test done with significance acceptable level, this hypothesis is confirmed. For this reason, based on SERVQUAL model, due to the negative gap seen in dimension of empathy can concluded that customers 'perceptions has been lower customers' expectations and customers are not satisfied.

Prioritizing quality dimensions of electronic services in EN Bank branches in Mazandaran province

This study seeks to measure and evaluate customer priorities about the dimensions of electronic service quality in branches of Eghtesad Novin bank in Mazandaran province. Due to ambiguity and uncertainty in the judgments of decision-makers fuzzy network analysis is used to compare the elements.

Prioritizing dimensions of service quality and metrics available in dimensions of SERVQUAL

In order to Prioritizing quality dimensions and its metrics, 96 completed questionnaires by clients analyzed. To enter the collected data in the software system, geometric mean of answers provided to each of the questions was calculated. Results are as follows:

Prioritizing quintuple dimensions of service quality

Table 9: matrix of paired comparisons and relative weights of 5 main dimensions

Dimensions of quality	Empathy	Assurance	Responsiveness	Reliability	Tangibility	**Relative weight**
Empathy	(1,1,1)	(0,4,0,58,0	(0,80,0,88,1,0	(1,02,1,12,1,	(0,78,0,85,1,02	**0.136**
Assurance	(1,31,1,73,2	(1,1,1)	(0,84,0,95,1,1	(0,92,1,15,1,	(1,19,1,41,1,59	**0.306**
Responsivene	(0,98,1,13,1	(0,8,1,05,1	(1,1,1)	(0,95,1,09,1,	(1,22,1,49,1,96	**0.264**
Reliability	(0,71,0,89,0	(0,6,0,87,1	(0,83,0,92,1,0	(1,1,1)	(0,89,1,12,1,37	**0.168**
Tangibility	(0,98,1,18,1	(0,6,71,0,8	(0,51,0,67,0,8	(0,73,0,89,1,	(1,1,1)	**0.126**

A consensus matrix obtained will enter Excel Software that is designed based on algorithm of developmental analysis of Chang. Output of program is weight of quality dimensions that is shown in above table.

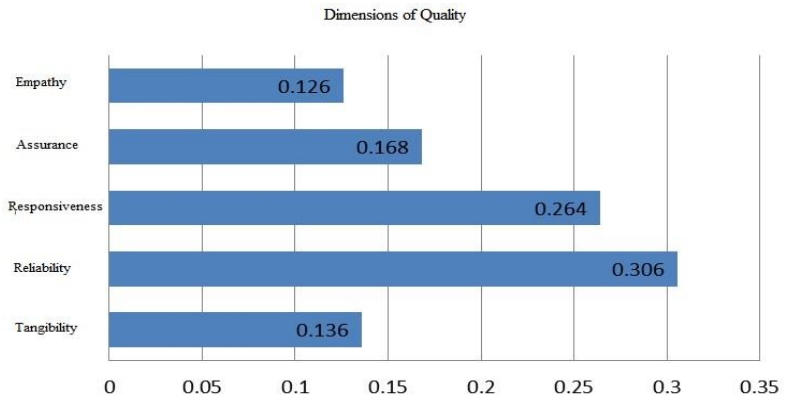

Figure 1: prioritizing quintuple dimensions of Service quality in Servqual

Discussion and conclusion

The model presented in this study is method that considering all demands of customers tries to create an appropriate balance between the level of communication with customers to increase customer satisfaction and harmonizing and integrating organizations involved to meet the needs of customers. In fact method presented in this study is synthesis of two SERVQUAL tool and fuzzy network analysis process (FAHP) to help decision-makers of banking sector that adopt appropriate strategy in the organization to provide quality services and desired for customers as well as communication with customers to increase customer satisfaction in the field of electronic services. In the proposed model to identify and assess the factors affecting the quality of services provided by electronic services in Eghtesad Novin bank branches of Mazandaran province is used SERVQUAL model and then to prioritize the factors affecting the quality of services in term of a customer view is used a fuzzy analytical network process. Using this process and results obtained banking sector decision makers can make better decisions about service delivery with better quality.

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