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The application of integration of Kano's model, AHP technique and QFD matrix in prioritizing the bank's substructions

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Abstract

The total aim of the present study is identifying and prioritizing the customers' needs through integration of Kano's model, AHP technique and QFD matrix. The participants of the study are those customers of 50 branches of Iran's banks who are using bank services. After the identification of mass model, 980 questionnaires were distributed among the clients using random sampling data collection. Also 10 sophisticated questionnaires were also used for AHP prioritization. In general, the methodology of the present study focuses on the integration of the stated three models. The first step was the identification of customers' principal needs using Kano's model. Then, these needs were prioritized using AHP technique and at the end, technical commitments were ranked through QFD matrix. Ranking of the commitments reveals that the basic requirements which should be dealt with by the organization are of the most importance to the customers. The second requirement will be the operational and the lowest rank is devoted to the motivational requirement. In the next step, QFD shows that how customers' need prioritize technical requirements. According to the result of the present study increasing the communication with clients is the most important technical requirement.

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1. Introduction

All the people accepted that competition industry intensively is increasing. Fulfillment of customer's needs through using ordinary products to obtain a protection of the market is not sufficient. The customer's need and expectations must be fulfilled and this requires understanding customers demand and need that constantly is changing. As the customers want or expect of commodity services is not always high so quality expansion do not lead to customers satisfaction. The critical issue is that what is the expectation of customers of commodity/ services and how much of that commodity/services that fulfil expectation must have high quality .Therefore quality can be defined as properties of a commodity/services that include the ability to qualitative satisfaction and figurative expression of customer's need (Hung Hsu, 2007).

The quality of services has an important role in services industry such as insurance services / bank transformation .This issues specially have particular importance in banks that have permanent relation with customers on the other hand competition is increasing between banks ,credit institution and other kind of absorption of funds, so creating competitive advantages for bank survival is necessary. In recent decades, the quality of services turn to an important research issue in organization because of its intensive relation with costs reduction , increase of profitability, satisfaction and customers loyalty and assurance of service continuity. One of the technique by which can measure the customers satisfaction and improve the quality of services is Kano's model. As the services quality is critical for obtaining customers satisfaction and survival and profitability of the organization (Shahin, & Zairi, 2009).

If the organization wants to improve their competition in very changeable and complex market must have high skill in fulfilment of customer's demands. Such skill required that the ability to produce or offering services arouse from market .Therefore outstanding operation, require systematic method to unite the commodity production decisions or offering services with customers demand QFD approach as a modern quality engineering ensure that the quality of product greatly increased at early designing stages by attention to the voice of the customers (Babayi, 2008). Actually QFD is on commodity /services designing that bring customers Satisfaction (Hwarng, & Teo, 2013).

That target of this research is identification of people's needs to consider that use bank services and to prioritize through Kano's model integration QFD matrix. Through the coefficient technical of Analytical hierarchy process (AHP) for upgrading the quality of bank services and increasing customers satisfaction and can point to secondary objectives that to be considered:

1- Determining important requirements of customers in bank.

2- Study the relative importance of each requirement.

3-Determining the requirement that need more attention and supply to improve in this research QFD matrix is used to draw the user's needs for bank service.

This analysis is guided to find users needs and the needs totally are classified. By reference

To Kano's model in order to know which needs are critical to customer's satisfaction, the level of users' satisfaction about bank service and their competition are measured and compared.

The rest of article is organized as follows:

Part 2 is checked the research record. Part 3 describe the research methodology and framework and present a total lay out of the research .Part 4 include data analysis and its result. Part 5 represent a brief pluralization and conclusion.

2. Materials and theoretical foundations

2.1. The research record

Kano's model

Dr Noriaki Kano, one of the expert of management of quality , propound a model that is used nowadays in most of customer's satisfaction patterns .According to the studies that he do in 1986 about classification of customer's need they classify in 3 categories: Basic ,performance and excitement (Sadeghi et al, 2013). Vazifedoost and Farikhan use Kano's model in a research to express the customer's satisfaction of product designing of Sanseven company. In this research by 7hypothesis the relation between product operation (basic ,operational ,motivational quality) and value of customer (expected and unexpected value) and his satisfaction and loyalty is studied that as a result performance

quality in product designing with expected value (Vazifedoost and Farikhan, 2010). Also in research by the little of classifying customers needs and analysis their behavior, by using Kano's integration model and association rules, in order to classifying the customer's need and analysis their behavior present an integration model of Kano's model and association rules. The results of this research show that customers demographics properties influence on the kind of their needs (Shahin, & Salehzade, 2012)

QFD matrix

QFD model means quality function development that also translated as quality operation development .QFD model is a tool that apply customers quality demand in different stages of product genesis and service. Saiful and Saadon (2012) have studied the influence Kano's model and SERVQUAL integration in the model of QFD to create learning model in this research first study their models and deduce that Kano's model enable SERVQUAL that centralize on interesting feature and those one are popular in innovative service. Fazli and Alizade (2008) in their research for development of new product use Kano's model and QFD .In this research by attention to the rapid development of competitive market ,on time designing of product ,marketing or services deduce the innovation features are necessary for company's survival.

Analysis hierarchy (AHP)

AHP is a method in which a complex, disintegration to smaller sections then put in a hierarchy structure .Saati in 1994 express that AHP help to disintegrate the unstructured program to hierarchy logical decision. Lee et al identify the requirement of management for designing services system by using Kamo's model and AHP (Lee et al, 2011). Momeni in a research for describe bank services in Iran combine the method s of clustering. AHP and Kano and the result of this research show that combinations of these 3 methods create empowerment technical statues, by which an organization can obtain competitive advantages through market segmentation identifying valuable customers and satisfied them (Momeni, 2006). In a comprehensive research in 2008 by Ozgen and his team, they obtain the most important needs of library users through integration of Kano's model, AHP and QFD matrix. Result of this research unfold the marketing strategies for a library in a state university that is a nonprofit organization and help the library to find its competitive location (Ozgen, 2008).

3. Research methodology

Target of this research is applied and according to nature and method is descriptive survey. In this section we express total frame work, sample and measurement of research variable.

3.1. Total framework

The target of this research is to present an improved model according to Kano's model framework to measure customer's needs. Executive algorithm of this research during systematic stages and based on scientific research method was designed. All of stages of research are in shape 1.

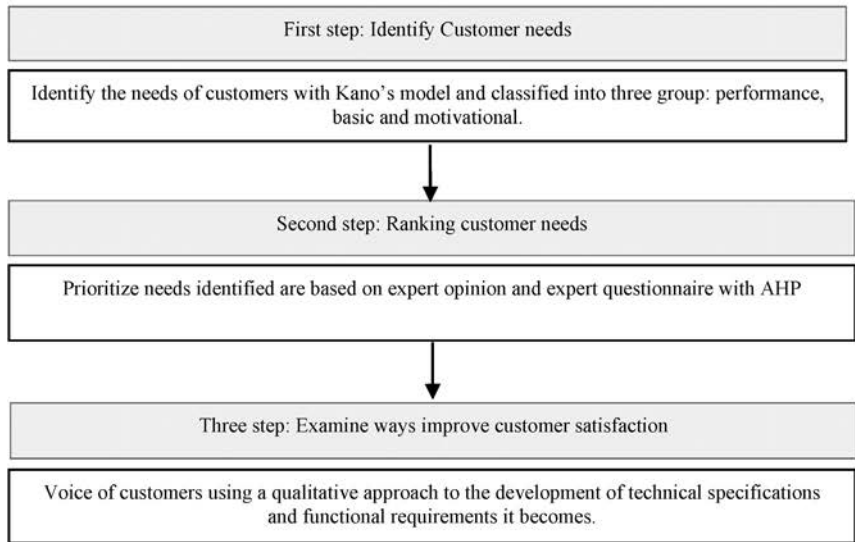


Fig 1. Total framework of research

3.2. Population and sample

In the run of this research we faced to 3 populations:

Customer’s of bank services population of AHP expert, population of QFD specialists that must selected the peoples and samples by their own special method and we will explain how to determine the size and selection.

Population of customers

The population of this research is customers of agriculture bank in Iran. We have a preliminary study and distribute questionnaires among 250 customers to determine the sample size by estimating the variance of first sample in level confidence 95%. The sample size calculated by formula 1. According to calculation 980 persons are studies as the sample size. 1200 questionnaires distribute random among the sample size and 993 of them return that 13 of them selected and deleted randomly.

$$n = \frac{Z_{\alpha}^2 \times S^2}{d^2}$$

Sampling of expert population foe AHP technique

In the second step, the technique of analytical hierarchy process is used to prioritization of criterization. Therefore the population include of expert and masters in that field of study, according to Saaty’s idea that number of expert must not be a lot as interview and totally offer 5 to 15 person, therefore 10 of experts are studied as sample (Saaty, 1989).

Formation of QFD team

When communications matrix formed must determine the relationship of each of the technical properties (HOWs) with customer’s requirement (WhATs). In order to this QFD executive team determine desired communication according to the experienced engineers and specialists. In organization, customers opinion statistical data,... so a group of 5 persons bank expert selected.

3.3. Measurement

In this research the tool for collect data is questionnaire. We use two type of questionnaire , Kano’s model and expert questionnaire .AHP respondent viewpoint collected according to 5 degree like spectrum(fully disagree to 5 fully agree).About validity of questionnaire the validity method of formal and content is used that is approved and its stability obtain 0.809 ($\hat{\alpha}>0.07$) through Cronbachs alpha coefficient that is certifiable. expert questionnaire to prioritization main criterion of selecting the method of doing the project by using techniques based paired .comparison AHP .it regulated according to Saati 9 degree spectrum and because all the criteria are consider and the designer cannot have especial orientation so that there is no need to measure validity. Analysis of date is by SPSS and enpert choice software.

4. Result

4.1. grouping the customer’s main requirement by using Kano’s model

In this study 31 variables selected as the customers main requirement. First by using the analysis method of Kano’s model, grouping needs of motivation, operational and basic specified in table 1.According to abundance was observed in the response of any questions related to customer’s main requirement and with regard to the method of requirement classification in Kano’s model, each variable status is interpretation. We can say index of ease of access and car parking from perspective of 16 person is a motivations need and from perspective of 34 person is a basic need. Also 11 person assigned this index as an apathetic. None of them assigned it as a reverse reply or ambiguous answer. So because the abundance of basic need is more than others, this variable diagnosed as a basic needs.

4.2. Prioritization of the main requirement through AHP model

Paired comparison of this 3 criteria of customers needs done based on the research target and determining weight of each criterion by special vector that identify in table 2 the criteria priority of basic, operational, motivational requirement by AHP method in enpert chois software. In consistency rate obtained for comparing main criteria that is less than 1.0 and show paired comparison is desirable.

Table1. Evaluation of customer’s need for each of them according to Kano’s model

Status	R	Q	I	O	M	A	Index
basic	0	0	11	34	37	16	Ease of access and car parking
operational	0	1	18	40	26	13	Specify various departments in the bank
operational	0	0	13	46	30	9	Appropriate sorting of branch and coordination of counters placement
motivational	1	1	23	26	13	34	information of banking services by IVR or website
basic	0	2	12	32	37	15	Supporting information of customers and avoid panellizing
apathetic	3	3	33	24	23	12	Information center in the branch and leaflet, informed person
operational	0	3	20	40	20	15	Appropriate height and status of counter
operational	1	0	14	36	32	15	Amenities (chair, banknote machine, ventilation)
basic	1	2	10	31	49	5	Appropriate security (guard , security system)
operational	1	0	9	50	33	5	Caring about the time of customers by manager of bank
basic	0	1	6	40	48	3	Proper behavior of staff
operational	1	1	4	53	39	0	Accountability of staff
basic	0	0	5	43	47	3	Caring about the time of customers
motivational	1	0	15	23	26	33	Well organized staffs
basic	2	0	14	29	46	7	Knowledgeable staffs and aware of specialty assigned
basic	0	0	7	35	44	12	Staffs with speed and accuracy in banking operation

motivational	3	1	16	29	16	33	Internet banking services
motivational	2	2	8	24	24	38	Reduction of commission currency transfers
apathetic	1	1	39	27	7	23	Opening credits of export in the bank
apathetic	0	1	43	23	11	20	Opening credits of import in the bank
apathetic	0	1	39	18	18	22	Opening internal credit in the bank- Rial
basic	0	8	14	39	15	22	Reduction of profit facilities
basic	0	1	10	47	25	14	Reduction of waiting time for received facilities
basic	1	8	13	40	12	24	Increase duration of repayment facilities
apathetic	0	1	57	16	5	19	Invitation of customers to participate in the seminar
basic	0	2	6	34	52	4	Protect the confidentiality of customers information
basic	0	1	8	31	47	11	Handling unit of complaints and criticisms
motivational	1	4	31	22	6	34	Booking turn on the phone for things that should be done in personal
apathetic	0	1	38	22	3	34	Following the news of stock ,price ,gold from that center
motivational	1	2	18	21	1	55	The use of pre-written payroll records for deposit accounts
motivational	0	1	7	20	28	42	Turn rating in branch

Table 2. The final priority of indexes by technique of AHP

rank	Normal weigh	Initial weight	index	symbol	weight	conclusion
10	0.047	0.104	Ease of access and car parking	M1		
7	0.062	0.137	Appropriate security(guard , security system)	M2		
12	0.033	0.074	Knowledgeable staffs and aware of specialty assigned	M3		
15	0.031	0.069	Protect the confidentiality of customers information	M4		
19	0.020	0.044	Handling unit of complaints and criticisms	M5	0.454	basic
13	0.033	0.074	Supporting information of customers and avoid panelizing	M6		
5	0.067	0.148	Proper behavior of staff	M7		
3	0.069	0.153	Caring about the time of customers	M8		
1	0.090	0.198	Staffs with speed and accuracy in banking operation	M9		
25	0.011	0.067	Internet banking services	A1		
23	0.013	0.074	Reduction of commission currency transfers	A2		
20	0.018	0.108	Booking turn on the phone for things that should be done in personal	A3		
8	0.050	0.297	The use of pre-written payroll records for deposit accounts	A4	0.170	motivational
9	0.048	0.283	information of banking services by IVR or website	A5		
24	0.012	0.068	Turn rating in branch	A6		
22	0.018	0.103	Well organized staffs	A7		
14	0.032	0.085	Specify various departments in the bank	O1		
4	0.068	0.179	Appropriate sorting of branch and coordination of counters placement	O2	0.376	operational
18	0.020	0.054	Appropriate height and status of counter	O3		

17	0.029	0.077	Amenities (chair, banknote machine, ventilation)	O4
21	0.018	0.047	Caring about the time of customers by manager of bank	O5
16	0.031	0.081	Accountability of staff	O6
6	0.064	0.170	Reduction of profit facilities	O7
2	0.072	0.191	Reduction of waiting time for received facilities	O8
11	0.044	0.117	Increase duration of repayment facilities	O9

4.3. Prioritization technical requirement by using QFD technique

Figure 2 showed solidarity matrix and quality home that its target is technical requirement prioritization through QFD. The most important technical requirement in this study is mechanize equipment and devices, reduction of the products and services price, performance of automation system in organization review of program and the projects technical documents, on time services of equipment and devices, (maintenance, repair), reduce the time services present on time presentation of the report by bank, automation of customers offer and complaint. The priority of technical requirement by QFD method is as present in table 3.

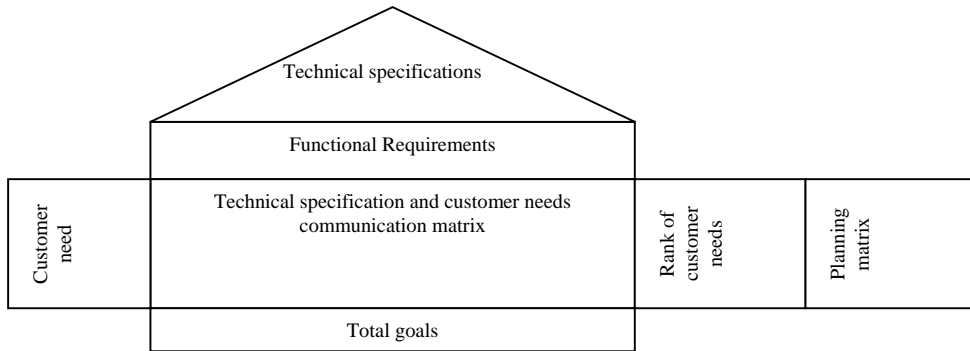


Fig 2. General view of home quality

Table3. Final priority of technical requirement

importance	weight	Technical requirement
1	0.167	Increasing communication with customers
7	0.083	Reduce the time of services presentation and product process
5	0.134	Performance of automation in organization
8	0.081	Review of programs and project technical documents
6	0.121	On the time service of equipment and devices
2	0.142	Reducing the products and services price
4	0.135	Automation of equipment and devices
3	0.138	Increasing online and internet services and facilities

5. Conclusion

The main target of this research is to identify bank customer’s requirement through integration using combination of Kano’s model .AHP and QFD matrix to realization of this target, we study agriculture bank services in Iran by using the models mentioned before. At first we identify and recognize the competitive priorities and customer’s

requirements and classify this requirement through Kano's model, then prioritize them by using analytical hierarchy and finally identify technical requirement through QFD and design quality home. The result of this research show modulation of these 3 method create a empowerment modulation .through which an organization can facilitate its competitive differentiation. According to the result of this research basic requirement has more priority .Function requirement in middle priority and motivation requirement has less priority, According to this result the basic criterion for bank's customers is basic priority and if they don't fulfill, they will be extremely unsatisfied and whether they fulfill, create any content in customers. In fact customers know this requirement as preconditions. Also about function requirement we can say the level of customers satisfaction depend on fulfillment of this requirement, it means fulfillment of this requirement cause customer's satisfaction and conversely.

6. Suggestions

It is proposed to researchers of this field can do some changes such as using modified Kano's model for prioritization customers needs using phase AHP approach and also ANP to paired comparison of priorities or using the room of competition analysis in QFD and simultaneously compare of 2 different bank develop the results of this research.

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