

Developing Two-Step Quality Function Development for Analyzing and Prioritizing the Quality of Work Life according to the Employee's Performance and based on the Customer Satisfaction (Airport Agencies as Case)

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ABSTRACT

The aim of this study is to offer a two-step quality function development for analyzing and prioritizing the quality of work life. This can be useful in increasing the customer's satisfaction through influencing and improving the employee's performance. This study was conducted in the Isfahan airport agencies. In order to conduct the study, two steps were conducted. In the first step, the service components were evaluated by the experts and were scored through comparison matrix, and finally were prioritized by analytical hierarchy process. So, key performance measures were prioritized through replacing these factors in the house of quality matrix. The primary results of this matrix indicate contacting with clients, knowledge and skill, responsibility and confidence, perception and inferential potentials, work dominance, learning potential and the effect of education, work discipline and legitimation in the workplace are the most important factors in comparison to other ones. If these factors are reinforced, then they have important role in increasing service quality and satisfying the customer's needs and expectations. In the second step, the prioritized performance measures that have been concluded from house of quality matrix in the first step were located in the model as inputs and also quality of work life factors were located in the Walton model. It was resulted from house of quality matrix that the following factors can be effective in increasing and improving the employee's effective performance and also leads to improve service quality and the customer's satisfaction.

KEYWORDS: Quality Function Development Approach, Quality of Work Life, House of Quality Matrix.

1. INTRODUCTION

In the nowadays complex competitive and dynamic world, which companies and organizations will be successful and can survive in the competitive environment that their customers are satisfied by their products and services. Also the customers are considered as the final juror of quality that the organizations survive depends on the customer's satisfaction and loyalty. Therefore, it is necessary to identify the effective factors on increasing the customer's satisfaction and also recognize the factors that lead to their dissatisfaction. Also it is considered as an effective solution to translate the plans and methods in perceivable language for the organizational managers, planners, and employees. Also which employees can produce and offer the best products and services that have higher productivity and performance. It is not possible unless by considering the employee's physical and mental needs and adapting workplaces with the employee's expectations and prerequisites.

One of the effective approaches in term of the employee's expectations and how to offer services and the products characteristics is the quality function development approach that has been conducted in this study in two steps.

Regarding the final goal of the organizations that is profitability and this is resulted from the customer's satisfaction, more concentration on their observed and latent needs and wants is the best method for achieving this final goal. Because the customer's satisfaction is the result and output of the offered product and service quality, this is necessary to examine this subject. Therefore, it is necessary to identify the effective factors and then reinforce the positive factors and eliminate the negative ones.

Previous studies

Shamsmehrabi (2011) in his study that was entitled “the quality of work life” examined the quality of work life plans and its obstacles.

Soleymani *et al.* (2009) in their study that was entitled “the role of employees in the bank customer’s satisfaction and loyalty” examined how bank employees contact with the customers in terms of the customer’s satisfaction concept and also developing and reinforcing long-term relations with them. They examined the customer’s satisfaction concept from three different aspects. In order to this, they used a multi-step process for measuring the individual’s viewpoints in terms of the above concepts. These steps include:

1. The offered services
2. The customer’s feelings
3. Process
4. Relations
5. Reliability
6. Negotiation
7. Complaints

The results of their study indicate that all of the above factors are effective in improving and reinforcing the relations with customers and increasing their satisfaction except 1 and 2.

Hemat *et al.* (2008) in their study that was entitled “examining the role of agronomy and safety in forming quality of work life” indicated that only 11% of the individuals had high quality of work life. The results of their study indicate that there are significant relationships between quality of work life and the employment status and type of job and there are not any significant relationships between quality of work life and the employee’s educational levels. The results of logistic regression analysis indicate that the justice in payments, work-life times, and agronomy and safety measure are the most important factors in the quality of work life measures. Therefore, it is necessary to attend agronomy and safety conditions for having a workplace with high quality of work life.

Porata (2008) in his study that was entitled “improving and increasing quality of work life” indicate that nowadays workplaces have problems and amazements and it is resulted from their field studies that more than 50% of the organizations’ employees do not know what is their organizational vision, 84% of them perceive that knowing organizational visions have not significant effect on their functions quality, and finally 44% of them have not any mental relation and empathy with their higher level organizational managers.

Therkhani *et al.* (2006) in their study that was entitled “offering a framework for determining the effective factors on improving the customers’ satisfaction in the internet service companies” indicate that it is necessary to identify the measures that have effects on offering products and services to their customers so that are able to direct and coordinate their company in the best manner based on the resulted information and also conduct their marketing plans based on the interested factors and characteristics of their customers. In order to this, priorities of the factors were determined by Kano method and then satisfaction of every factor was specified based on the results of analysis that was concluded by conducting a survey, described that how performance evaluation is done. The performance evaluation measures, the relationship between performance evaluation and the job evaluation and salaries, different techniques of performance evaluation, goals, place and time of the performance evaluation, and finally personality traits are the most important issues of this study.

Shahin *et al.* (2004) in their study that was entitled “a novel model for engaging the customers’ participation” combined the quality function development approach and the customer relationship management and indicated that the services, processes, products, and performance measures should be based on the customer’s needs and wants.

Rezaei (2004) in his study that was entitled “the customer’s satisfaction measure models” indicated that the customer’s satisfaction is a feeling and this feeling should be translated to quantitative form for improving its quality. The customer’s satisfaction measure models are the solutions of this process.

Farhadi *et al.* (2002) in their study that was entitled “new challenges of performance evaluation and offering an effective model for research organizations” examined the employee’s performance evaluation.

Mohamad Asim *et al.* (2008) in their study that was entitled “the application of quality function development” studied the air industries and indicated that the language of engineers and customers is different and developing the quality usage with the houses of quality matrix can translate the customer’s needs and expectations to the products and services characteristics.

Allameh (2008) in his study that was entitled “developing the Walton model of quality of work life based on the Islamic values and determining its effects on decreasing the mental problems” indicated that there are significant relationships between the components of open relations in the organization, the supervisors constancy, function evaluation according to the employee’s actual efforts, and their awareness from the manager’s performance.

Ronald et al. (2012) in their study that was entitled “following the learning and perceiving the quality of work life” indicated that the employees should change themselves for learning and improve their present conditions by developing learning strategies. They also indicated for the organizational leaders that how some of the context drives can increase the employee’s readiness for learning and improving quality of work life through re-developing and enriching their jobs.

Yang et al. (2011) in their study that was entitled “the difficulties of quality of work life plans implementation methods based on the performance quality for evaluating ecologic performance” indicated that the quality of work life can be considered as a developed method for determining the key performance evaluation measures in the ecologic context.

Alahasan et al. (2010) in their study that was entitled “the process of conceptual planning: improvement method by using FMEA, QFD, and ABC” combined the quality function development approach based on the conceptual costs for determining the key resources of process and predicting the construction costs and also by considering error costs of the trend.

Simesnar et al. (2010) in their study that was entitled “the relationship between work family conflicts and life quality: researches about the role of social supportiveness” studied a comprehensive model for investigating the relationships between work family quality, and quality of work and non-work life and finally resulted that there is significant relationship between work family conflict and quality of work life.

Karovali et al. (2010) in their study that was entitled “developing software for minimizing the problems of quality of work life” indicated that the main problem that should be resolved is the house of quality matrix and also offered a conceptual model for quality function development and for minimizing the conceptual problems.

Oliziror (1990) in his study that was entitled “the quality cycles and work life” indicated that there is significant relationship between the employee’s participation in the quality cycles and different aspects of quality of work life.

It is should be remembered that any study has not conducted for developing a two-step quality function development for analyzing and prioritizing different components of quality of work life according to the employee’s performance and the customer’s satisfaction in the airport agencies to now and so it is seemed that conducting a such study will be useful.

Research frameworks

Services quality and customer satisfaction

Because this study is in terms of increasing quality of the offered service and increasing the customer’s satisfaction, much of this study’s focus is on the renderer resource of services that is employees and their performance based on the performance measures can influence the customer’s satisfaction directly. It is seems that considering the effective factors on the employee’s performance is very important function. Therefore, it is possible to identify, classify, and prioritize the key effective factors on the quality of work life for increasing and improving the backgrounds of quality of work life, performance productivity, and the customers’ satisfaction.

Satisfaction: refers to a positive feeling that is created after using a product or receiving a service. This feeling is created as a result of contrasting the customer’s expectations and the suppliers’ performance.

Customer satisfaction: is a positive feeling that created after using a product or receiving a service. This feeling is created as a result of contrasting the customer’s expectations and the suppliers’ performance (Rosta, 2010).

If the received product or service by the customers is equal with their expectations, this leads to satisfaction feeling; on the other hand, if the received product or service by the customers is more than their expectations, this leads to their satisfaction; and finally if the received product or service by the customers is less than their expectations, this leads to their dissatisfaction. The level of satisfaction and dissatisfaction is different in different times and conditions and usually refers to the extent of the distance between the customers’ satisfaction and the supplier’s performance in terms of product and service quality (Rosta, 2010).

Therefore, if the customer’s expectation is satisfied in the best manner, this will results in the customer’s more satisfaction and their happiness. The most important indicators of the customers’ satisfaction include the customers’ needs and wants, believes, previous experiences in relation to this supplier and other ones, received viewpoints by the customers from their relatives and friends about the service, the promotional factors that are about the customers’ conditions, and the next step is designing the product and service based on the customers’ needs and wants that can be done in different methods. One of these methods is prioritization of the needs based on the house of quality matrix with the quality function development approach. With respect to that intangibility of service and simultaneity of its production and consumption are the most important aspects of the services, other aspects and characteristics of the services quality include:

- **Reliability:** includes service appearance, stability, accuracy, and delicacy
- **Accountability:** includes tendency for helping the customers, readiness, and convenience
- **Timely accessibility**
- **Safety and security**
- **Communications**
- **Offering services**
- **Customers recognition:** perceiving, attending, and satisfying the customers satisfaction
- **Validity:** includes reliability, honesty, and reputation
- **Tangibles:** includes appearance, instruments, facilities, and physical equipment
- **Courtly:** includes attending the customers and empathy
- **Competency:** includes the knowledge and skill
- **Flexibility in time and content**
- **Price:** includes the economically and discount

Performance evaluation

From vocabulary perspective, performance refers to status or quality of the performance. Therefore, organizational performance is an overall construct that refers to how the organizational performance is done. The most famous definition of the performance was offered by Nili *et al.* (2008). They refers that it is the process of explaining quality of the previous efforts efficiency and effectiveness. Based on this definition, performance can be divided into two components that include efficiency and effectiveness. The first is explanative of how the organization uses its resources in production and service offering. This refers to the relationship between the actual and favorite combination of inputs for producing the defined outputs. The second explains the rate of organizational successfulness (achieving goals) (Rahnavard, 2008).

Performance evaluation: is the process of measuring the performance that is done based on the strategy-related measures and also comparing them with the predetermined measurement standards.

Performance measure: the key performance measures include the financial and non-financial measurement criterions that are used for determining quality of the goals and reflect the organizations strategic performance (Ansarian, 2010).

These measures are considered as values and the performance measures that are related to the organizations strategy (for example through techniques such as scored evaluation cards). This is a model that suggests to uses the scored measures for measuring the organizations performance and it is necessary to consider the financial, customer, internal process, and learning and growth (Kaplan *et al.*, 1996).

The important and key points in determining the measures were indicated in the following section.

- Primarily defining the business activities
- Having the clear operational goals from business necessities
- Having both qualitative and quantitative criterions from the results and comparing them with the overall goals
- Examining the variances and developing the steps or resources for doing short-term goals

Quality of work life

Quality of work life refers to the amount of the employee's perception from physical and mental hygiene in the workplace (Kasio, 1995). Based on the Walton model, dimensions of the quality of work life include sufficient and just payment, safe and secure workplace, secure the growth opportunity and continuous security, legitimation in the organization, social belonging of the work life, overall work area, social integration, and human competencies development.

Therefore, it is possible to identify the prioritized components of quality of work life by houses of quality matrix and then strive to its improvement.

Quality function development

Quality function development approach: is the method of designing the products and services based on the customers' needs and expectations through prioritizing the needs based on the house of quality matrix (Motaghi, 2008). Quality of function development also identifies the improvement path for the specific parameters but cannot offer the precise amount of the improvements and values (Bouchereau *et al.*, 2000).

House of quality matrix: is the method of prioritizing the needs and expectations from the customers' perspective and transforming them to the dimensions of product designing (Motaghi, 2008).

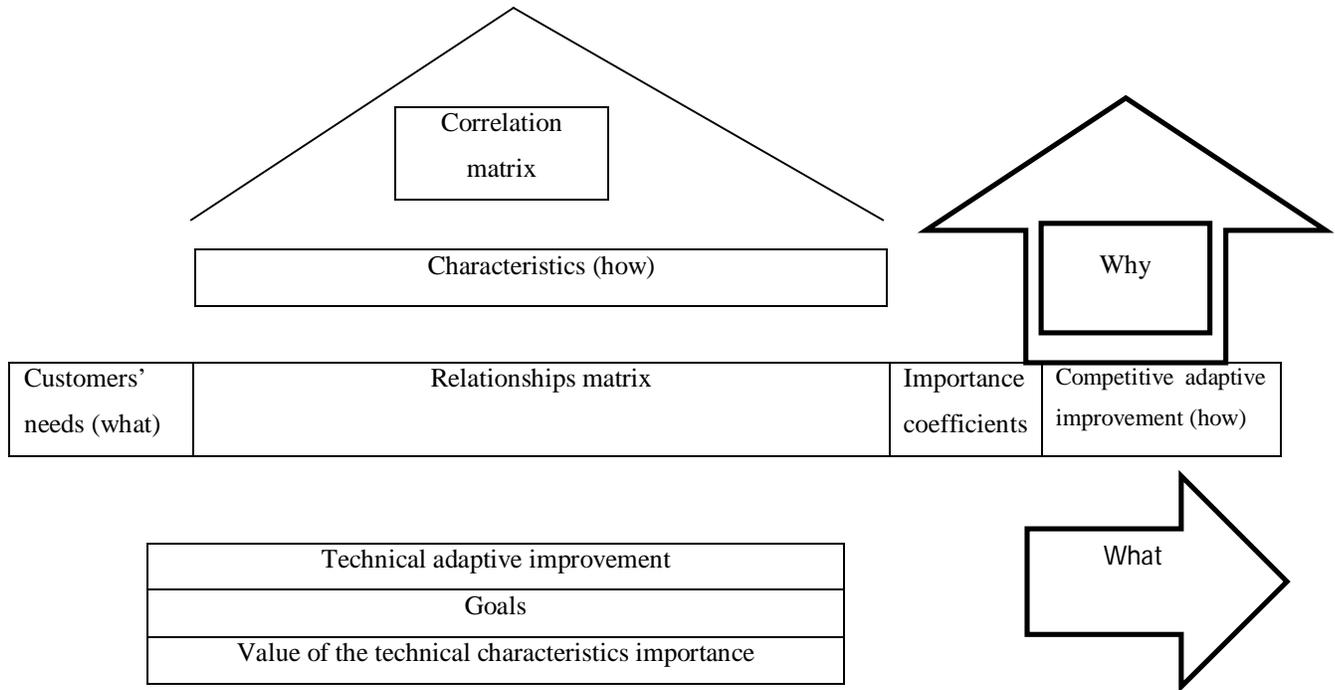


Fig 1: house of quality matrix in the quality function development (Menks et al., 2000)

The customer-oriented approach is a product and service quality designing and improvement method. This is a collective and orderly process that is used for planning and designing new products or improving the existing products regarding the following points:

- The customers’ needs
- The competitive environment information and market needs
- Applying the team working
- Developing the flexible plans
- Transforming the qualitative needs to the measurable goals

This approach is a technique for securing the powerful and unique quality that is designed for following the internal and external customers’ needs and wants and also following them in developing the products and services (Lee et al., 2000).

Analytical hierarchy process

This is a multi-criterions decision making method that a complex conditions offer the best solution by dividing them into smaller sections through constructing decision making tree and considering the comparison matrix and measuring its compatibility (Asgharpor, 2008).

RESEARCH METHODOLOGY

This study is development-practical and also is survey and cross-sectional based on its data collection time period. This study also is quantitative-qualitative from its data entity perspective. In order to evaluate service quality and the customers’ expectation, all of the airport agencies customers in the city of Isfahan are the statistical population. In order to calculate the sample size, Morgan table of sampling was used.

1. A questionnaire with 28 items was used for collecting the research data. This questionnaire was developed for prioritizing the customers’ expectations and loyalty. These questionnaires were distributed among the respondents randomly. Also the paired-comparison matrix was ranked by some of the experts and then was combined by other results and finally its weights were calculated by the Expert Choice software.
2. The key performance measures based on the airport companies strategies and considering its managers and some of the other experts were collected in a questionnaire and then prepared based on the Saati scale. Also

the paired-comparison matrix was scored by some of the experts and also its weights were calculated by Expert Choice software.

3. Quality of work life factors were measured based on the Walton model in a questionnaire with 29 items and were combined with the results of paired-comparison matrix and finally was calculated by Expert Choice software.
4. In the first step, the customers' satisfaction factors were considered as independent variables and the employees' performance measures were considered as dependent variables that were entered to the house of quality matrix and its output is the prioritized performance measures.
5. In the second step, the prioritized performance measures were considered as the independent variables and the quality of work life components were considered as the dependent variables and then entered to the house of quality matrix. The output of this study includes the prioritized effective factors on the customers' satisfaction and loyalty. Also the following model was developed for this purpose.

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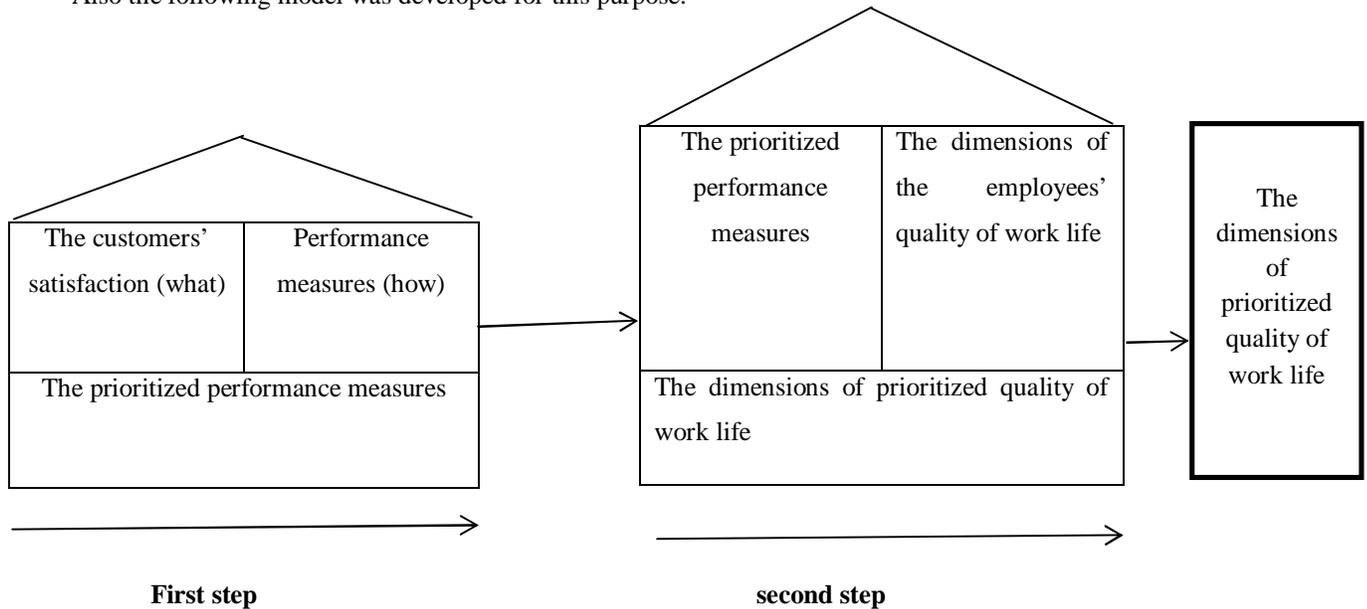


Fig 2: the proposed model

Implementation of the proposed model

In the first step, the input measures that are the quality dimensions from customers' perspective were considered. In order to this, the questionnaire of service quality dimensions that was developed based on the Saati scale was indicated by 30 respondents and then its results were scored. Then, the weight of every measure was calculated through combining the customers' scores and the respondents' viewpoints through paired-comparison matrix. The components were scored through matrix of paired comparisons and then the data were entered to the software after calculating their geometric mean and finalizing matrix of paired comparisons. The measures weights were calculated through Expert Choice software. The results of this step were indicated in the table 1.

Table 1: the weights of the customers' satisfaction measures

Service quality dimensions	Reliability	Accountability	Safety and security	Accessibility	Communications	Customer Recognition	Validity And Reliability	Tangibles	Courtly	Compency	Flexibility	Price
Weight	0.011	0.048	0.042	0.123	0.068	0.072	0.173	0.050	0.053	0.103	0.109	0.148

In the next step, matrix of paired comparisons of 11 factors those were considered as their employees' performance evaluation measures were offered for some of the experts and then a final matrix of paired comparisons were calculated after calculating some variables geometric mean. This matrix was entered to the software and every performance measure's weight was resulted. These weights were entered to the house of quality in the second steps input column coefficients.

Table 2: the weights of key performance measures

Performance Measure	Knowledge And skill	The rational Behavior and the role in group	Learning potentiality And the effect of education	Perception potentiality and dominance on job	Official discipline and legitimation	Consciousness and morality	Honesty and reputation	Responsibility	Confidence	Creativity	Relation with the clients
Weight	0.156	0.016	0.105	0.174	0.106	0.061	0.147	0.042	0.027	0.016	0.150

A questionnaire with 29 items was indicated by the employees for measuring importance of the quality of work factors. Also the matrix of paired comparisons was indicated by experts based on the scores of the Walton model's factors. These weights were entered to the house of quality as the coefficients in the second step.

Table 3: the weights of work life factors

Quality of work life factors	Just payment	Safe and secure workplace	securing growth opportunity and continuous safety	Legitimation in the organization	Social belonging of the work life	Overall life space	Social integration	Human competencies development
Weights	0.017	0.356	0.089	0.047	0.219	0.021	0.021	0.179

In every row of the house of quality matrix, every input measure (what) was measured with every measure of "how" independently. If the relationship is high, its value is 10, value 5 for moderate, value 1 for low relationship, and if there is not any relationship, its table is empty. Then by multiplying the importance coefficients that are resulted from previous table through software and based on the expert's matrix of compared comparisons, their geometric mean was calculated. The results are calculated by the following formula.

$$X_j = \sum_{i=1}^n .Y_i .d_{ij} \quad , j = 1, \dots, m$$

- Yi: importance coefficient of criterions
- dij: the relationship between the criteria and the measure
- Xi: column sum of every criterion

Table 3: house of quality matrix in the first step

Key performance measures	Courtly and reputation	Learning potentiality and the effect of education	Contacting the client	Knowledge and skill	Rational behavior and the role in group	Perception and inferential potentiality and dominance on the job	Job discipline and legitimation	Consciousness and morality	Responsibility and reliability	Creativity
The customers' satisfaction measures										
Reliability			○	○		○	○	□	□	○
Accountability		□	○	○	□	○	□	□	□	○
Security and safety		□	□	□			□		□	
Accessibility		○	●	●	○	●	●	●	●	□
Communications	□	□	○	○	□	○	○	○	○	□
Customer recognition		○	●	●	□	○	○	○	●	□
Validity and reliability	●	○	●	●	○	○	○	○	○	□
Tangibles			□	□			□			
Courtly	○	□	○	○	○	○	○	○	○	
Competency		●	●	●		●	○	○	●	●
Flexibility		●	●	●		○			○	○
Price							□	□		

Direction: 10: high relationship

5: moderate relationship

1: low relationship

As indicated previously, the prioritized performance measures that are resulted from house of quality in the first step are indicated in the table 4 based on their prioritization.

Table 4: the column and normalized scores from the first house of quality with prioritizations

The key performance measures	Rates	Column scores from house of quality	The normalized scores
Contacting the client	1	8.07	0.191
Knowledge and skill	2	8.805	0.185
Responsibility and confidence	3	5.597	0.133
Perception and inferential potentiality and dominance on the job	4	4.68	0.111
Learning potentiality and the effect of education	5	4.013	0.095
Work discipline and legitimation	6	3.616	0.085
Consciousness and morality	7	3.356	0.08
Creativity	8	2.359	0.055
The rational behavior and the role in group	9	1.460	0.034
Honesty and reputation	10	1.318	0.031

In the second step, the performance measures are considered as the input of matrix (what) and its geometric mean from table 4 and also normalized scores in the previous table were considered as importance coefficients of input column. In the following section, the second step of the study was indicated that the Walton quality of work life is prioritized as the “How”.

Table 5: the input coefficients as input column coefficients in the second house of quality

Key performance measures	Geometric score of normal scores and weights from table 4
Contacting the client	0.0675
Knowledge and skill	0.0997
Responsibility and confidence	0.01692
Perception and inferential potentiality and dominance on job	0.01698
Learning potentiality and the effect of education	0.0233
Work discipline and legitimation	0.13898
Consciousness and morality	0.0949
Creativity	0.092
The rational behavior and the role in group	0.0747
Honesty and reputation	0.0296

Table 6: the second house of quality in the second step

Quality of work life factors / The key performance measures	Justice payment	Secure and safe workplace	Securing the growth opportunity and continuous safety	Legitimation in the organization	Social belonging of the work life	Overall work space	Social integration	Human capabilities development
Contacting the client	●	●	●	●	○	●	○	●
Knowledge and skill	○	○	○	□	□	□	□	●
Responsibility and confidence	○	○	●	○	□	○	○	○
Perception and inferential potentiality and dominance on job			□			○		□
Learning potentiality and the effect of education	○	○	○	□		□	□	●
Work discipline and legitimation	○	□	○	○	□	□	□	□
Consciousness and morality	○	□	□	○	□	□	□	○
Creativity			□			□		
The rational behavior and the role in group	□	○	○	○	□	□	□	□
Honesty and reputation					□	○	□	□

Direction: ●: high relationship ○: moderate relationship □: low relationship

Table 6: the results of prioritizing the work life factors

The work life factors from Walton model perspective	Rates	Final column scores of house of quality
Securing the growth opportunity and continuous safety	1	5.327
Human capabilities development	2	5.086
Justly payment	3	5.077
Work life space	4	4.835
Secure and hygiene workplace	5	4.790
Legitimation in the organization	6	4.432
Social integration	7	2.800
Social belonging to the work life	8	2.52

Conclusion

In this study, the two-step quality function development was proposed for prioritizing quality of work life factors based on the performance measures according to the Walton model among employees of the airport agencies. It is necessary to remember that the flexibility of this approach is so much that it is adaptable with other methods of prioritization such as multi-variable decisions making techniques. In this study, 30 respondents were selected based on the Morgan table of sampling and they were asked to indicate the questionnaires with 28 items. The questionnaire that was scored based on the Saati scale seeks to measure importance of the 12 measures of service quality from the customer’s perspective. The final matrix was resulted and entered to the expert choice software after calculating geometric mean and matrix of compared comparisons. The resulted weights indicated that reliability; price, easy and timely accessibility, flexibility in responses, customer recognition, competency, verbal and non-verbal communications, courtesy and respect, tangibles, accountability, and customers’ safety and security in the institute are the most important factors. These factors were entered to the house of quality in the first step in the frame of column input. Then the rows are the managers’ performance evaluation measures in the first matrix. The results of the first matrix indicate that Contacting the client, Knowledge and skill, Responsibility and confidence, Perception and inferential potentiality and dominance on job, Learning potentiality and the effect of education, Work discipline are the most important performance measures. These factors entered to the second matrix and the matrix of compared comparisons was resulted from every measure’s scores important in measuring employees’ performance that were indicated by managers and experts. The normalized scores that are resulted from first geometric mean matrix are the importance coefficients. Quality of work life factors are located in the column of the second matrix based on the Walton model. The results of this matrix indicate that the prioritized factors in the quality of work life include Securing the growth opportunity and continuous safety, Human capabilities development, justly payment, Work life space, Secure and hygiene workplace, Legitimation in the organization, Social integration, and social belonging to the work life respectively. These factors can lead to the employees’ happiness, satisfaction, and also loyalty through influencing their effective performance. The results of this study are applicable for service organizations generally and for airport agencies especially.

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