“Identifying the critical success factors of organization with Analytic Hierarchy Process approach (case study – Iran Argham Company)”

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ARTICLE INFO	Gholam Hassan Pourhanifeh and Mohammad Mahdavi Mazdeh (2016). Identifying the critical success factors of organization with Analytic Hierarchy Process approach (case study – Iran Argham Company). *Problems and Perspectives in Management*, *14*(4), 54-60. doi:10.21511/ppm.14(4).2016.06
DOI	http://dx.doi.org/10.21511/ppm.14(4).2016.06
RELEASED ON	Wednesday, 14 December 2016
JOURNAL	"Problems and Perspectives in Management"
FOUNDER	LLC “Consulting Publishing Company “Business Perspectives”

NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
0	0	0

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SECTION 2. Management in firms and organizations

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Identifying the critical success factors of organization with Analytic Hierarchy Process approach (case study – Iran Argham Company)

Abstract

In today's challenging and complex world, organizations success depends on productivity, continuous improvement in all dimensions and reforming the pattern of resource utilization. Therefore, organizations, while considering restrictions, should focus on the most effective factors or so-called critical success factors. This paper intends to identify and prioritize the critical success factors, among other, factors influencing success of the organization, using hierarchical analysis and application of tools and related software. Analytic Hierarchy Process provides the possibility to compare the factors via creating matrix of paired comparisons. The case study in this research includes identifying the critical success factors and prioritizing them in Iran Argham Company. Finally, among the results presented, five critical success factors are identified from the forty influential factors. These five factors account for about seventy percent of the organization's success. It should be noted that most studies conducted in this area focuse on the certain processes and special systems rather than study on the organization as a whole unit. This model can also be generalized to all organizations, including SMEs, and would provide remarkably valuable approaches, especially in competitive markets.

Keywords: key success factors, strategic management, critical success factors, AHP.
JEL Classification: M10, M14, L21, C44.

Introduction

With the advent to the third millennium, the world is undergoing the rapid changes. These changes are visible in many areas, such as technology and the intensity of environmental complexities, and its result has been the emergence of organizations such as the rapid reaction. In such circumstances, developing the strategic competitive advantage will require a new approach from the large management of organizations. So that, in addition to the detailed and rigorous analysis of the internal, external and competition factors, has special attention to productivity and continuous improvement in all dimensions and reforming the pattern of resource utilization. This subject is more effective, particularly in organizations that are faced with limitation in resources, and don't have the ability of capitalization on all different dimensions of success. Therefore, these organizations should focus on the effective factors or the so-called key success factors, according to their limitations.

The study of key success factors helps managers and researchers to extract the major and strategic activities from the competitive process of trade that are essential for the business success (Butler and Fitzgerald, 1999).

Different people have presented different definitions of the key success factors, but all these definitions have one thing in common: key success factors are factors that attention to them is essential to success and should be considered to ensure the success of organization as continuous (Ranjan and Bhatnagar, 2008). In other words, these factors are more important than other factors, and have higher priority.

The focus of this paper is to identify the key success factors by using the Analytic Hierarchy Process (AHP) as a useful tool to prioritize of factors and in order to provide an appropriate model, respectively.

1. Research method

In this article, using descriptive research, data collection was conducted through the questionnaire design. The research sample consisted of managers and employees of Iran Argham Company. The obtained data from the questionnaires are prioritized through the AHP and by using software of Expert choice and the results are displayed as a hierarchy tree. In the preparing of the questionnaire, in addition to the use of elite and senior management ideas and, in several phases, the contents of the questionnaire are reviewed and revised; in order to further validate, the obtained results are evaluated using Cronbach's alpha coefficient and SPSS software.

2. Literature of research

This section of the paper is allocated to review the principles and definitions of the key success factors and AHP.

2.1. Key and critical success factors. The concept of key success factors was raised for the first time by John Rockat and in the project management studies (Rockat, 1979).

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In the late 1970s, with the development of information systems that led to produce massive amounts of information, organizations are faced with an explosion of data that must be analyzed continuously and, then, they made decision about them. At the same time, MIT researcher John Rukart considered the challenges of CEOs against the sample volume of information. So Rukart focused on developing a practical methodology to help the managers to identify their main information needs. He defines the vital factors of organization as "a few areas in the results of which, if done, will ensure the successful competitive performance for organization". These areas of activity should be protected and cared by the management permanently (Rockat, 1979).

Critical success factors emphasize to a limited number of factors that will ensure the successful competitive performance results for individual, group or organization (Alazmi and Zairi, 2003). If there is not enough focus on these factors, the obtained results of the organization efforts will be less than optimal (Thierauf, 1982).

In other definition, Bruno and Lidker (1984) suggest that the key success factors include parameters, conditions or variables that, if properly managed, can have a significant effect on the success of the organization's competitive position. Moreover, Pinto and Slevin (1987) consider the key success factors as factors which significantly improve the chance of projects implementation.

Critical success factors are a descriptive method and may be used for research in the process of systems development. In this regard, experts found out the deep deviation between the managers and users about their attitudes toward the different systems success (Salmeron and Herrero, 2005).

According to the research of Frund (1988), it is better to ensure the compliance of the critical success factors with conditions, the identification of the factors carried out from higher levels to lower levels of the organization. The process of critical success factors identification should be implemented in various levels of organization, units and even at the level of special working groups (Zhou, Huang and Zhang, 2011). If the process is properly managed, it is clear that can be employed in different levels of the organization and the industry and even greater levels of economic, social and political (Zhou, Huang and Zhang, 2011). Razzaq and Sheng (1998) extend the concept and logic of the critical success factors to the set of supply chain and outsourcing of logistics set, in which elements such as communication, development of relationship, standard setting and performance of control are very important. Power et al. (2001) studied the critical success factors on the business supply chain and identification of seven critical factors such as partnership management, resources management and technology.

To structure the numerous CSFs, success factors can be categorized according to the type of value or intended goal. A clustered overview of CSFs is provided in Figure 1 (Aerts et al., 2014).

In this methodology, using the questionnaires and also review of documents, focused on the core of issues, key success factors of the organization are identified and extracted.

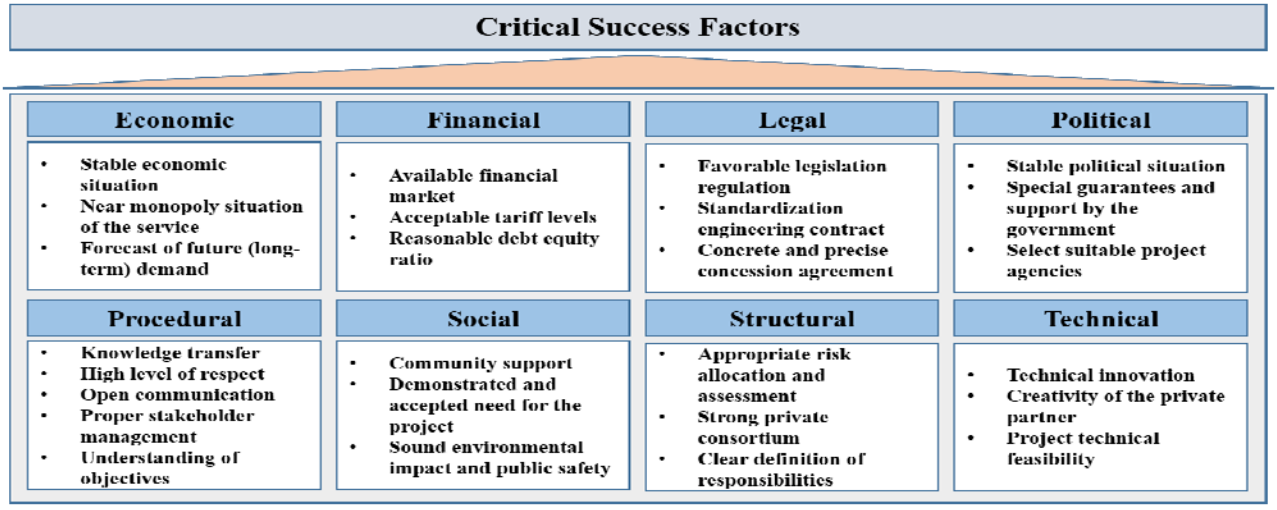

Fig. 1. Cluster overview for critical success factors

Source: Aerts et al. (2014).

2.2. AHP. One of the most efficient techniques of decision-making is Analytic Hierarchy Process (AHP), which was first introduced by Thomas L Saaty in 1980. This technique is established based on the paired comparisons and give managers the ability to evaluate the different scenarios. AHP due to the simple and, at

the same time, comprehensive nature has been welcomed by managers and users (Saaty, 1990).

This process, with analysis of complex and difficult issues, turned them to a simple shape and studied their solution (Saaty, 1990). In general, the following steps should be taken in AHP:

1. Not determine the purpose, criteria, and options.
2. Determine the relationship between the components and the formation of hierarchical structure.
3. Calculate the weight of each criterion in relation to the purpose and the weight of options in relation to standards.
4. Calculate the total weight of each option in relation to the goal with the help of multiply the weights chain from option to target.
5. Ranking criteria and options in relation to the target.

It should be noted that, for the calculation of relative weights, first, elements are compared with each other as paired and the paired comparison matrix (for the elements of each level) is produced. Then, by using this matrix, the relative weight is calculated. More generally, a paired comparison matrix is shown as equation 1, where *aij* is the level of preferred element of *i*-th to the *j*-th now by identifying *aij*, we want to obtain the weight of elements Wi.

$$A = [aij]i, j = 1,2,3,\ldots,n. \quad (1)$$

An important issue here is the inconsistency ratio of paired comparison matrix. Each paired comparison matrix may be compatible or incompatible. It should be noted that the maximum acceptable rate of inconsistency in terms of "Saaty" is equal to 0.1. Note that the options paired comparison together and determine preferences, necessarily must be done by aware decision makers to the options and criteria (Saaty, 1988). However, weighted by AHP has been widely used in many cases (Valle et al., 2014) and is recommended to be used as case studies and regional (Ayalew and Yamagishi, 2005).

2.2.1. Expert choice. Several backup software has been developed for the analysis of hierarchical data that most proposed Expert choice software was developed by Saaty and colleagues (Forman et al., 2000). This software has many capabilities and, in addition to the possibility of designing the decision hierarchical graph and questions designing, determining the preferences and priorities and calculating the total weight, has also the sensitivity analysis ability of decision-making to changes in the parameters of the problem. Most importantly, though, in many cases, benefit the charts and graphs in order to present the results and performances (Saaty, 1990).

3. The case study – Iran Argham Company

3.1. Introduction. Iran Argham Company about half a century of experience is one of the most active and oldest companies of information technology field and, by having the largest network of support services across the country, is the secretary of projects and national designs of software and hardware, and the biggest seller and supporter of ATM systems. The main focus of company's activities is on providing products and services to banks, and such activities include the design and installation of automated banking machines, design and manufacture of automatic machines of payment, production and delivery of computers and devices side, production and development of customers order software, deliver and support of external applications and related sub-systems, and creating banking solutions and the development of the largest customer support network in the country.

The position of Iran Argham Company on the basis of regulations of rankings and qualified of ICT companies, which has been developed by the Supreme Council of Informatics, has achieved the first rank in all matters of its activities.

3.2. Methodology. In this study, a multi-stage methodology is used for their different stages and obtained results to be briefly described.

3.2.1. Literature review. Independent of the type of activity of organization based on articles and conducted researches about the factors affecting on the success of organizations, 40 influential factors on the success of organization, as shown in Table 2, were extract.

Table 1. Influencing factors on the success of organization

Line		Indicator	Factor	References
1	Internal factors	Management features	Management style	Wijwardena and DeZoysa (2000) Tam et al. (2005) Bradley (2008) Umble et al. (2003) Summerill et al. (2010) Kozmenko and Bielova (2015)
2			Planning of managers	
3			Risk of managers	
4			Attitudes of managers around the change axis	
5			Effective management of costs	
6			Communication of managers	

Table 1 (cont.). Influencing factors on the success of organization

Line		Indicator	Factor	References
7	Internal factors	Human resources	Effective monitoring	Bradley (2008) Umble et al. (2003) Serafini and Szamosi (2015)
8			Creating motivation for staff	
9			Team building	
10			Efficient recruitment system	
11		Human resources	Effective motivational system	
12			Coordination work group	
13			Staff development	
14			Training of staff	
15		Product	Research and development	Wijwardena and DeZoysa (2000) Lam and Chin (2005) Schotanus et al. (2010) Bolwijn and Kumpe (1991)
16			Speed of products	
17			Quality of products	
18		Financial	The good cash	Wijwardena and DeZoysa (2000) Bradley (2008)
19			Take advantage of credit	
20		Marketing	Skill in marketing	Wijwardena and DeZoysa (2000) Tam et al. (2005) Alberto and Vasconcellos (1991) Schotanus, Telgen and de Boer (2010) Lekhanya (2015)
21			Penetrate to new markets	
22			New product development	
23			Marketing research	
24			Appropriate pricing	
25			Buy the right system	
26		Relationship with customer	Identification of customer needs	Wijwardena and DeZoysa (2000) Alberto and Vasconcellos (1991) Schotanus, Telgen and de Boer (2010)
27			Achieving the customer satisfaction	
28			Effective communication with customers	
29			Customer loyalty	
30	External factors	Understanding the situation	Understanding the strategies of competitors	Bolwijn and Kumpe (1991) Keep, Omura and Calantone (1994)
31			Understanding the strengths and weaknesses of competitors	
32		Technological factors	Advertising technology changes	Montequin et al. (2014) Trkman (2010) Alberto and Vasconcellos (1991) Keep, Omura and Calantone (1994)
33			Recognition of modern technology	
34		Economic factors	Economic policies	Tam et al. (2005) Bradley (2008) Islam (2010) Yumei (2012)
35			Economic growth or recession	
36			Unemployment and wages rate	
37		Political factors	Political stability	Wijwardena and DeZoysa (2000) Islam (2010) Yumei (2012)
38			Communication and external relations	
39		Cultural factors	Cultural factors	Trkman (2010) Summerill et al. (2010) Yumei (2012)
40		Branding	Brand reputation	Alberto and Vasconcellos (1991) Schotanus, Telgen and de Boer (2010)

It should be noted that the factors depending on the type of activity and the scope of considered industry and in various internal and external conditions can be different.

Also by using informatics industry experts and professionals and senior managers' ideas of Iran Argham Company, by the questionnaire and according to the concessions, in the first stage, 15 influential factors, according to Table 3, were extracted.

At the end of the mentioned questionnaire, a written question to the influential factors that are not seen in Table 2, was recorded to be included in Table 3.

Table 2. Success important factors in the literature

Factor	Factor
Management style	Staff development
Planning of Managers	Training of staff
Risk of managers	Effective communication with customers
Effective management of costs	Effective sales system
Effective recruitment system	Research and development
Creating motivation for staff	Understanding the strategies of competitors
Team building	Cultural factors of organization
Effective motivational system	

3.2.2. Developing and completing the questionnaire. In order to prioritize the identified factors, a questionnaire was designed with the questionnaire design principles such as simplicity, clarity, clarity of content, etc., on a

5-point Likert scale. In order to the validity of the questionnaire, it was evaluated by the senior managers of Iran Argham Company and industry experts, and its limitations were resolved. This questionnaire was completed by 30 qualified managers, including the level of experience, knowledge and proficiency on the industry and competitors, and others.

3.2.3. Validation. To validate the obtained data, despite the ideas of professional experts and elites, the Cronbach's alpha coefficient is used, and is performed using SPSS software. The obtained number equal to 0.81 represents the proper reliability of questionnaire.

3.3. Prioritization of the AHP approach. According to the circumstances and resources, and also senior managers and specialists and related experts' ideas, initially necessary comparisons were conducted as a couple among the obtained factors that in Table 3 mentioned, and after discussion and investigation in stages, the matrix of paired comparisons as Table 4 were extracted. This matrix shows the importance level of each factor in relation to other factors and shows the relationship between different factors.

Table 3. The paired comparison matrix of factors affecting on the success of organization

		C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15
Management style	C1	1	3	4	7	9	4	6	8	6	5	4	7	8	8	6
Planning of managers	C2		1	2	6	9	2	5	8	5	3	3	6	7	8	4
Staff development	C3			1	6	8	1	5	8	5	3	2	6	7	7	4
Effective management of costs	C4				1	5	0.2	0.5	4	0.5	0.33	0.33	2	3	3	0.5
Effective recruitment system	C5					1	0.13	0.14	0.5	0.2	0.13	0.17	0.2	0.33	0.5	0.2
Creating motivation for staff	C6						1	5	7	4	2	2	6	7	7	3
Team building	C7							1	6	1	0.33	0.33	3	4	5	1
Effective motivational system	C8								1	0.25	0.14	0.17	0.25	0.5	1	0.2
Risk of managers	C9									1	0.5	0.33	3	4	4	1
Training of staff	C10										1	1	4	5	6	2
Effective communication with customers	C11											1	4	5	5	2
Effective sales system	C12												1	3	3	0.33
Research and development	C13													1	1	0.33
Understanding the strategies of competitors	C14														1	0.25
Cultural factors of organization	C15															1

After collecting the questionnaires and the removal of unacceptable results statistically, the obtained results were summarized and, as a primary input, were entered to EC software. This application, as previously mentioned, provides the possibility of analysis by AHP. The obtained results are shown in Figure 2 from the output of this software.

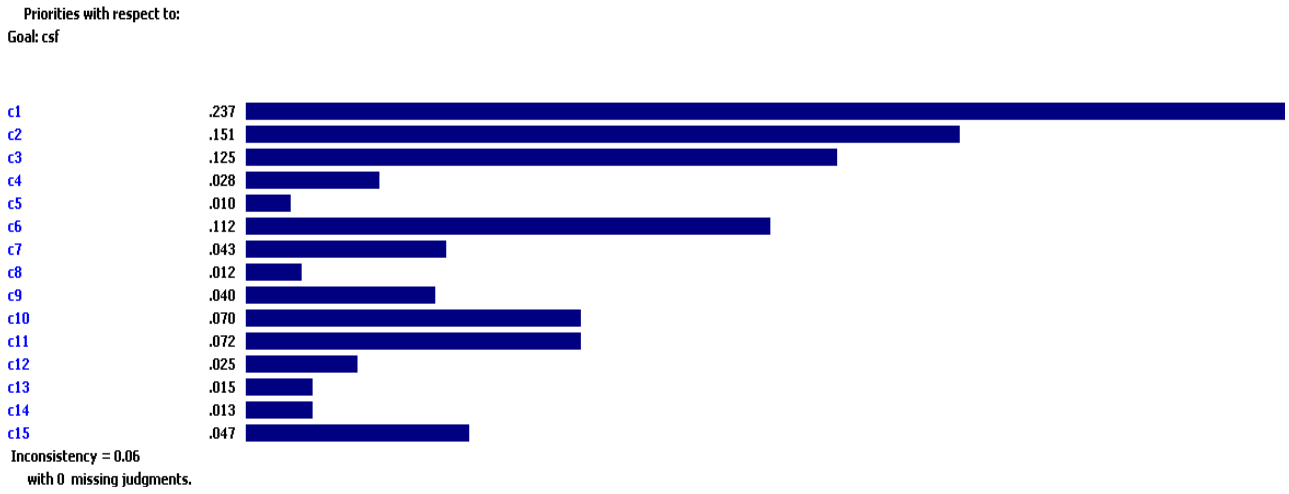

Fig. 2. The output of EC software

As shown in the figure, the incompatibility rate 0.06 is acceptable and indicates the validity and reliability of the obtained results. According to the obtained results, it can be shown the prioritization of the organization's key success factors and the level of penetration coefficient of each factor in Iran Argham Company, according to Table 4.

Table 4. Prioritization of influencing factors on the organization success

Factor	Coefficient	Rank
Management style	0.237	1
Planning of managers	0.151	2
Staff development	0.125	3
Creating motivation for staff	0.112	4
Effective communication with customers	0.072	5
Effective training of staff	0.070	6
Cultural factors of organization	0.047	7
Team building	0.043	8
Risk of managers	0.040	9
Effective management of costs	0.028	10
Effective sales system	0.025	11
Research and development	0.015	12
Understanding the strategies of competitors	0.013	13
Effective motivational system	0.012	14
Effective recruitment system	0.010	15

The penetration coefficient of each factor indicates the importance and impact level of that factor.

Table 4 indicates that management style with coefficient 0.237 is allocated at the first rank in this priority, after that factor, planning of managers with coefficient 0.151 at the second rank, staff development with coefficient 0.125 at the third rank, motivating for employees with coefficient 0.112 at the fourth rank and effective communication with customers with coefficient 0.072 at the fifth rank, respectively. In other words, these five factors that play an important role in the success of the organization can be called critical success factors of Iran Argham Company.

Conclusion

Awareness to the key factors of organization in many cases helps the organizations and causes more effective decisions making. The benefits of identifying and implementing of the key success factors can be cited as follows:

- With a greater focus on these factors, the impact level of them is intensified and its impact can be maximized.
- Help managers in using available resources and facilities and, thus, revising the pattern of their use.
- Accelerate the success of the organization by faster removing of barriers. This issue, especially in today's business markets and the growth rate of organization changes of the new millennium, so-called rapid response organization, considers as one of the most important business competitive advantages.
- Prevent the imagination and perceptual errors of managers based on the importance of some factors than other factors and consider the prioritization as reality and prevent the occurrence of various errors.

According to the study, most influential factors can be considered, i.e., the critical success factors in order of preference, managerial style with JIF 0.237, long-term and short-term planning of managers with coefficient 0.151, staff development with coefficient 0.125, creating motivation in staff with coefficient 0.112 and effective communication with customers with penetration coefficient 0.072. That all these five factors will affect about seventy percent on the success of the organization.

It should be noted that factors such as effective sales system and management of costs considered the critical factors of organization, with coefficient 0.025 and 0.028 are placed in the eleventh and tenth levels.

It is noteworthy that the strength of managers and choosing the effective styles of management, and strategic planning and management of organization, and human resources are factors that have a significant role in the success of the organization.

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