

Investigation on Effectiveness of Suggestion System Settlement in Yazd Gas Company and Method Offered for Developing Improvement

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Abstract: In this research, the effectiveness of suggestion system in Gas Company located in Yazd province has been evaluated. The applied statistical methods in analysis the data, the descriptive statistic and deduction statistic were used, applying SPSS software. Analyzing the evaluation of effectiveness has been done in form of both pair and independent comparisons, and through this, components which had the most and least effectiveness from this system, and also components were extracted which had the most and least difference more than expected effectiveness from suggestion system, according to the responders' viewpoint, and solutions have been suggested in order to improve its effectiveness. In this research, Innovation is included of design questions to investigate the effectiveness with two present situations and ideal situation in order to the possible above mentioned effectiveness analysis, finally a relation has been extracted and presented in order to measure the effectiveness of questionnaire structure.

Key words: suggestion system, effectiveness, productivity, innovation, job satisfaction.

INTRODUCTION

It is essential to encourage all human beings with any ages, knowledge and cultures and any occupational class and organizational position, to think, and to value and appreciate their thoughts. Any one needs to think and feels satisfy when thinking and solving a problem. These are the profound needs of any one and the response to these needs causes the mental health of individuals, so it will be useful for interests of any organization to establish a system which could response to these needs.

Participative management system is one of the dynamic management systems which play an important role in developing human resources of organizations. Participative management is to create a space and system in a way that all employees, clients and contractors of an organization have cooperation in process of making decisions and solving the problems of the organization. The main emphasis of this kind of management is on voluntarily cooperation and participation of employees, clients and contractors, and wishes to use their ideas, suggestions, innovations, creativities and technical power in order to solve the organization problems to constant improve of the organization activities.(Sheikh Mohamadi *et al.*, 2005)

Suggestion system is one of the useful executional instruments of participative management which gives a chance to individuals related to execution organization including employees, clients, suppliers, and even employees families to present their suggestions individually or in a group in order to improve the condition of the organization, and in front of the gained profit, receive proportional reward. In other words, suggestion system prepares a mechanism which by means of it we can access the mental findings of human capitals and their potential abilities for constant bodification of the organization and we can prepare the way for papering the creativeness and actualizing the inner talents of employees.(Owlia and Amin, 2000).

What is discussed as ideal goals and in fact as philosophy of its usage is increase in the company power in front of changeable desires of service or products consumers of that institution through valuing the excellences and abilities of human and accompany clients goal with goals of the company and finally, proper usage of their experiment, thought, opinions and ideas in any occupational class and any organizational section.

Literature Review: Among the researches done in the field of participative system, it is Kurt Loin's researches that show when people join directing the works, their resistance in front of changing and renovation and innovation decreases and they become compatible.

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Other researches show that participation in directing the works improves the employee's morale; decreases the range of required supervision and control; increases the employees' patience toward each other; creates more compassion toward work and helps to make pleasant organizational space. Psychological investigations show that when people get chance to express their thoughts and participate the decision which effects their destiny, they will be more innovative and creative and become more responsible.

Nowadays, the participative system as an individual advisor in Japan industry has been progressed to the extent that capitation of employees' suggestion is counted as one of the parameters of measuring the degree of companies' success. This remarkable success that is the result of the right combination of American suggestion system with the Japanese culture, caused the public know the Japanese as the pioneers of planning the suggestion system.

Execution of suggestion system was inclusively started in Iran from 1987 following the visit of a group of experts of renovation expansion of Iran industry from Japan with the support and backing of Industry Ministry. Thus, suggestion system was tentatively executed in four companies including, Iran radiator manufacturing company, Navard and steel parts production, Soliran and Akam Metal. (Owlia, MS., Amin, M., 2000)

Many governmental organizations in recent years took measures in execution of suggestion system. In relation to this, the high administrative council in September 1998, within an approval, have emphasized the establishment of "system of acceptance and considering of suggestions" in all ministries, institutes, companies and governmental banks. (Mehri, K., 2001)

Following the implementation of participative system in organizations, several researches have been done about effectiveness of suggestion system in some companies that some of them are mentioned in the following. In a research that have been done in Iran meter manufacturing company with the title of "the effect of participative management on efficiency of production in Iran meter manufacturing company", we obtained significant relation between participative management, quantity of production, quality of production and production expenses of this company. The results of this research show that there is a direct relation between participative management and production quantity and quality and a reversed relation with production expenses. (Ramezani, J., 2004)

Another research which has done in Electric Communication company of Qom province, with the title of "investigation of effective factors in participation the employees in suggestion system and representation of suitable pattern considering the participative management system", shows that there is a significant relation between factors of education, age, work history, salary and extra pays and organizational position of employees and the researcher has represented suitable strategies and patterns for more participation of employees. (Habibnia, R., 2003)

In another research, the researcher has investigated the degree of effect of participation the employees in management decision making and the results show that the implementation of investigation system and acceptance of suggestions in general office of Physical Education in Western Azarbayejan causes improvement of decision making and also causes the increase of satisfaction and trust and decrease of their resistance. (Mehri, K., 2001)

In modern world that human resource is considers as axis of change, development and progress of a company and creativity, thinking, future prediction, undertaking and interesting to the advancement only can be meaningful in human nature, the managers should be able to effort for advancement of these factors.

Using optimized managers' sources mainly is among the human valuable and critical sources and personnel, professional and expert workers specially lead to know and apply the modern methods of organizations management, considering the environmental and required situations.

In this article it is attempted to measure the effectiveness of suggestion system in Gas Company of Yazd province by designing every aspect questionnaire and strenght and weakness points of this system were extracted from responders' viewpoint, also some solutions are suggested to improve the weakness and maintain the strenght.

Definitions: Concepts of effectiveness and suggestion system: effectiveness is known as degree and rate of achievement to determined aims. Proportion rate with the aim, rate of providing determined goals via a thing, person, product or program or rate of responding to their needs from which they are affected, In other word, the effectiveness is known as the performed correct tasks. (Ramezani, J., 2004)

Suggestion system is as an executive instrument of participative management. In this system, all of the organization personnel actively think about the ways and problem solution and promoting the usage and they represent the results as a plan and suggestion to the organization.

Suggestion system is a combination of two words, system, meaning a set of connected parts that have mutual effect and attempt for a common aim and the concept suggestion that is any thought and new idea that could result in making a positive change, improvement of the method, increase of quality, decrease of expenses and promoting the morale of employees.

Using personnel thought for recognition of the problems and solving them for participate personnel in all levels, thus the suggestion system is a technique which they can be participated in management.

This instrument is known as esteem to human values and to call assistance of individuals in order to achieve the determined and common aims. If cooperation programs are selected properly, considering the conditions dominated on the organization, it will be involved of positive results in improving the conditions. (Sheikh Mohamadi, M.,Tolit zavare,M.,2005)

Designing a problem: Gas Company of Yazd province is one of the province Gas Companies which is subset of National Iranian Gas Company that was established in end of 1998 with the aim of latticework and installing the gas branches to distribute clear energy for house, commercial and industrial consumption.

Structural orientation of this company is toward using modern technology in the current actions and commonly it follows from structure set of Iran national gas company. Now, this company has 400 formal and contractual personnel. Since 1379, suggestion system was established in Gas company of Yazd province with the aim of providing the necessary condition to perform management advanced systems via accepting note system, common participation of the personnel in planning, creating suggestion investigation systems, to approve and performing the suggestions in direction of system goals, improving and promoting quality in the systems, methods and regulations, progression of human resources, to improve using the creativities.

Considering this matter that every system needs evaluation after its installing, the present research has been done with the aim of evaluating the effectiveness of the performed suggestion system in Gas Company of Yazd province and providing some solutions to improve it.

The obtained results from this investigation can be applicable in Gas Company of Yazd province and also in other similar centers.

Method of Research: Since the present project is classified in descriptive- measurement researches, thus in this study, method of research is in type of measurement which follows from field studies branch.

Method of data collection is as field and library method. Instruments of questionnaire have been used in order to data collection. During the present research, in addition to use the similar researches the questionnaire was observed by members of participation system in Yazd province Gas Company and also same university professors and was used by them to improve it in order to measure validity.

To determine the questionnaire reliability, the Cronbach's α coefficient has been used [9] and its value has been obtained equal to 0.975 in this study.

In this study, the under studying statistical society are including of personnel in gas company of Yazd province with bachelor and higher educational degree and managers of this company.

To analyze and conclude from collected data, the SPSS software was used.

Research materialsL: After library study, the same results of researches, articles, thesis, interviewing with authorities and experts of participation councils in gas company and opinions of university professors and connoisseurs in this field have been used to design the questionnaire in order to measure the effectiveness of suggestion system and after investigating the aims of suggestion system in various books and references, the effective factors in determining effectiveness of suggestion system has been extracted as the following: (Brian.T.Georgy,Stanley.G.Harris.,2009, Cascio, W.F.,2005)

- 1- productivity criterion with the sub-criteria : (Miller K.I & Monge P. R., 1986)
 - 1-1- productivity of human resource
 - 1-2- Reduction of waste
 - 1-3- Optimized use of financial sources and equipments
- 2- Job satisfaction criterion with sub-criteria : (Shagholi,R., Sufean, H.,2009, Wagner, A.J. 1994)
 - 2-1- personnel motivation
 - 2-2- To increase undertaking and loyalty of the personnel. (Yousef, D. A. 2000)
 - 2-3- revival of self -believe and self-confidence of personnel
- 3- Creativeness criterion with sub-criteria: (Shagholi,R., Sufean, H.,2009, Owlia, MS.,Amin, M.,2000)
 - 3-1- developing and progression of the organization
 - 3-2- to encourage for think

- 3-3- to increase creativeness and innovation
- 4- quality improvement criterion with sub-criteria : (Brumand, N.2004)
- 4-1- quality improvement of the performed works in the organization
- 4-2- solution of organization current problems and decision making about it (Scott,L.B,2004)
- 4-3- reduction of the possible errors in decision making and performing the tasks (VanYperen, Nico W., Agnes E. van den Berg & Martijn C. Willering.,1999)

And Other Criteria:

- 5- Promoting organizational culture
- 6- to support cooperation
- 7- to increase the personnel information
- 8- to facilitate performing changes
- 9- to decrease official bureaucracy
- 10- to increase tendency of team working (Barak, M., T. Maymon and G. Harel.,1999)
- 11- to respect the personnel personality and providing need for admiring
- 12- to increase the morale of participation (Teicher, J. 1992)
- 13- Same direction of person and organization aims
- 14-to increase responsibility sense

General form of research questions is like this that according to your idea, how much the establishment of suggestion system on the following criteria A:was effective B:can be effective And answers of the questions has been considered with systematic scale in five fold classification of Likret's spectrum by classification of : very little, little, average , much and very much and scoring 0,1,2,3,4.

In order to measure the effectiveness, the questions were designed as form of A and d the questions those which were designed as B are because of the following reasons:

- Importance of all questions should not be considered similar and hereby relative weight of each factor can be determined.
 - Statistical analysis of effectiveness questionnaire should be performable in both forms of couple and independent comparisons.
 - The difference between what can be existed and what is present should be measurable and finally the factors with much difference of both manners should be recognized.
 - In second section of questionnaire, the effective factors on the effective performing the suggestion system have been propounded in form of following 12 questions: (Khanifar *et al.*, 2008)
- 1- Rate of notification about task procedure of suggestion system,
 - 2- Obviousness of aims of suggestion system for the personnel,
 - 3- The performed propagandas about introducing the suggestion system,
 - 4-training about suggestion system,
 - 5-proper performance of suggestion system secretariats,
 - 6-time of paying the gift and reward belonged to suggestion,
 - 7-amount of gift and reward belonged to suggestion,
 - 8-personnel belief toward suggestion system,
 - 9-managers' belief toward suggestion system,
 - 10- Resistance of company managers in performing the suggestions,
 - 11-Managers' tendency toward team work and participation in decisions,
 - 12-Percentage of personnel encouragement by related authorities to give the suggestion

It is notable that in this questionnaire, gender variables and work history with work history less than 10 years, between 10 to 20 years and more in order of group have been propounded as independent variables.

Descriptive Analysis:

In order to obtain the effectiveness from establishment of suggestion system numerically, the parameters a_i , b_i and c_i have been defined as the following:

If a_i is named as average of section A scores of i^{th} questions from all questionnaires and c_i is named as average of section B sectors of i^{th} question and $c_i/4$ is named b_i , so b_i can be considered as relative weight of each questions. Dividing c_i by 4, because using Likrets' spectrum from 0 to 4 score, the relative weight of

each factors (bi) is obtained as a number in zero to one efficiency and obtaining sum of product the mean of 23 identified questions in their relative weight and then dividing by total relative weights, the numerical values of effectiveness are calculated that its mathematic function is determined as the following:

$$\text{Effectiveness} = \frac{\sum_{i=1}^{23} bi * ai}{\sum_{i=1}^{23} bi} \tag{1}$$

In second section of the questionnaire, questions number 1-7 assesses power value of suggestion system committee.

Question number 8 is personnel beliefs and question number 9-11 indicate management belief to suggestion system that if scores of each one is less than considered mean , it indicated weakness of that factor.

Deduction Analysis: - One of the performed tests on the obtained data from the questionnaires is t test for independent observations. Aim of doing this test is to compare mean opinions of females and males about effectiveness of the desired and present situation of suggestion system in Gas Company of Yazd province. Formation of the hypothesis about section A of questions that is present situation of suggestion system is:

Zero hypothesis: there is not difference between mean of female and males' opinions about effectiveness of present situation of suggestion system. $H_0: \mu_1 = \mu_2$

Contrast hypothesis: there is difference between mean of female and males' opinions about effectiveness of present situation of suggestion system. $H_1: \mu_1 \neq \mu_2$

The following results were obtained, using SPSS software:

Table 1: Independent Samples Test

		Levene's Test		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper	
mean	Equal variances assumed	1.656	.203	1.795	58	.078	.25952	.14457	-.02987	.54892
	Equal variances not assumed			1.904	57.249	.062	.25952	.13631	-.01340	.53245

According to the obtained results from table 1, hypothesis of variances equality has been tested and accepted in the first test which is known as Levene's test. Also, the obtained results indicates that there is not significant difference between mean of female and males' opinions about effectiveness of present situation of suggestion system in gas company of Yazd province.

Results of the mentioned test about section B of questionnaire questions that is effectiveness of the desired situation of suggestion system is similarly presented in table 2:

Table 2: Independent Samples Test

		Levene's Test		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper	
mean	Equal variances assumed	1.186	.281	.741	58	.462	.11473	.15483	-.19518	.42465
	Equal variances not assumed			.789	57.501	.433	.11473	.14540	-.17637	.40584

Zero hypothesis:the second test performed on data, is ANOVA or Analysis of Variance and compare the mean of opinions of 3 groups from viewpoint of job history, 1.less than 10 years, 2.between 10 to 20 years, 3.up to 20 years.

Formation of the hypothesis about section A of questions is that present situation of suggestion system is hypothesis: there is not different between mean of various group's opinions from viewpoint of job history about effectiveness of the present situation of suggestion system.

$$H_0: \mu_1 = \mu_2 = \mu_3$$

Contrast hypothesis: there is different between mean of various group's opinions from viewpoint of work history about effectiveness of the present situation of suggestion system.

$$H_1: \mu_1 \neq \mu_2 \neq \mu_3$$

Table 3: Homogeneity of Variance

Levene Statistic	df1	df2	Sig.
1.431	2	57	.247

Table 4: ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.084	2	.542	1.782	.178
Within Groups	17.343	57	.304		
Total	18.427	59			

Considering table 3 in which variances equality hypothesis has been tested, the significant level with value 0.247 was obtained. Therefore, zero hypotheses can not be rejected and group variances are supposed equal to each other.

Table 4 shows main output of variance analysis. According to this table, significant level is 0.178 which is greater than 0.05. Thus, zero hypotheses is confirmed that is there are no differences among suggestion mean of different groups in regard to service record related to the effectiveness of the suggestion system existing conditions.

By this test for section B of questionnaire that is ideal condition affecting suggestion system from above mentioned groups' viewpoint, following results have been obtained:

Table 5: Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
2.169	2	57	.121

Table 6: ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.62	2	1.81	6.219	.004
Within Groups	16.59	57	.291		
Total	20.21	59			

A significant level with value 0.121 has been obtained based on table 5, thus we can't reject zero hypotheses and groups' variance is assumed equal.

According to table 6, the significant level equals 0.004 which is less than 0.05. Therefore, zero hypothesis is rejected and opposed assumption is accepted. It means that different group's suggestion averages are different in regard to service record related to the effectiveness of the suggestion system existing conditions. Among 3 groups of repliers, the group with service record more than 20 years has more positive opinion on effectiveness of suggestion system ideal conditions and groups with service record less than 10 years and between 10 and 20 years have nearly same opinion and their mean difference is few.

Data Analysis:

Based on obtained points of questionnaire section A (the results are not provided due to organization dislike), it is observed that suggestion system compared to ninth case – encouraging the thought- has the most effect and compared to eighteenth, official bureaucracy reduction repliers' viewpoint. In addition, suggestion system can have most effects on quality improvement factor and has least effects on official bureaucracy reduction factors; person and organization same aim based on section B point's average of questions.

By comparing obtained averages variance of sections A and B, we observe the most variance is related to 11th component, quality development, which this organization experts believes that the most variance more than predicated value is related to quality development component. Least variance than expected value is observed in 16th case, information increase

Therefore, following table indicates the suggestion system effects amount on each component based on points average and components points average variance in form of paired comparison, too.

Table 7: The amount of suggestion system effect on components in descending order

No. Based on point average per component	No. Based on paired comparison
1 encourage for think	1 encourage for think
2 increase the morale of participation	2 increase the personnel information
3 increase creativeness and innovation	3 increase tendency of team working
4 increase tendency of team working	4 revival of self -believe and self-confidence of personnel
5 revival of self -believe and self-confidence of personnel	5 increase the morale of participation
6 to support cooperation	6 - to support cooperation - Promoting organizational culture - increase responsibility sense
7 increase the personnel information	7 increase creativeness and innovation
8 personnel motivation	8 - productivity of human resource - Reduction of losses
9 to respect the personnel personality and providing need for admiring	9 increase undertaking and loyalty of the personnel
10 productivity of human resource	10 Same direction of person and organization aims
11 - Reduction of losses - Promoting organizational culture	11 personnel motivation
12 Optimized use of financial sources and equipments	12 Increase job satisfaction
13 increase responsibility sense	13 reduction of the possible errors in decision making and performing the tasks
14 -developing and progression of the organization - quality improvement of the performed works in the organization	14 to respect the personnel personality and providing need for admiring
15 Increase job satisfaction	15 decrease official bureaucracy
16 -increase undertaking and loyalty of the personnel -solution of organization current problems and decision making about it - reduction of the possible errors and decision making about performing the tasks	16 -Optimized use of financial sources and equipments - facilitate performing changes
17 Same direction of person and organization aims	17 solution of organization current problems and decision making about it
18 facilitate performing changes	18 developing and progression of the organization
19 decrease official bureaucracy	19 quality improvement of the performed works in the organization

Based on descriptions in paragraph 4-1, combining some questions of questionnaire explains a more general criterion. Table 8 shows suggestion system effect proportion on each general criterion in according to point's average and component point's variance in form of paired comparison.

Table 8: The amount of suggestion system effect on general criterion descending order

No. Based on average of each criteria	No. Based on paired comparisons
1 innovation	1 quality improvement
2 organizational productivity	2 organizational productivity
3 job satisfaction	3 job satisfaction
4 quality improvement	4 innovation

In second section of the questionnaire, the responders have said their ideas about present situation of each components that by observing the mean of obtained scores, it can be concluded that in gas company of Yazd province, the suggestion system has the better situation toward other components in field of notifying about work procedure of suggestion system, also propogandas about suggestion system and rate of gift and award belonged to the suggestion, and it has the worst situation toward other components in field of performed education about suggestion system.

Table 9 indicates current situation of components respectively from high to low.

Table 9: current situation of components in descending order

No	Current situation of components
1	rate of notification about task procedure of suggestion system
2	the performed propogandas about introducing the suggestion system
3	amount of gift and reward belonged to suggestion
4	-obviousness of aims of suggestion system for the personnel - proper performance of suggestion system secretariats
5	-managers' belief toward suggestion system - managers' tendency toward team work and participation in decisions
6	stability of company managers in performing the suggestions

Table 9: Continue

7	percentage of personnel encouragement by related authorities to give the suggestion.
8	time of paying the gift and reward belonged to suggestion
9	personnel belief toward suggestion system
10	Amount of training about suggestion system

In this company, in order to have more effectiveness of suggestion system and considering the strong and weak points that have been extracted from second section of the questionnaires and also the solutions which have been presented according to experts and authorities' opinions of suggestion system in gas company of Yazd province and also evaluating these solutions by the related experts, the following solutions have been suggested in priority order, using AHP technique:

- 1- every aspect support from superior management of suggestion system such as systemic supports like joining the suggestion system with operation assessment system,
- 2- annual actual and proper budgeting for suggestion system ,
- 3- Good management of suggestion system and dynamic secretariat with monthly and frequently statement.
- 4- Calculation and regulation of the presents and aware lists according to the regulation and paying them in the determined intervals from receiving the suggest,
- 5- On time investigating and performing the received suggests,
- 6- To create systemic facility and safety in presenting the suggest
- 7- Annual quantity targeting for suggestion system indexes,
- 8- Making the personnel motivated to establish permanent improvement in organization, for example, effect on assessment of operation, promoting, etc.
- 9- Justification and exchanging congress for the managers with providing other advantages of organizations about suggestion system and explaining the role and place of managers in it and quality of providing suggest by the personnel,
- 10- Performing educational terms in field of suggestion system and its aims.
- 11- Training the authorities to encourage the subset personnel for presenting suggest and fortifying their belief,
- 12- To attract individuals' attention to special problem in order to centralize ideas on it,
- 13- To preference the inner directing (using personnel idea) to outer directing (using the outside organization experts) to solve the problems of organization from superior management of the organization,
- 14- Creating the changing culture in the organization by intelligent using of suggestion system secretariat from the boards, publications, network messages, posters, etc.
- 15- Annual Celebrations in which the better suggests were introduced and its provider shall be encouraged.
- 16- Auditing of the suggestion system

Conclusions:

In this research, a comprehensive questionnaire has been proposed involving all types of questions and criteria related to suggestion system effectiveness which will be used as a valid device in order to evaluate suggestion system effectiveness. In regard to obtained results from questionnaires distributed in Yazd Gas Company and descriptive statistic outputs, the amount of suggestion system on each suggestion system target components has been evaluated according to point's average dedicated to each questions by repliers. Also, components having more variance than expected effectiveness of suggestion system have been recognized by averaging obtained results of questionnaire's question paired comparisons. By using deducing static, independent group's view of males and females and different groups has been compared in regard to years of service and existing ideal condition of suggestion system effectiveness. Finally, some guidelines have been proposed to develop existing condition and classified using analysis hierarchy approach and regarding to experts of participation council.

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