

## Measurement of Service Quality and its Relationship with the Client's Satisfaction Through SERVQUAL Model in the Gas Company

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**Abstract:** This paper examines the measurement of service quality on the basis of SERVQUAL model in Mashhad Gas Company and its relationship with the clients satisfaction. The group under study is all the clients of Mashhad Gas Company that use the gas services of these three regions. All stages of assessment of sample volume, has been done by statistical PASS software, version 2004. With respect to the goals of research and initial data concerning the research group, it shows that the correlation coefficient between service quality and satisfaction of clients is 27/2 percent, with ninety five percent assurance, at least 141 people as the sample volume was estimated. After collecting the information, they were processed and after that the research assumptions were tested and by statistical methods and using the SPSS software, version 11/5 were analyzed. By using the gathered information, the assumptions under study were tested. The test results of the main assumption and related assumptions to it, shows that at the level of certainty 95 percent between service quality and the satisfaction of clients, there is a positive and significant relationship and also at the certainty level of 95 percent, there is a significant relationship between the constituent factors of SERVQUAL.

**Key words:** Client's satisfaction % SERVQUAL % Responsiveness % Assurance % Empathy

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### INTRODUCTION

Today, the most important challenge with which public sector authorities always face is to respond to changing demands and expectations of the citizens from whom the public sector obtains its legitimacy. To respond to those demands, public management should seek modern methods to provide the citizens with innovations in supplying public services. Today, citizens expect governmental systems to make measures in saving client's time so that they may have a better access to information and their changing demands are met [1]. Moreover, evaluation method of concepts such as customer's satisfaction or his impression of services, whether from the viewpoint of necessity in quality management systems or appropriate feedback from the performance of the organization, has attracted the attention of most Iranian companies within the recent years. In recent years, government has made efforts to increase the quality of services and to satisfy customers in public sector by making fundamental measures such as honoring plan but

it has not achieved any considerable success due to lack of any scientific and applied pattern in this regard. In this study, efforts will be made to provide a scientific and applied pattern to investigate the impressions of gas company customers based on service quality scale model and to make necessary suggestions.

Addressing customer orientation and satisfaction of service recipients is considered as one of the main orientations in modern management theories. In the administrative system of our country, people's satisfaction with the services of public systems is also considered as one the standards for evaluation of efficiency and growth and development of the system. Moreover, it increases general trust which is the greatest capital and support of administrative system. Besides, the importance of customer and his satisfaction is something that goes back to global competition [2]. As we see in Malcolm Baldrige National Quality Award, about 30% of total scores is determined based on customer satisfaction [3]. On the other hand, although Iranian organizations such as Gas Company are monopolistic and service

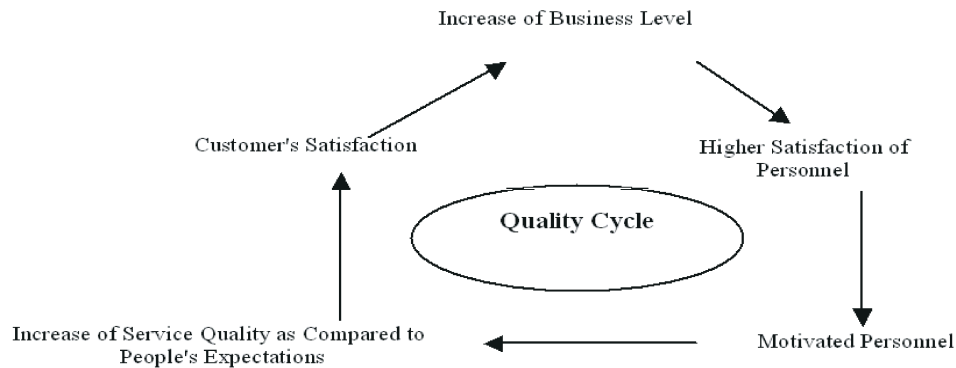


Fig. 1: Advantages of Service Quality

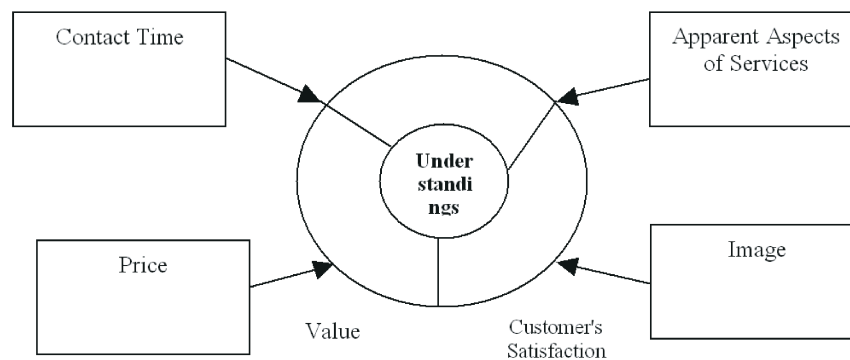


Fig. 2: Effective Factors of Customer's Impression of Service

quality has not any considerable effect on the number of people who refer to that organization, it is necessary to deal with this issue due the following reasons:

- C Competitors' Activities: Considering the speed of privatization in Iran, it is expected that such companies may not continue to be monopolistic in the future though at the present time this does not apply to the gas company whose activities are in a monopolistic environment.
- C Environmental factors: Government seeks to satisfy the client and this has been fulfilled through different plans such as client honoring plan.
- C Increase of customer's expectations: Clients' expectations have increased compared to the past. This may be due to increase of their level of knowledge, organization's advertisements and performance of competitors.
- C Nature of services: Clients evaluate the quality of services by addressing physical evidences of services and behavior of personnel.
- C Lack of any similar research in the statistical society under study: No scientific study has been made on the quality of services especially in gas section.

- C Appropriate planning: This study identifies the advantages and disadvantages of Mashhad Gas Company in relation to the quality of its services. This information is necessary for appropriate planning in the organization.

**Literature Review:** Addressing the quality of services is quite effective in differentiating the organizations and providing a competitive advantage [4]. Heskett has shown the quality of services in the following diagram [5].

In addition to these advantages, it has been proved through several studies that supplying high quality services will lead to customers' satisfaction, intentions for repurchasing (loyalty) and positive verbal communications [6]. Therefore, public organizations need to identify the impressions and approaches of their clients in order to satisfy them. It is important to gain some information about the clients' impressions in order to understand what is worthy to them [7]. Figure 2 shows some of the effective factors of customers' understandings of services[8].

This figure shows that four factors affect customer's understandings about service quality and value. These factors include: 1) Mental filters: Beliefs and

values, knowledge, memory, etc. that affect customer's feelings and understandings. Approaches and behaviors of first people in the organizations (suppliers of services having direct contact with clients) in contact with clients are important factors in the impressions of clients about the services [9], 2) Physical filters or apparent aspects of service: Apparent aspects of service are classified into three groups: People, procedures and physical aspects. These three groups cause the service to appear objectively [10], 3) Image: The image customers have in their minds about a company may also influence on customer's impression of service, 4) Price: By paying for a specific service, the customer compares its quality as compared to the paid amount from the time of receiving the service up to the stages after its receipt [8].

**The Relation of Quality and Satisfaction:** About 1447 articles have been published on the quality of service from 1992 to 1994. This indicates the high importance of quality in the present world. Furthermore, concepts such as *Service Quality* and *Satisfaction with Service* used in the articles and marketing activities have been highly addressed within the past decades and were considered as standards of competitive advantage of an organization though the exact nature of customer's judgments and the relation between service quality and customer's satisfaction is not clear yet [11].

Measuring customer satisfaction has become an important element of competitive benchmarking, a business objective and also standard for performances measurement [12]. Furthermore, there is a relative consensus among the marketer researchers to the effect that service quality and customer's satisfaction are individual structures [13]. There are three viewpoints in this regard. Some believe that it is the satisfaction that leads to service quality. The second approach in this regard is about the researchers who believe service quality leads to satisfaction. The third viewpoint tends to necessity approach. It means that neither of the two concepts are preferred to the other and that the casual relation between these two concepts is determined by considering factors such as physical environment, groundwork for supplying services, etc. The results of researches show that although there is no consensus about casual order of these two concepts among the researches, most researches made in this regard support the priority of service quality over customer's satisfaction. In fact, most researches have shown that it is the service quality that results in satisfaction [14].

**Research Model:** Many researchers such as Armistead, Gronroos, Walker, Johnstone and Lethinen have provided lists of service quality aspects. For example, Gronroos believes that quality consists of three parts, 1) technical quality of outputs, 2) Functional quality of services, 3) common image. Lethinen states that a distinction should be made between the quality caused by process and the quality caused by outputs to specify the determinant factors of quality service. This separation is useful for investigating and reviewing the reasons of service quality level [15]. Of course, Riadh Ladhari has identified in his research the shortcomings of each of the tools used for measuring service quality. He has mentioned that such shortcomings does not invalidate the usefulness of fundamental standards and provides appropriate recommendations for growth and development of future standards [16]. More detailed classifications of quality determinant factors have been provided in the studies made by other researchers out of which Parasuraman Model may be referred to [17].

**Service Quality Measure Model:** One of the models mostly used for measuring service quality is the Service quality measure model which was developed in 1985. Founders of this model, i.e. Parasuraman, Zeithaml and Berry had a considerable contribution in the growth and development of that model by publishing articles and studies. Parasuraman suggests service quality aspects by presenting elements such as communications, responding, trust, authentication, competency, access, politeness, security, clients' understandings and physical aspects. After the studies made through this model in service industries such as university, bank, credit cards, repair and maintenance and communications, these aspects were summarized in 5 basic models including physical appearances, reliability, responsibility, assurance and empathy [18, 19]. The average of these elements is considered as service quality. Service quality measure model is the first tool for quality evaluation in service marketing. It is extensively used by managers and researchers to evaluate customer's understanding of service quality [18]. Since its publication in managerial and marketing articles, it has proved its popularity among researchers and practitioners [20]. This model has some characteristics which may be applicable with the least modifications for a broad range of service environments as well as services of public sector [21]. Coskun Bakar and etal show the applicability of Service quality measure in their research titled "Measuring Functional Quality in the Evaluated Hospitals" [22]. The structure hidden in the

Table 1: The difference between customer's satisfaction and service quality

Service Service Quality	Customer's Satisfaction
Fundamental aspects related to service quality judgments are somehow specific.	Customer's satisfaction may arise from any aspect, whether or not related to quality.
Expectations on service quality are ideal based on comparison with ideals or understandings.	Customer's satisfaction judgments may be caused by a number of non-quality issues regarding the product or service such as demands, equality, understanding about justice, etc.
Service quality has a lower conceptual background.	It is believed that customer's satisfaction may have more conceptual backgrounds.
Understanding service quality does not need experiencing services or interacting with service supplier.	Satisfaction judgments require experiencing services or interacting with service supplier.

Table 2: Definition of the five aspects of service quality

Five aspects	Definitions of aspects
Physical aspects and appearances	Office equipment is modern. The appearance of physical equipment and facilities is appropriate. The environment of service organization is clean. Personnel are well-dressed.
Reliability	Prompt supply of services to customer. Eagerness of personnel to supply services to customer and to assist him. Personnel have sufficient time for the clients. To give promises to customers for the time of services.
Responsibility	Performing the services promised to the customers. Interest in solving customer's problems. Correct supply of services in the first referral of the customer. Correct supply of services in the promised time.
Assurance	Personnel are reliable. Clients are satisfied with personnel behavior. Personnel of the organization are polite. Personnel enjoy necessary technical knowledge and capability to perform the services.
Empathy	Each customer is specifically addressed. Personnel like customers. Personnel understand customers' demands. Service hours are suitable for customers.

foundation of the tool of this model is quite suitable for summarizing service quality in public sector. Service quality measures have 22 standardized components used to measure the expectations and understandings of clients about important aspects of quality. This measure includes five basic aspects as follows: The definitions of the above 5 aspects are presented in Table 2 [23].

**Research Method:** PASS (Power And Sample Size) statistical software, version 2004, was used to estimate sample volume. Considering the research goals and initial sample information concerning the condition of research society and considering the fact that correlation coefficient between quality service and clients' satisfaction is 0.272, the minimum sample volume was estimated at 141 people with 95% confidence. Considering the fact that research society includes all the clients of Gas Company in the 3 regions of Mashhad in 2008, the best sampling method is random class-based sampling

plan in which each of the three regions of Mashhad Gas Company consisted of one class of the society. Since the costs for sampling and distribution of concerned variables in the three regions are considered almost the same, 50 people from each class of the society were selected as sample and were investigated using equal allocation method.

**Independent variable:** Independent variable in this study is the quality services measured based on 5 aspects including physical dimensions and appearance, reliability, responsibility, assurance and empathy. These constituents were first measured and then their average was considered as the quality of services.

**Dependent variable:** Level of customers' satisfaction form our dependent variable that has been measured with a 5-degree range. Satisfaction is the full response of consumer (for consuming goods and services). Satisfaction is a judgment about the service or good or its quality that has caused a complete level of pleasure which

may be lower or higher than a complete level. Customers' satisfaction questionnaire consists of 22 questions. It should be noted that the average of the 22 questions is considered as the average satisfaction level.

This research is of an applied type and its method is based on a descriptive-field method. Spatial domain of the project includes regions 1, 2 and 3 of Mashhad Gas Company. The subject of this research is to study about the quality of services in the said company and to measure its relation with the clients' satisfaction. The case study includes the customers who referred to each of the said 3 regions of Gas Company in August 2008.

**Research Hypotheses:** The main hypothesis: There is a significant relation between the quality of services (based on service quality measure model) in Mashhad Gas Company and clients' satisfaction.

**Subsidiary Hypotheses:** There is a positive and significant relation between physical appearances and dimensions and satisfaction level of Gas Company Clients.

- C There is a positive and significant relation between reliability and satisfaction level of Gas Company Clients.
- C There is a positive and significant relation between responsibility and satisfaction level of Gas Company Clients.
- C There is a positive and significant relation between assurance and satisfaction level of Gas Company Clients.
- C There is a positive and significant relation between empathy and satisfaction level of Gas Company Clients.
- C There is a significant relation between the priorities of any of the service quality aspects.

A questionnaire was used to collect the necessary data. Although the questionnaire was standard, it was tested by validity test and its validity and reliability were calculated and confirmed. Service quality measure model questionnaire was a standard questionnaire and the results of the researches confirmed that the five aspects were clear and definite [24]. A preliminary test with 21 people as sample was made to determine validity level of the questionnaire. The results of the test were analyzed and showed that the questionnaire had a high validity and reliability. Reliability coefficients of service quality and

clients' satisfaction questionnaires were  $\alpha = 9377\%$  and  $\alpha = 8945\%$ , respectively. On the whole, validity level of the questionnaires was calculated and showed a level of  $9161\%$  ( $\alpha = 9161\%$ ) indicating high validity of the questionnaires.

**Data Analysis Method:** Data is processed after collection and is then analyzed by using SPSS software, version 11/5. (a) At first, observations were described by descriptive statistical methods including frequency and empathy tables, histogram diagrams and central tendency and distribution indexes. (b) Then they were analyzed inferentially using inferential statistical methods such as Pearson correlation coefficient significant test, repeated measures test analysis, multiple linear regression model, one way analysis of variance, etc. Furthermore, infrastructural measures related to parametrical tests were investigated and no problem was found (such as errors variance constant in regression analysis, one way variance analysis, normal condition of dependent variable distribution in regression, variance analysis in student test, independency of errors in variance and regression analyses).

Average service quality is shown in table 3 by considering the 5 aspects of service quality.

On the average, about 7 people out of the 150 people under study did not specify their responses about service quality. Average service quality among the respondents based on its aspects was 3.076 to 6.108, i.e. an average to high level. Most respondents evaluated service quality to be appropriate.

**Average Satisfaction Level of Gas Company Clients:** Almost all people under study specified their responses about the clients' satisfaction.

Average level of clients' satisfaction among the respondents was 3.107 to 4.177, i.e. an average to high level. Most respondents evaluated their satisfaction at 3.065 which shows a high satisfaction.

#### Inferential Analyses

**First Hypothesis Test:** Pierson linear correlation coefficient significance test with an error level of 5% shows that there is a positive and significant relation with a coefficient of 43.7% between physical appearances and aspects and clients' satisfaction ( $P \neq 0.001$ ). In other words, clients in public sector wish physical facilities, equipment, organizational environment and personnel appearances to be good and appropriate. The better such aspects are, the higher will be the clients' satisfaction.

Table 2: Characteristics and specifications of statistical sample

Demographic Characteristics					
Description		Number (absolute frequency)	Relative frequency percentage	Relative valid frequency percentage	Relative cumulative frequency percentage
Gender	Man	120	80	8/81	8/81
	Woman	28	7/18	9/18	100
Age	Under 20	7	7/4	7/4	7/4
	21-30	59	3/39	6/39	3/44
	31-40	44	3/29	5/29	8/73
Education	Before high school	52	7/34	7/34	7/34
	High school diploma	59	3/39	3/39	74
	Associate degree	18	12	12	86
	Bachelor's degree	16	7/10	7/10	7/96
	Postgraduate	5	3/3	3/3	100

Table 3: Statistical indexes of service quality

Number	Unreported	Average	Mode	Standard deviation
143	7	092/5	6	02/1

Table 2: Statistical indexes for customer's satisfaction

Reported Number	Unreported Number	Average	Mode	Standard deviation
150	0	643/3	65/3	535/0

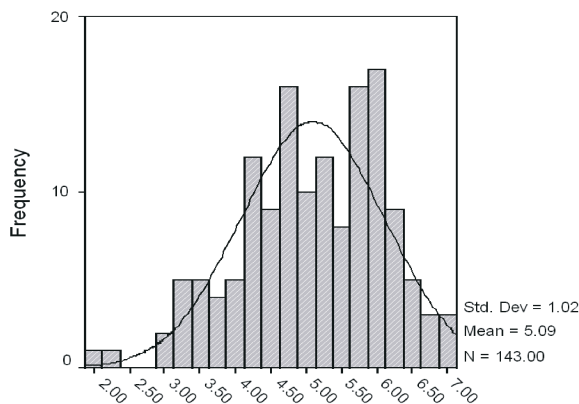


Diagram 1: Frequency distribution of people's empathy with the quality of services

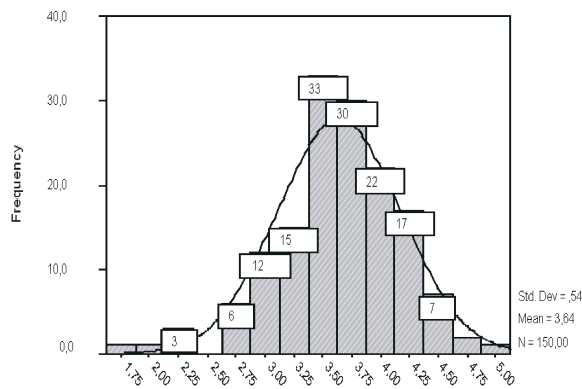


Diagram 2: Frequency distribution of clients' satisfaction level

**Second Hypothesis Test:** Pearson linear correlation coefficient significance test with an error level of 5% shows that there is a positive and significant relation with a coefficient of 54.1% between reliability aspect and clients' satisfaction ( $P \leq 0.001$ ). Public sector clients expect to receive prompt services, to receive the services exactly on the time promised to them and to receive services with a kind and appropriate behavior. The higher the quality of such aspects is, the higher will be the clients' satisfaction.

**Third Hypothesis Test:** Pearson linear correlation coefficient significance test with an error level of 5% shows that there is a positive and significant relation with a coefficient of 57.5% between responsibility and client's satisfaction ( $P \leq 0.001$ ). In other words, public sector clients wish to receive the promised services, to be served with accurate services and to be welcomed for solving their problems. The higher the quality of such aspects is, the higher will be the clients' satisfaction.

**Fourth Hypothesis Test:** Pearson linear correlation coefficient significance test with an error level of 5% shows that there is a positive and significant relation with a coefficient of 61.5% between assurance and clients' satisfaction ( $P \leq 0.001$ ). In other words, public sector clients wish the personnel of organizations to have sufficient skill and necessary expertise, to behave politely and respectfully with clients and to pay attention the clients friendly. The better these aspects are, the higher will be the clients' satisfaction.

**Fifth Hypothesis Test:** Pierson linear correlation coefficient significance test with an error level of 5% shows that there is a positive and significant relation with a coefficient of 62.7% between empathy and clients' satisfaction level ( $P \leq 0.001$ ). In other words, public sector clients wish public organizations' personnel to make effort to understand the clients and their needs and demands.

**Sixth Hypothesis Test:** Repeated measures plan analysis and Bonferroni multiple comparison test were used to compare the respondents' answers about prioritization of the five factors of service quality. Pairs of significantly different averages are indicated by asterisks in Table 7. They indicate, with an error level of 5%, that the priority specified by respondents about the five aspects of service quality is significantly different. This means that according to customers: (1) Reliability, responsibility and assurance are in the first priority and the better such aspects are, the higher will be the quality of services from their viewpoints, (2) empathy aspect is in the second priority, (3) physical appearances and aspects are in the third priority.

**Main Hypothesis Test:** Pierson linear correlation coefficient significance test with an error level of 5% shows that there is a positive and significant relation with a coefficient of 64.7% between the quality of services and clients' satisfaction ( $P \leq 0.001$ ).

In other words, clients' satisfaction will increase upon the increase of service quality based on the said five aspects. The quality of services affects clients' satisfaction.

Other findings of the research showed that age, gender and education have not any significant effect on people's evaluation of service quality and their satisfaction. But service receipt was effective on the level of satisfaction and people's evaluation of service quality. Moreover, multiple regression analysis using Pesro method was used to investigate the effect of each of the service aspects on the clients' satisfaction. After four repetitions, the analysis showed with a 5% error level that assurance and empathy aspects had a significant effect on the clients' satisfaction. The linear relation coefficient between clients' satisfaction and each of assurance and empathy aspects is 42.8%.

**Conclusion and Recommendations:** Of the different and effective aspects of organizations, the present research sought to understand, to investigate and to evaluate clients and service recipients' satisfaction with different aspects of service quality. To achieve this understanding, 5 aspects of service quality measure model were concentrated out of the current different aspects of services in the organizations. These aspects included physical indications, reliability, assurance, responsibility and empathy which were less addressed in some of the similar available researches. Since there is a positive and significant relation with a coefficient of 64.7% between service quality and clients' satisfaction and the clients' satisfaction will increase upon the increase of service quality based on the said 5 aspects, in parallel with quality improvement based on its five aspects, it is recommended hat:

Table 5: Calculation of their correlation and significance

	Correlation coefficient	p-value	5/ p < 0	Relation result
First hypothesis: The relation between physical appearances and aspects and clients' satisfaction	7/43	000/0	7/43>0/000	Positive
Second hypothesis: The relation between reliability and clients' satisfaction	1/54	000/0	1/54>0/000	Positive
Third hypothesis: The relation between responsibility and clients' satisfaction	5/57	000/0	5/57>0/000	Positive
Fourth hypothesis: The relation between assurance and clients' satisfaction	5/61	002/0	5/61>0/002	Positive
Fifth hypothesis: The relation between empathy and clients' satisfaction	7/62	000/0	7/62>00/0	Positive

Table 6: Statistical indexes for the priority of each of the five aspects

Priority	Average	Standard deviation	No. of respondents
Physical appearances and aspects	47/15	695/7	131
Reliability	52/23	129/8	131
Responsibility	87/21	580/6	131
Assurance	86/21	065/8	131
Empathy	31/19	363/7	131

Table 7: Bonferroni multiple comparison between different service quality aspects

First group I	Second Group J	Average difference (I-J)	Standard deviation	Significance level	Confidence interval 95	
					Low level	High level
Physical appurtenances and aspects	Reliability	-7,779 *	,805	0/000	-5,479	-10,078
	Responsibility	-6,130 *	,740	0/000	-4,018	-8,242
	Assurance	-6,122 *	,716	0/000	-4,077	-8,168
	Empathy	-3,573 *	,736	0/000	-1,470	-,675
Reliability	Physical appurtenances and aspects	7,779 *	,805	0/000	10,078	5,479
	Responsibility	1,649	,779	,362	3,873	-,576
	Assurance	1,656	,843	,515	4,064	-,751
	Empathy	4,206 *	,895	0/000	6,761	1,652
Responsibility	Physical appurtenances and aspects	6,130 *	,740	0/000	8,242	4,018
	Reliability	-1,649	,779	,362	,576	-3,873
	Assurance	,008	,695	,515	1,993	-1,977
	Empathy	2,557 *	,764	0/000	4,738	,376 4
Assurance	Physical appurtenances and aspects	6,122 *	,716	0/000	8,168	4,077
	Reliability	-1,656	,843	,515	,751	-4,064
	Responsibility	-,008	,695	1/000	1,977	-1,993
	Empathy	2,550 *	1,00		4,785	,314
Empathy	Physical appurtenances and aspects	3,573 *	,736	0/000	5,675	1,470
	Reliability	-4,206 *	,895	0/000	-1,652	-6,761
	Responsibility	-2,557 *	,764	0/011	-,376	-,738
	Empathy	-2,550 *	,783	0/014	-,314	-4,78

Table 7: Calculation of their correlation and significance

Description	Satisfaction	Service quality
Satisfaction	Correlation coefficient	1
	Significance	0
	Number	150
Service quality	Correlation coefficient	7/64
	Significance level	0
	Number	143

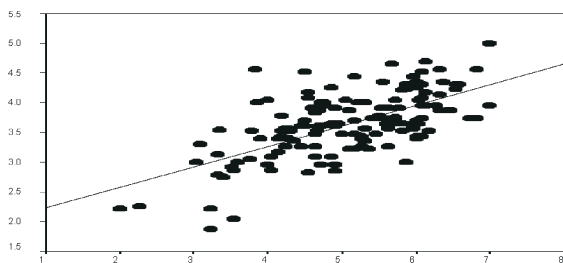


Diagram 3: Dispersion of service quality and clients' satisfaction

Those personnel who are in contact with the clients shall use clean uniforms (uniform plan). Since the most important organizational rank in the service sector that can affect on service quality and customer's satisfaction is the low rank of the organization that includes sections such as guarding, disciplinary, admission information, accounting and employees of clients' services section and since the personnel of these ranks often lack necessary sociability skills to contact with the clients and customers,

we face a broad dissatisfaction of clients in service organizations. In this direction, the behaviors and actions of low rank personnel of organizations may be corrected through establishing long term trainings, informing low rank personnel of organizations in service sections about the importance of their services, use of methods such as involvement of performance results in job promotion, presentation of exemplary employee, awarding medals of merit in case of clients' satisfaction, etc. One of the social characteristics of our administrative system is the axial nature of personal referrals that cause people's dissatisfaction and increases the costs. Therefore, more efficient use of information technology shall be emphasized. Moreover, the qualities of postal services and electronic communication of organizations with people shall be desirable.

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