



**Using the European Foundation Quality  
Management excellence model in self-assessment the  
Processes Management under Fuzzy Environment  
(Case study: Godakhtar company)**

**Mohammad Ehsanifar. PhD**

Department Of Industrial Engineering

Islamic Azad University

[M-Ehsanifar@iau\\_arak.ac.ir](mailto:M-Ehsanifar@iau_arak.ac.ir)

**Mahdis Daghineh**

Industrial engineering MS

Islamic Azad University

[mahdisdaghineh@yahoo.com](mailto:mahdisdaghineh@yahoo.com)

**Abstract**

*Organizational excellence model is a methodical paradigm for estimating a performance organization in two parts first one is process and another one is the result of them. The result of these estimates in this model is advantage and disadvantage points and improvable points. For achieving the improvements, list of prioritized plans should be proposed. An organizational excellence model with pre-eminent business has been used as a very affective device for considering the level of stability in the different organizations. By use of these models organization can estimate success rate in their plans also can play self assessment role in different times in the organization, on the other hand they can compare their process with other organizations especially the best one. Pre-eminent models are the answer to this question that, what kind of organization is superior? What goals and conceptions it follows? And what kind of critical is dominant to their competitors? In this essay would be tried to prove the different reasons effective such as leadership, people, strategy and politics, resources, processes, people satisfaction, customer satisfaction, impact on society and key performance results on organization after and before implementation EFQM model in GODAKHTAR Company as a case study. And then offer some alternative which can cause improve.*

**Keywords:** *Self assessment, organizational process, European Foundation Quality Management, Fuzzy Environment*

*1-European Foundation Quality Management (EFQM)*

*2-Fuzzy Environment*



## **I. Introduction**

Many quality awards have been developed in Europe the last 15 years. Their purpose is the improvement of the competitiveness of various types of organizations and there is no doubt that business excellence models, such as the European Foundation for Quality Management (EFQM) excellence model and their basic characteristics are in the focal point of many studies and applications.

The EFQM has a membership of more than 750 European organizations, all of which are committed to improving efficiency, effectiveness and achieving excellence.

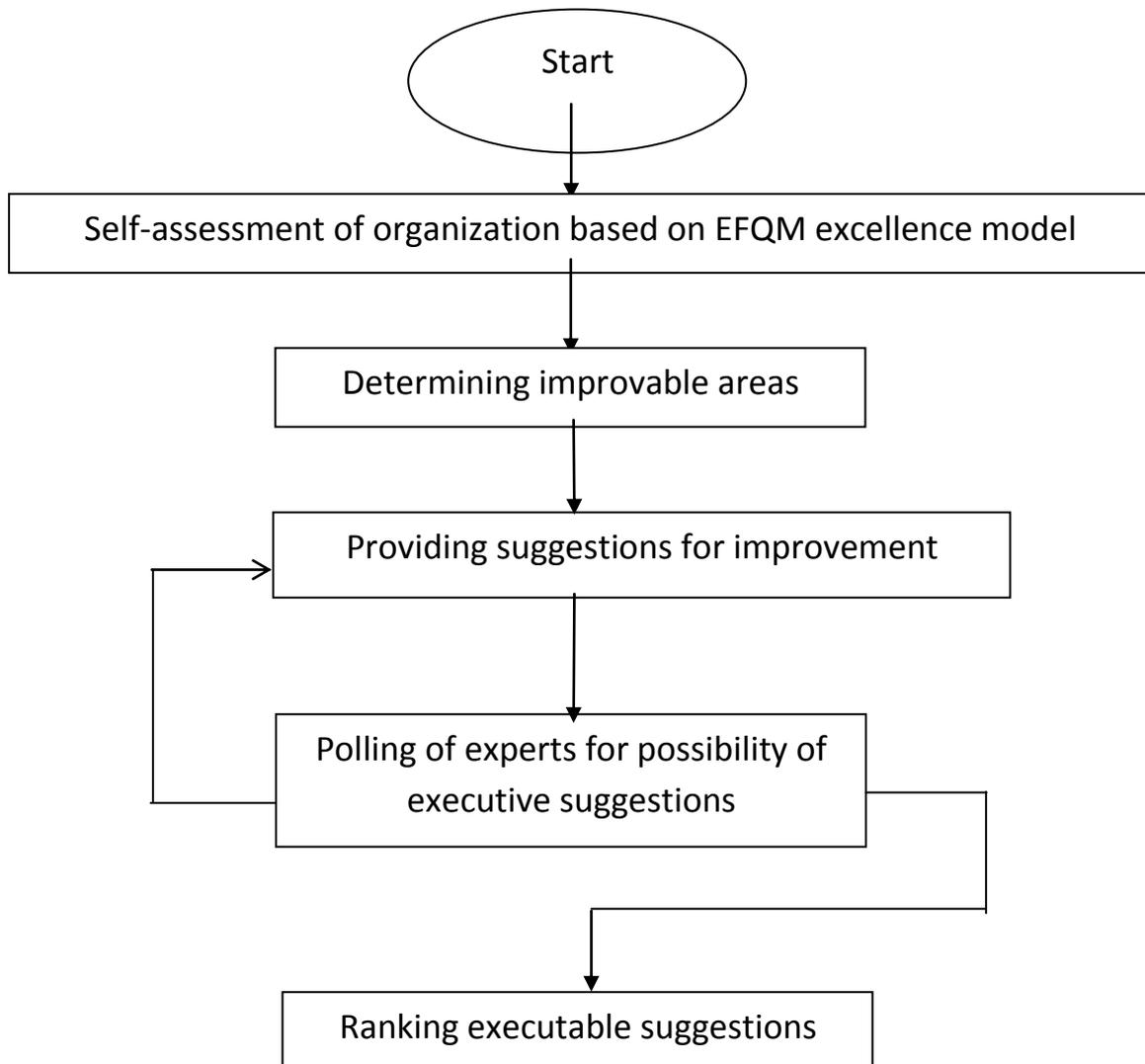
Organizations in Europe and other places widely accept that quality management is a way of managing activities to gain efficiency, effectiveness and competitive advantage. Consequently, it aims at ensuring long – term organizational viability via meeting the needs of their customers, employees, financial and other shareholders and the community at large.

To realize this aims, the EFQM excellence model specifies nine criteria. Five of this are "Enablers" criteria cover what an organization does. The “Result” criteria cover what an organization achieves.

Given the importance of organizational viability, the need for its support and the potentials of the EFQM excellence model, the question arises whether the EFQM excellence model supports the basic functions required to keep organizations viable. (S.M Zargar, 2011)



Chart1 : Conceptual model of applying excellence model (Researcher)



## II. The method of data analysis

In this study after distributing and collecting the questionnaire in the organization the allocated score to each item is measured using fuzzy geometric mean method and finally the programs will be ranked based on multivariate fuzzy method.



### III. New Aspects of Research and Innovation

Lots of studies have been conducted on the excellence model of European Award for Quality in all cases the type of scoring and the analyses of the scores were conducted in the certain mode but in the present study the uncertainty is considered. On the other hand this is the first study that ranks the improvement suggestions in the organizational excellence model using multivariate fuzzy method.

### IV. Weighting the Criteria and Sub-Criteria

**Table1: Weighting the criteria and sub-criteria by the EFQM excellence model  
(serhataydin, 2012)**

Criteria	Sub-Criteria	Weight
Leadership	Involvement of managem	25
	Recognition, appreciation	25
	Quality culture	25
	Support	25
People management	Staff policy	20
	Identification of employees	20
	Involvement for improve	20
	Communication	20
	Expertise	20
Policy and strategy	Quality management	20
	Information	20
	Business plans	20
	Communication	20
	Testing	20



Partnership and resources	Suppliers	20
	Finances	20
	Technology	20
	Knowledge	20
	Equipment and materials	20
Process	Identification of process	20
	Control process	20
	Review and improve process	20
	Stimulate innovation	20
	Process change	20
Customer results	Perception index	75
	Performance indicators	25
People results	Perception index	112.5
	Performance indicators	37.5
Society results	Perception index	50
	Performance indicators	50
Key performance results	Perception index	75
	Performance indicators	75

The analysis is performed on the questionnaire distributed among 20 employees of the organization. Each item has 5 options to be selected that are considered based on triangular fuzzy numbers. The geometric mean of the obtained questions is calculated as fuzzy and after defuzzifications the given score is obtained.



Figure (1):

The geometric mean of triangularfuzzy number i component =

$$(\text{multiplication of } i \text{ selected component})^{1/\text{number of respondents}}$$

(amiri, 1386)

**elbaT2: The scores obtained from self-organization**

<b>criteria</b>	<b>score</b>	<b>max</b>	<b>percent</b>
<b>Leadership</b>	49.03	100	0.49
<b>People management</b>	62.61	100	0.63
<b>Policy and strategy</b>	47.26	100	0.47
<b>Partnership and resources</b>	46.86	100	0.47
<b>Process</b>	48.26	100	0.48
<b>Customer results</b>	75.09	100	0.75
<b>People results</b>	103.96	150	0.69
<b>Societyresults</b>	47.16	100	0.47
<b>Key performance results</b>	109.08	150	0.73
<b>Sum</b>	<b>589.31</b>	<b>1000</b>	<b>0.59</b>

**V. Analysis of Scores Obtained from Self-Assessment**

Based on the tables of the obtained scores the area of managing the employees, the results of the customers, the results of the employees and the key results of performance are in the upper intermediate level and they are considered as the strength points of the organization. But other areas due to obtaining lower than average score are identified as improvable points. Thus the areas of leadership, policy and strategy, resource management, processes and the



results of society are identified as improvable points. The following recommendations are provided to improve the organization.

**elbaT3: The implementation of self-assessment**

Criteria	Alternative
<b>Leadership</b>	Meetings to exchange experiences of similar organizations in order to learn from them about change management
<b>Policy and strategy</b>	Review of proposals to target the suggestions made by employees in order to develop policies and strategies
<b>Process</b>	Similar visits to other companies in order to improve the modeling process
	Organization Structure Reengineering with Process approach
	Reform process order (no order should be lost)
<b>Partnership and resources</b>	The establishment of preventive maintenance
	Review process outsourcing
	Planning, human resource management
	Effectiveness machinery
<b>Society results</b>	Development activities related to environmental protection, including industrial waste management and control of energy resources

**elbaT4: Combining executive's ideas about alternatives**

Alternative	Geometric mean	Defuzzy
<b>1</b>	(2.77, 3.78, 4.78)	3.78
<b>2</b>	(2.66, 3.67, 4.68)	3.67
<b>3</b>	(2.88, 3.89, 4.89)	3.89



<b>4</b>	(3, 4, 5)	4
<b>5</b>	(0, 1.63, 2.71)	1.5
<b>6</b>	(2.66, 3.67, 4.7)	3.68
<b>7</b>	(2.05, 3.1, 4.13)	3.1
<b>8</b>	(2.66, 3.67, 4.68)	3.67
<b>9</b>	(1.76, 2.82, 3.84)	2.81
<b>10</b>	(1.71, 2.78, 3.81)	2.77

According to the management, defuzzification suggestions that their number is more than 3 will select to rank and the remaining proposals will reject.

### VI. Accepted Alternatives

- 1- Meetings to exchange experiences of similar organizations in order to learn from them about change
- 2-Review of proposals to target the suggestions made by employees in order to develop policies and strategies
- 3-Similar visits to other companies in order to improve the modeling process
- 4-Organization Structure Reengineering with Process approach
- 5-The establishment of preventive maintenance
- 6-Review process outsourcing
- 7-Planning, human resource management

### VII. Ranking executable suggestions

Determining criteria and fuzzy decision making matrix

**Table5: fuzzy decision making matrix (dodangeh, 2011)**

criteria	$C_1$	$C_2$	...	$C_m$
Alternative				



$A_1$	$A_{11}$	$A_{12}$	...	$A_{1m}$
$A_2$	$A_{21}$	$A_{22}$	...	$A_{2m}$
...	...	...	...	...
$A_n$	$A_{n1}$	$A_{n2}$	...	$A_{nm}$

**elbaT6: fuzzy decision making matrix**

criteria \ alternative	importance	cost	time
1	(9, 10, 10)	(0, 1, 3)	(0, 0, 1)
2	(7, 9, 10)	(0, 1, 3)	(0, 1, 3)
3	(9, 10, 10)	(1, 3, 5)	(0, 0, 1)
4	(9, 10, 10)	(7, 9, 10)	(5, 7, 9)
5	(7, 9, 10)	(7, 9, 10)	(0, 1, 3)
6	(5, 7, 9)	(3, 5, 7)	(5, 7, 9)
7	(7, 9, 10)	(9, 10, 10)	(9, 10, 10)

**elbaT7:Fuzzy important criteria**

Importance	Cost	Time
(7, 9, 10)	(9, 10, 10)	(7, 9, 10)

Time and cost are among the negative utilities so they should be reversed:



**elbaT8:Fuzzy important criteria depending on the type of utility**

Importance	Cost	Time
(7, 9, 10)	(1, 0, 0)	(3, 1, 0)

Figure (2):

$$\mu(x) = \text{Max} \{ \text{Min} ( \mu(x), c_j ) , \text{Minnegative utility} ( \mu(x), 1 - c_j ) \} \text{ positive utility}$$

(zarabi, 1391)

**elbaT9: Ranking**

Alternative	$\mu(x)$	Defuzzy
1	(3, 2, 0)	1.75
2	(3, 2, 0)	1.75
3	(3, 2, 1)	2
4	(3, 2, 1)	2
5	(3, 2, 1)	2
6	(3, 2, 1)	2
7	(3, 2, 1)	2

Based on calculated  $\mu(x)$  the ranking of suggestions is performed in a way that the suggestion with highest  $\mu(x)$  has higher rank compared to the rest of them and here the suggestions 3,4,5,6 and 7 are placed in the same rank and then 1 and 2 are place in the second rank.

**VIII. Conclusion**

Generally in this study following the organizational excellence purpose Godakhtar gas valves was analyzed and a clear image of the organization was provided based on the weakness points and the areas needing improvement were obtained based on the excellence model of European Award for Quality. The organization equipped with this knowledge can follow the



required steps in improving organizational excellence. Also the results indicate that among the nine fold criteria of excellence model of European Award for Quality, the criteria of the results of the customers was the most important strength point of the organization. The reason of strength in this point is continuous survey and measuring the level of their consent. The available results indicate that the organization has loyal customers that are working with the organization over 10 years. Also the major criteria in need of improvement are the results of society, management of partnerships and resources and policy and strategy. The reasons of low score in these areas are the following factors:

- Lack of communication with state institutions such as welfare, environment and
- Lack of appropriate activities to recycle waste
- Lack of careful review of the strategy set
- Lack of a strong maintenance system
- Lack of supervision on the process of outsourcing

In the real environment governing the industrial organizations, the decision making conditions are based on uncertainty and the provided data are obscure and vague. Hence considering the real and natural language of the business area in a form that it would be possible to make decisions to rank the acceptable areas out of the obscure and vague data is critical. That is why the questionnaire is provided in fuzzy environment and the decision making method is used to rank the executive plans. The results indicate the activities according to which the organization can achieve organizational excellence

### **IX. Alternatives**

1-It is recommended that each team to assess the progress of implementation of operational programs should be organized to regularly review the operation and solved potential problems.

2-In this study, the criteria and sub-weight based on the weight of the Excellence Model of the European Quality Award considered. It is recommended that further research be conducted to calculate the weights of interviews with experts in any organization.

3-The use of other techniques for multi-criteria decision-making in the certain tyorun certainty (fuzzy) can be done in future studies.

4-Comparison of the top organizations in scores can be a new path in future research.

5-This research has gone ranking executive program. Further research is suggested comparison between before and after the implementation of the excellence model used.



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