Factors Impacting on Customer Satisfaction in E-Banking: Some Survey Study for an Iranian Bank

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Abstract

The aim of the article is to determine the extent to which customer satisfaction's in the e-banking in Semnan area had organizational and customer readiness for developing their services. One of the most important sectors that plays key role for grasping developed condition is banking sector. Banks like other institutions also look for augmenting their profits and increasing their strength by expansion. The designing of bank must involve selection of those that have sufficient success potential. Hence, from several factors of success, the following three criteria factors have been selected-customer satisfied; one dimensional, and product fully functional. These factors offers three question multi criteria group extracted from a 16 norms. Also, three criteria factors have been studied over a period of five years and important criteria for evaluating the norms. The Analytical Hierarchy Process (AHP) has been employed to calculate the success potential of each norm. The empirical data comprises the longitudinal survey of the agricultural banking of the Semnan province. The paper, also, finds that product fully functional is placed as the first priority.

Key Words: Customer's Satisfaction, E-Banking, AHP, Iran

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1. Introduction

The aim of the study composed of questions concerning customer satisfaction's in the e-banking in Semnan area had organizational and customer readiness for developing their services. About twenty years ago, customer's satisfaction was one of the main factors and needs in the management systems and economical places (C.S.S.P.2007). Today, customers play a key role and very important work in the commercial and international board, managing the relation with client after two generation was mentioned as a long lasting relation with customers, so that the changes here help the way of doing a lot (Light, 2001). Management of customer's satisfactory , make possibilities for institutions that with moue toward a customer's – center institute, provide maximum values for customers (Skaates and Seppanen , 2002) the importance of service parts in the economics in the countries cause that along a few years ago , give useful services toward customers, give more attention (Bassi et.al, 1996). Banking Industry, Such as other industries with financial services , will face with fast changes in new technologies in market , unstable economical part , high competition , different needs of customers and variable position that making complexes of very important challenges (kumar , 2008). Here, knowing the affected factors and agents on customer's satisfaction, especially in developing countries, have special importance. kening ham et.al (2006) studied a long lasting test and analyzed un-symmetrical contact between employee and customers' satisfaction in retails. Zao & dolakia (2009), by using Kano Model and the models of multi-indicator decision-making, were determined the effects of Hi-web and Right network among chants. Baki et.al (2009) by using of a complex model of SERVQUAL an Kano that is named Quality Function Development (QFD), were studying about logistical services in Turkish. Shen & relatives (2000), combined the Kano model and GFD and expanded innovation in product. Wittle & Fandin (2005) Studied then progresses in quality indicators with Kano model. Kiey et.al (2001) by using a composed model of Kano and SERVQUAL in QFD surveyed the best services. Gole and Auzgen (2008) with a composed model of Kano, AHP and planning matrices and GFD use, analyzed the library services. Shahin (2004), with exploratory survey, had composed the Kano model and FMEA. Wang & jay (2010), in an assay which has titled "understanding the clients, needs", by quality analyze and Kano model, surveyed the clients, satisfactory. As we have seen in the past researches, compose and use of Kano model to find clients, satisfactory is important, but something that don’t regard to it, are effective factors on customers' satisfactory, on a financial institute. In this study, it tries to regard to this important point and makes priority on them by using of Analytical Hierarchy Process (AHP).

2. Literature Review

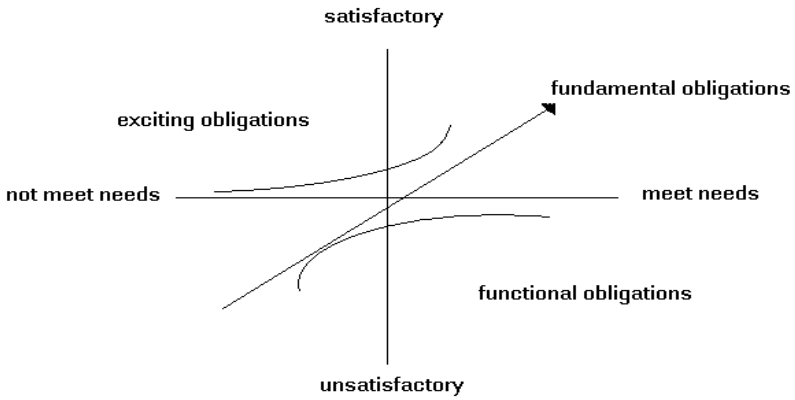
2.1 Customer satisfaction

The great searches and efforts that today is done for the sake of promotion the action management and development the client-holding idea by researchers and experts and managers of commercial foundation, shows that the customer's satisfactory is one of the most important factors to determine the institution success and one of the fundamental disturbance in commercial companies and institutes (Colgate and Lang, 2005). In the recent years of 20th century, the matter of improvement in organizational functions and recognize the amount of customer's satisfactory, is one of the fundamental needs in managerial systems and labour and work place (Winnie and Kanji, 2001). Commercial advisors in this Institutions, to the purpose to find the characteristics of institutions that their customers are always satisfies, are trying to find the ways in order to survey the customer's satisfactory and make the improved quality systems that answer the customers problems (CSSP, 2007, P.5) Banks and financial institutes are among organizations that have no exception in this area. Many famous banks around the world, making and maintaining the relations with beneficianary groups including to provide the customers and competitor's services in the international markets, put as a vignette in their managerial philosophy. Almost, all the banks in the world, to attract and protect their own customers, have preceded separated and specialized strategies and programs. With this respect, if the banks are going after a clear future, they must protect main and important clients. Customers satisfactory on bank's profitability banish the clients from competitors, encourage ore persuasion to repeat business cause improvement and increase fame, decrease costs and have a direct effects and computational Facility and have a direct to customers satisfactory and use customer-holding strategy (Fen & Lian, 2008). Since now, the banking industry have a complex and searching situation (Lovelock, 2001), and with regard to the high expansion in state com inertial banks, private banks and credit & financial institutions and improvement in their services and also progresses in technologies of banking industry, these organization are Faced with special and competition situations. One of the most important matters that banks are faced with, in the compositional situations, is increasing the amount of customer's satisfactory about institution's function and its services, because one of the most important factors in banks, success and reach to the high degree in the work, is customer's satisfactory (Newman & Cowling, 1996).

2.2 Kano’s Model

One of the economic methods to achieve customers’ satisfaction in competitive analyses in order to help correct and profound understanding the nature of Voice of Customer is Kano’s model which has been registered (Yanlai et al, 2009). Kano’s model for the first time in 1979 was presented by professor Nurbaki, lecturer at Rika University in Japan and later on he succeeded in receiving Deming Award. Kano’s model is used for classification of product based on understanding customer’s wishes and the way it affects customer’s satisfaction. In fact, Kano’s diagram shows customers’ satisfaction in relation to production level and qualitatively evaluates products (Wassenaar et al, 2005; Riviertal, 2006). Kano believes for customer’s satisfaction, organizations should make sure that the way of securing customers’

requirements affects their satisfaction and products and services should meet all of the three customers' requirements and not only what the customer states. He divided these requirements in to three groups (Chun et al, 2008) and figure 3 for better conception of these requirements is provided.



graph 1: kano model
(chun, rtal, (2008)

2.2.1 Expected (essential) Requirements

The first group of the characteristics, are essential needs which in Dr. Kano's view, the inclusion of which in the product, only prevents the customer's dissatisfaction and does not result in a particular satisfaction and content in customer. In other words, full gratification of product's essential requirements, only prepare the ground for presence of product in the market and for triumph over competitors and taking control of the product's market does not offer us any help. The customer supposes that these characteristics in product have been included in the product and in other words, these needs are unspoken and implicit.

2.2.2. Performance Requirements

The second group of qualitative characteristics is product's performance requirements the non-gratification of which causes customers' dissatisfaction and in contrast, full and proper gratification of them will result in the customer's satisfaction. Importance of product's performance requirements is in that that their identification and inclusion in product at least is an effort which protects organization's commercial position in the competitive market.

2.2.3. Attractive Requirements

Detection and specification of these requirements is difficult because they are beyond customers' expectations and hence, their absence will not cause dissatisfaction, but their presence excites the customer.

2.2.4. Kano's Model Examination

By taking customers' condition into consideration in Kano's model, there is a series of questionnaires which assess customers' condition. Next, the responses given by customers are analyzed by table 1.

Table1. Evaluation table of undesirable customers' requirements results

Suitable \ Customers needs	Have a lot of positive effect	Have positive effect	without effect	Have negative effect	Have a lot of negative effect
Have a lot of positive effect	Q	A	A	A	Q
positive effect	R	I	I	I	M
without effect	R	I	I	I	M
negative effect	R	I	I	I	M
a lot of negative effect	R	R	R	R	Q

R: Revrsed Q: dubitable I:insignificance M:obligation A: Absorb O:one-dimentional
(Qianli Xu, etal, 2009)

2.5. Fuzzy Hierarchical Analysis

Decision making process in AHP inside a modified hierarchical structure is like diagram 1. As a result, each line of hierarchical levels in AHP uses paired comparative judgments and algebraic matrix for identification and estimation of relative priorities from the criteria and options (Saaty, 1992).

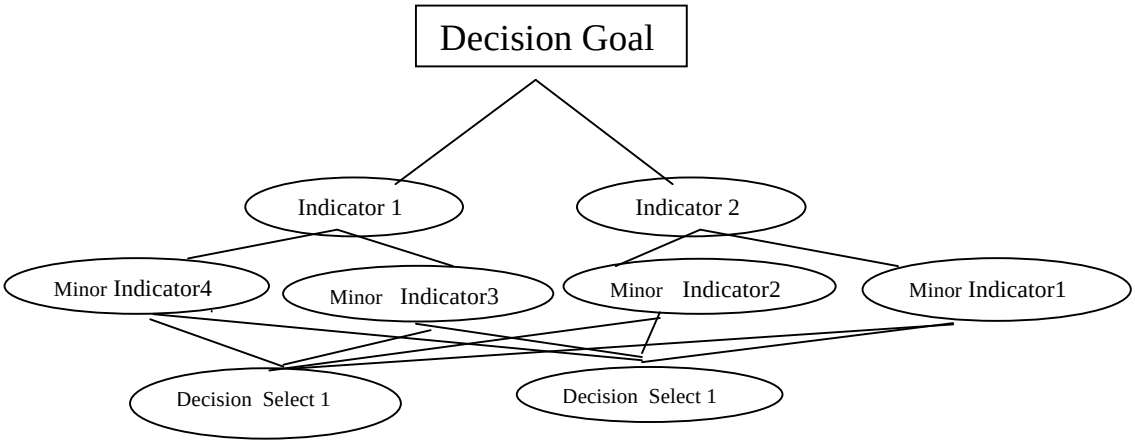


Diagram1. Hierarchical representation of decision

Diagram1. Hierarchical representation of decision issue But AHP is not able to calculate uncertainty in the time of problem evaluation and solution. To solve these problems, the extended model of AHP, i.e. Fuzzy Analysis of Hierarchical Process (FAHP) has been suggested. This method first, transforms inaccurate and vague concepts and variable in to mathematical form and then it prepares grounds for reasoning and decision making in uncertainty condition. FAHP using Fuzzy scales with high, medium and low values resolves more efficiently the problem of ambiguous and unclear decisions (Seongkon et al, 2010). Fuzzy numbers are made of membership and sets functions of the used Fuzzy in FAHP weights using AHP nine-point scale. Although FAHP needs heavy computational process, it is more systematic than other MCDM methods. FAHP takes possession of paired comparisons of options, criteria, ambiguity and unclearness of human assessments. For paired comparison of Fuzzy scales, table 2 has been used.

Table2. Trilateral Fuzzy numbers

Linguistic variables	Trilateral Fuzzy numbers
Identical / similar	(1, 1, 1)
Few / little	(2.3, 1, 3.2)
Much	(3.2, 2, 5.2)
Very much	(5.2, 3, 7.2)
Completely	(7.2, 4, 9.2)

Seongkon et al, 2010

Membership degree [μ(x)]

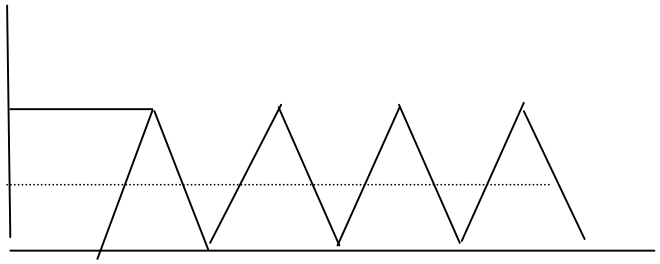


Diagram2. Transformation of lingual words into Fuzzy numbers

The used phases for FAHP are as follows:

First step: formation of paired comparisons combinatory matrix

(1)

$$Eij = \frac{1}{m} \times (E^1ij + E^2ij + \cdots + Eij$$

E_{ij} is general assessment of individual I in terms of j-index and m is number of evaluators.

Second step: for each line of paired comparisons matrix, value of S_k which itself is a triangular number is calculated as follows:

$$Sk = \sum_{j=1}^{n} \text{Mκι} \times [\sum_{i=1}^{m}\sum_{j=1}^{n} \text{Mij}]^{-1} \quad (2)$$

In which, k indicates the line's number and I and j, respectively, represent options and indices.

Third step: calculation of S_ks magnitude degree relative to each other.

(3)

$$\begin{cases} v(M1 \geq M2) = 1 & if \quad M1 \geq M2 \\ v(M1 \geq M2) = hgt(M1 \cap M2) \end{cases}$$

Also, we have:

$$\mathrm{hgt}(M_1 \cap M_2) = \frac{u_1 - l_2}{(u_1 - l_2) + (m_2 - m_1)} \tag{4}$$

Magnitude of triangular Fuzzy number from k other triangular Fuzzy numbers is obtained from the below relation:

$$v\left(M_1 \geq M_2 \ldots M\kappa\right) = \min\left[v(M_1 \geq M_2), \ldots, V(M_1 \geq M\kappa)\right] \tag{5}$$

Fourth step: calculation of indices' weight in paired comparison matrix

Fifth step: obtaining abnormal weights

(6)

$$w^{(xi)} = Min\left\{v(s_1 \geq s_k)\right\}, \qquad k = 1, 2, \ldots, n, \quad k \neq i$$

Normalization of abnormal coefficients vector (W') in order to obtain weights' normal vector (Lee et al, 2007; Lee et al, 2009).

$$w' = \left[\, w'(c_1), W'(c_2) \ldots . \mathrm{W}'(C_n)\right]\mathrm{T}$$

Sixth step: calculation of incompatibility degree

A. First, we de-Fuzzy the paired comparisons table through method of Area Center.

$$CA = \frac{(c-a)+(b-a)}{3} + a$$

B. Multiplication of De-Fuzzy matrix by vector of relative weights

WSV = D X W

C. Calculation of compatibility vector (CV): quotient of WSV on vector of indices' relative weights

D. calculation of λmax: arithmetic mean of compatible vector's elements

E. Calculation of incompatibility index (II): II = $\frac{\lambda max}{n-1}$

F. Calculation of compatibility rate: IR = $\frac{II}{IRI}$

Table3. Random incompatibility index

n	1	2	3	4	5	6	7	8	9	10
IRI	0	0	0.58	0.9	1.12	1.24	1.32	1.41	1.45	1.51

In incompatibility rate is less than or equal to 0.10 (IR ≤ 0.10), there is compatibility in paired comparisons and we can continue the work. Otherwise, decision maker should reconsider the pared comparisons.

3. Methodology

Present research, in terms of purpose is of applied type and in terms of nature and method is of descriptive-survey type. After study of library sources and articles, interview with customers, experts and connoisseurs and examination of customers' complaints, a questionnaire including 18 questions with regard to measurement of customers' requirements from electronic banking service quality has been obtained with stability coefficient. Using SPSS software, it is designed and given to the bank's customers.

The obtained responses from the questionnaire after analysis using Kano's assessment table were divided in to three mandatory, attractive and performance groups. In the second stage, hierarchical analysis questionnaire for prioritization of requirements in each group was designed and provided to commercial bank experts. Analysis of the obtained responses from the second questionnaire using data hierarchical analysis technique and Fuzzy hierarchical analysis has led to requirements prioritization in each group.

3.1. Population and Sample

Population refers to all group, people and events or things which have at least one attribute in common. In this society, statistical society includes all the customers who constantly use commercial bank electronic banking services in different branches. Cluster sampling method is used for selection of branches, so that from 382 existing branches in Semnan Province 50 first-grade branches were selected. Customers of electronic banking were selected by interview. A sample size of 454 persons using the below formula has been obtained.

(7)

$$n = (\frac{t.\sigma}{\varepsilon}\ ^{2}($$

With regard to the research's validity and stability, the necessary tests and examinations have been performed and using Cronbach's Alpha the obtained validity is equal to 0.91.

To identify the affected factors on customer's satisfaction, by using library resources, essays, books, related thesis and web network, and also views of banking experts, 16 factors are identified that are in following table (table4).

Table (4) major factors on client's satisfactory

Row	Affected factors on customer's satisfactory	Row	Affected factors on customer's satisfactory
1	Employee's responsibility in face of client	9	Building appearance
2	Good relations between employees and clients	10	Rewards and presents from bank
3	Vocational security for employees and without stress	11	Interest of payable facilities
4	Existence of money-counting and water-drinking in the bank	12	Private parking place for clients
5	Make a safe and secure place	13	The way of paying facilities (Loan)
6	Cost of piece-work wage, drafts and checks	14	Suitable ventilation devices.
7	Way of advertisement	15	Instruct the relation management with client
8	Interest of deposits	16	Discipline in the bank

These 16 Factors are divided to four factors as social factors, cultural factors, economical factors and physical factors. Thus, hierarchical tree was made as such (figure 2):

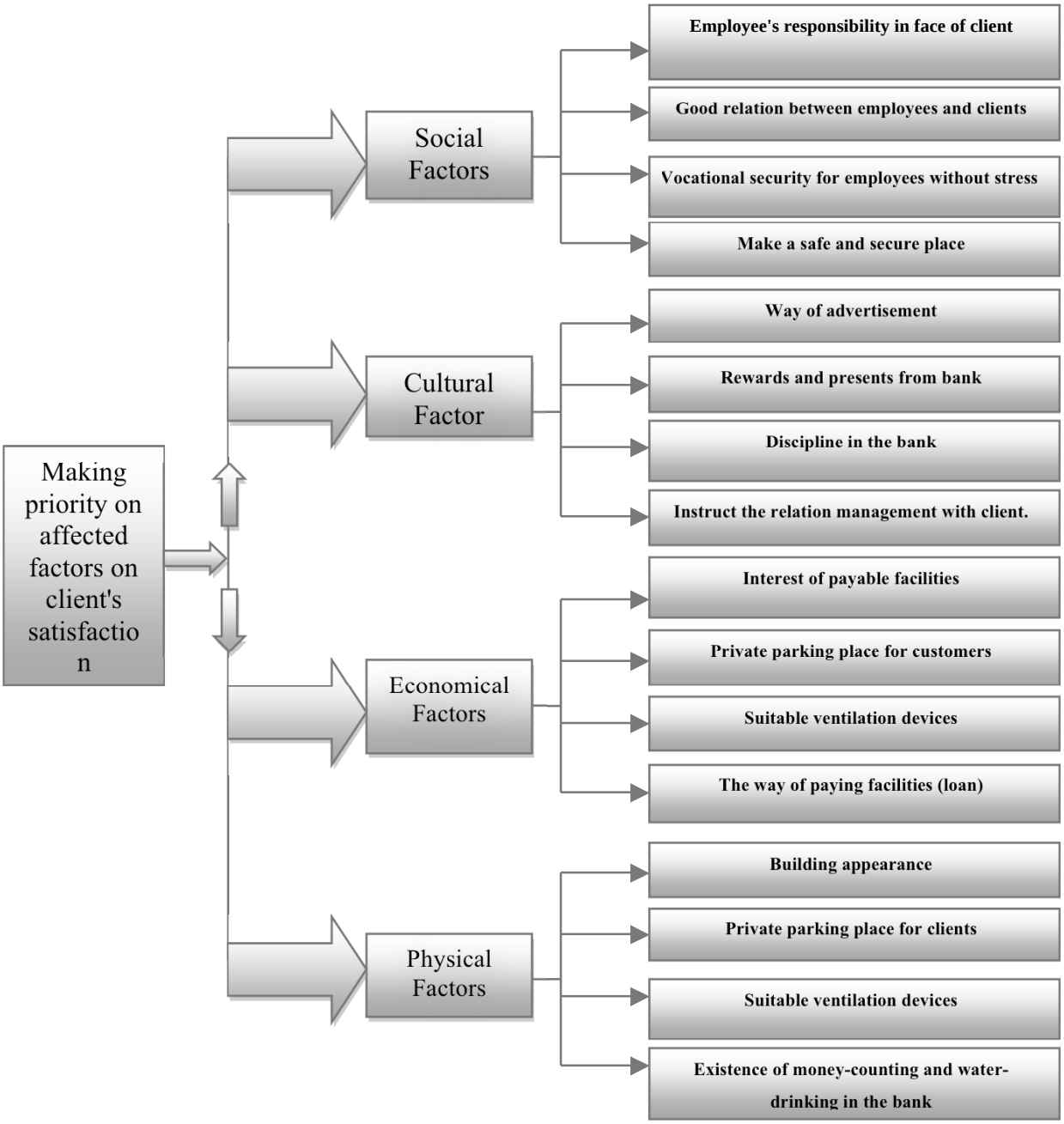


Diagram 3: AHP Decision Tree

4. Empirical Results

From 454 questionnaires which were distributed between bank's customers, 442 questionnaires were usable. In table 5, demographic attributes of Kano's questionnaire's respondents have been analyzed.

Table5. General information of respondents

Gender	Man: 326 Woman: 116	Occupation	Public service: 204 Self-employment: 112 Student: 62 Housewife: 34 Other: 30
Age	97: 18-30 years 170: 31-40 115: 41-50 60: 51 years and higher		
Education	High school diploma and lower: 65 Junior college diploma: 118 Bachelor degree: 240 M.Sc. and M.A. and higher: 19	Income	300000 Tomans and less: 26 301-500 thousands Tomans: 201 501-700 thousands Tomans: 196 701000 and higher: 19

4.1. Data Analysis Using Kano's Model

To analyze the data obtained from the questionnaire, in the firs step, Kano's method of information analysis, descriptive and inferential statistics as much as required have been used. The obtained data from this step which are gathered by Kano's method examine effect of each one of the 16 factors on customers' satisfaction and classifies these factors into three groups of mandatory, one-dimensional and attractive (Table 6).

Table 6. Classification of 16 factors according to Kano needs

Needs	Factors	Needs	Factors
Fundamental	Employee's responsibility in face of client	**Motivating**	Building appearance
Functional	Good relations between employees and clients	**Motivating**	Rewards and presents from bank
Functional	Vocational security for employees and without stress	**Functional**	Interest of payable facilities
Fundamental	Existence of money-counting and water-drinking in the bank	**Fundamental**	Private parking place for clients
Fundamental	Make a safe and secure place	**Functional**	The way of paying facilities (Loan)
Functional	Cost of piece-work wage, drafts and checks	**Fundamental**	Suitable ventilation devices.
Motivating	Way of advertisement	**Fundamental**	Instruct the relation management with client
Functional	Interest of deposits	**Fundamental**	Discipline in the bank

4.2 Prioritization of Requirements Using FAHP

For ranking the existing requirements in each class, paired comparisons were designed and offered to 5 experts of Road Maintenance and Passengers Road Transportation Organization. Next, the obtained responses from FAHP questionnaire were analyzed. The obtained results from prioritization of the existing criteria and requirements in each class are presented in tables below.

Table7. Ranking of electronic banking services' sub-criteria in FAHP environment

	W_{FAHP}	Attractive	Performance	Mandatory
Mandatory	0.543	(2.7, 3.2, 3.7)	(1.3, 1.6, 2)	(1, 1, 1)
Performance	0.321	(2.1, 2.6, 3.1)	(1, 1, 1)	(0.62, 0.77, 1.02)
Attractive	0.136	(1, 1, 1)	(0.34, 0.4, 0.52)	(0.3, 0.33, 0.43)

$\lambda = 3.05$ II = 0.02 IR = 0.04

Since in the above matrix IR = 0.04, we conclude that in paired comparison of criteria, there is an acceptable compatibility. Results obtained from FAHP method indicate that mandatory criterion is of more importance relative to other two criteria.

Table 8. Ranking the criterion with regard to Kano obligations

Mandatory obligations	**Weights**
Employee's responsibility in face of client	0. 390
Private parking place for customers	0. 311
Discipline in the park	0. 224
Make a safe and secure place	0. 154
Instruct the relation management with client	0. 139
Suitable ventilation devices	0. 101
Existence of money-counting and water-drinking in the Bank.	0. 504
Performance obligations	**Weights**
Interest of payable facilities	0. 416
Interest of deposits	0. 260
Good relations between employees 8 clients cost of piece-work wage-draft and checks	0. 259
	0. 228

Vocational security for employees without stress	0. 197
The way of paying facilities (loan)	0. 088
Attractive obligations	**Weights**
Building appearance	0. 588
Way of advertisement	0. 468
Rewards and presents From bank	0. 202

5. Conclusion

First, using Kano's model all customers' needs were divided into three groups of mandatory, performance and attractive. Next, using Fuzzy hierarchical analysis technique each requirement for prioritization was identified in each class. After specification of the existing priority in each class, final ranking and of customers' requirements was determined and the obtained results from final prioritization are as following.

First Factor: employee's responsibility in face of customer is on the fundamental obligation groups and it means that if employees work smith more responsibility sense face to clients, then the clients will be more satisfied. This factor among 16 Factors is as a factor 4, and among fundamental groupies factory.

Second Factor: good relations between employees and customers, is on the functional obligation group, and it means that if employees appear with more respect toward customer, they will be more satisfied. This factor among 16 factors is factor 7 and in the functional obligation group, is factor 3.

Third factor: vocational security for employees and be without stress, is among the functional obligation group and it means that prevent of negative excite and having relaxation, cause that customers will be more satisfied. This factor among 16 Factors, is as a Factor 11, and among functional obligation group, is factor 5.

Fourth Factor: Existence of money-counting and water-drinking is on the fundamental obligation groups and it means that the customers are behind after more welfare and potential facilities can provide their willing mess. This factor among 16 factors is factor 16, and in the fundamental obligation group, is factor 7. This factor has less importance among all other factors.

Fifth Factor: make a safe and secure place is on the fundamental obligation group and it means that customer, in addition to financial and reliable problems also follow after the situation that full of different poisons and they preserved. This factor among 16 factors is tractor 12, and among fundamental obligation group, is factor 4.

Sixth Factor: cost of piece-work wage, drafts and checks is on the functional obligation group and it means that to the same extent that customers pay less to the different kinds of expenses, they will be more satisfied. This factor among 16 factors is factor 8, and among functional obligation group, is factor 4.

Seventh Factor: way of advertisement is on the exciting obligation group, and it means that effective advertisements and with high quality based on true information, cause customers stimulation and investment in the bank. This tractor among 16 factors is factor 2 and among exciting obligation group, is factor 1. This factor has deep effect on client.

Eighth Factor: interest of deposits is on the functional obligation group and it means that whatever the in tersest of deposits that invest in the bank become higher, the satisfaction will be more. This factor among 16 factors is factor 6, and among functional obligation group, is factor 2.

Ninth Factor: building appearance is on the exciting obligation group, and it means that beauty and having a good and engineering build, is an attractive factor for client that goes to the bank. This factor among 16 factors is factor 1, and among motivating obligation group is factor 2. This factor is one of the most affective factors forward customer's behaviors in the bank.

Tenth Factor: Bank's rewards and presents, is on the exciting obligation group and it means that bank's rewards and its kind and also lottery with times that they can participate on it, are satisfactory factors. This factor among 16 factors is factor 10, and among exciting obligation group is factor 3.

Eleventh Factor: interest of payable facilities, is on the functional obligation group and it means that to some extent that interests of giving loans was lower, customer's satisfactory was higher. This factor among 16 factors is factor 3, and among functional obligation group, is factor 1.

Twelfth Factor: parking place for customers is on the fundamental obligation group, and it means that most clients in the banks have transport means and because of nearness bank to main streets, there is problem of stopping and parking; therefore, having this factor to attract his attention is very effective. This factor among 16 factors is factor 5 and among fundamental obligation group is factor 2.

Thirteenth Factor: the way of paying facilities (loan), is on the functional obligation group and it means that if paying facilities from bank is done with less severity and have be easier process, will attract more attention of customer. This factor among 16 factors is factor 15, and among functional obligation group, is factor 6.

Fourteenth Factor: suitable ventilation devices are on the fundamental obligation group and it means that if the bank has better and mor5e heater and colder devices, they will be more pleased. This factor among 16 factors is factor 14, and among fundamental obligation group, is factor 6.

Fifteenth Factor: Instruct the relation management with client, is on the fundamental obligated group, and it means that if the instruction of relation management with customers become more, then they will more satisfied of these results. This factor among 16 factors is factor B, and among fundamental obligation group is factor 5.

Sixteenth Factor: disciplinary position is on the fundamental obligation group and it means that if the employees have more discipline, clients will satisfy more. This factor among 16 factors is factor 9, and among fundamental obligation group, is factor 3.

6. **Suggestions**

1- To some extent that the time passed, possibility to change some of needs, especially exciting needs to other needs, become more and higher; therefore, latter researches must be done with lower distances.
2 - Having a counseling center and making evaluation of performance team is seemed necessary in bank.
3 - The factors of clients, satisfactory were surveyed by the employees, view, because help to make better and satisfies clients.
4 - Quality and Quantity of work among employees become survey.
5- Giving model from international institutions that say the first word in the services and client's satisfactory is vital and necessary and could be the factor to full the pores

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