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Prioritizing the Aspects of Project Management Agility Using Contractors' and Employers' Perceptions and Expectations by DEA Method in a Case Study in Foolad Technique Co.

Hadi Shirouyehzad[1] , Arash Shahin[2] , Mina Dayani[3*]

[1]Department of industrial engineering, Faculty of Engineering, Najafabad Branch, Islamic Azad University, Najafabad, Isfahan, Iran (Hadi.shirouyehzad@gmail.com)

[2] Department of Management,University of Isfahan,Isfahan, Iran (Arashshahin@hotmail.com)

[3]Department of industrial engineering, Faculty of Engineering, Najafabad Branch, Islamic Azad University, Najafabad, Isfahan, Iran (Minadayani@gmail.com)

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ABSTRACT

Agile project management concept was introduced in the 21st century for the first time to provide continuous and timely software to provide value to the shareholders. This method is also useful for a variety of projects to respond to environmental changes. As a dynamic business area, always there is a balance between the current and desired status of project-based organizations for which the study of the agile gap is important. In addition, there is no exact definition for desired status. Therefore, studying perception and expectation of contractors and employers is playing a main role for agile project management analysis. In this paper, data envelopment analysis has been applied to identify the most critical agile project management dimensions, based on the difference between contractors' and employers' perceptions and expectations. The case study includes six projects in Foolad technique Co. , the results showed that the following criteria are in critical condition in Foolad Technique Company: "team capabilities", " Customer Involvement", " Delivery Strategy" and "organizational environment"

*Corresponding author name: Mina dayani E-mail address: Minadayani@gmail.com

1. Introduction

In recent years, project based orientations is being employed in many organizations as a central viewpoint, so all their activities and measures are done based on their projects. Project management is a useful instrument for the management of such activities. In such a complex organizational environments, project management techniques can be employed (Munns and Bjeirmi1996). One of the most important Technique in Project management is agile project management. APM was born in the twenty first century. Prominent software developers from both IT and software engineering domains, convened to arrive at a consensus on how the software development industry could produce better results (Hass2007). The literature on agile project management is still in its infancy, but much more research should be done in to agile project management outside the scope of software development. Included in this research should be the development of project management patterns extensible into agile projects in general (Fernandez and Fernandez2009). The fundamental principle of APM is, therefore, a shift from the traditional and prescriptive "plan-then execute" project paradigm (Leybourne2009). Agility attitude is focused on the behavior and environment rather than focusing on the process and methodology.

Hallgren and Olhager (2009) and Narasimhan et al (2006) concluded that agile manufacturing has a significant impact on flexibility, delivery, quality and ultimately customer satisfaction. Further studies in agile manufacturing focusing on flexibility, customer satisfaction and quick delivery includes (Zandi and Tavana2011). Since the customer is one of the most important elements of project management, it plays a crucial role in project managers' decisions (Kenboy and Morgan2011). In agile projects, customer collaboration is essential in all phases of the project, and is one of the important factors which leads to success in these types of projects (Hoda et al2011).

One of the techniques used in management is Data Envelopment Analysis which attracts much attention over the past two decades as a management tool. By considering multiple variables and constraints, this technique can be used in lunching appropriate plans for organizations. DEA is a linear programming method for evaluating the efficiency and effectiveness of decision-making units. This method can also be used to identify the most important aspects of quality of services in any organizations (Shirouyehzad etal2012).

The agility model has been proposed in recent years and some studies are carried in this area. Some findings that somehow related to this subject are as follows:

Sato et al (2006) analyzed seven projects from both academic and governmental environments. From the point of view of tracking an agile process. They classified the projects using the XP-EF framework, and they showed that all projects had a higher desired score for every practice, showing their willingness to improve in all XP practices. The difference between actual and desired scores can point the team to the most important points of improvement. Also they introduced retrospectives and their posters as a complementary tools to tracking, helping the team to understand the project pace. And the team experience and the coach's influence were introduced factors that can influence the adoption of an agile approach.

Chow and Cao (2008) studied on the critical success factors of agile software development projects using quantitative approach. Based on existing literature, a preliminary list of potential critical success factors of agile projects were identified and compiled. These were Management Commitment, Organizational Environment, Team Environment, Team Capability, Customer Involvement, Project

Management Process, Project Definition Process, Agile Software Techniques, Delivery Strategy, Project Nature, Project Type and Project Schedule. Subsequently, reliability analysis and factor analysis were conducted to consolidate this preliminary list into a final set of 12 possible critical success factors for each of the four project success categories – Quality, Scope, Time, and Cost. After that a survey was conducted among agile professionals. The results revealed that only three critical success factors for Agile software development projects: (a) Delivery Strategy, (b) Agile Software Engineering Techniques, and (c) Team Capability were supported.

Shirouyehzad et al (2012) measured services quality based on customers' point of view in four-star hotels in Isfahan. In that paper, data envelopment analysis has been applied to identify the most critical service quality dimensions, based on the difference between customers' perceptions and expectations. The findings implied that price, reliability and tangibles are the most important service quality dimensions.

Stankovic et al (2013) verified the classification of critical success factors previously described in study by Chow and Cao (2008). Their results match with the results from the previous study in suggesting that strong executive support and project type has no influence on the success of agile project. But they introduced Customer involvement, Project management process, agile software engineering techniques and Project nature as the effective factors in agile management.

The literature on agile project management is still in its infancy, but much more research should be done in to agile project management outside the scope of software development. So the purpose of this study is to extract all efficient criteria for the agility of project management in non-software areas. In this paper, data envelopment analysis has been applied to identify the most critical agile project management dimensions, based on the difference between customers' perceptions and expectations. The case study includes six projects in Foolad Technique Co. To this end, three questionnaires were designed to measure the perceptions and expectations of employers and contractors. The data collected from the questionnaires is considered as an input and output for DEA model. In this case, according to the awareness of the perceptions and expectations, it will be clear that which aspect gains the highest satisfaction in agility and which aspect needs more attention. In addition, it will be clear that which measures of project agility are in critical condition, are in good condition and which needs improvement and enhancement. In the following, a brief introduction of agile project management and DEA approach, new methodology, and findings are proposed and finally results are discussed and conclusions are made.

In the following, a brief introduction of agile project management and DEA approach, new methodology, and findings are proposed and finally results are discussed and conclusions are made.

2. Agile project management

Undoubtedly, project management is one of the most important and widely used branches of management over the past few decades. Different definitions are expressed in this regard. In 1971, Oisen defined project management as utilizing different tools and techniques for the proper use of resources to meet the project objectives in the determined scope, time, cost and quality (Oisen1971).

Traditional methods of project management cause the companies lose their competitive advantage in business, therefore it leads to their failure in today's competitive world. Agile project management has emerged as a powerful framework and in line with the rapid development of information technology and along with other software methodologies. The APM approach, based on the principle of human interaction management, is highly dependent on human collaboration. Working practices of APM focus on frequent, sustainable iterative deliveries by multi-functional, intercommunicative teams. Agile

processes and methods have led to worthwhile improvements in project management, organizational skills, productivity, quality, and business satisfaction (Chen2007).

The official definition of Agile Software Development was contained in a form of ‘‘manifesto’’ in February 2001 by a group of 17 noted software process methodologists, who attended a summit meeting to advocate for a better way of developing software and then formed the Agile Alliance. The ‘‘Manifesto for Agile Software Development’’ posted on the Agile Alliance website (<http://www.agilemanifesto.org>) (Chow and Cao2008).

3. DEA

DEA as a mathematical approach is a suitable instrument for measuring efficiency of decision making units with multiple inputs and outputs. Over the past two decades, DEA has attracted much attention as a management tool and is being used for estimating the efficacy of many private and public sector, such as banks, airlines, hospitals, universities, and production (Chee-Cheng 2008). In 1957, Farrell used a method, similar to measuring efficacy in engineering subjects, to measure the performance of a manufacturing unit. In 1978, Charnes et al. developed Farrell’s viewpoint and introduced a model called "Measuring the efficiency of decision-making units". This model is able to assess the relative efficiency of a set of DMU with multiple input and output (Charnes et al. 1978).

As the production function is often unclear, DEA can estimate the frontier of production function by all DMU's . DMU’s are organizational units such as banks, universities and hospitals which typically do the same job. A DMU usually uses a set of inputs (resources) to produce outputs (products) (chee-Cheng, 2008).

The two main types of DEA model includes CCR, which was introduced by Charnes, Cooper and Rhodes in 1978, and BCC, which was introduced in 1985 by Banker, Charnes and Cooper. DEA analysis can be input- or output-oriented (Rassafi and Vaziri, 2007).

Multiple model (primary) of BCC input-oriented is as follows

$$MAXZ_0 = \sum_{r=1}^{s} u_{ri} y_{r.} + \text{w}$$

$$st: \quad \sum_{i=1}^{s} v_i x_{i.} = 1 \qquad r = 1,2,\dots,s \qquad (1)$$

$$\sum_{i=1}^{m} v_i x_{ij} - \sum_{r=1}^{s} u_r y_{rj} - w \le 0 \qquad j = 1,2,\dots,n$$

$$u_r, v_i \ge \varepsilon \qquad \text{w } unlimited$$

In the formula (1) i is the number of input and r is the number of output, j is the number of DMUs (Banker et al. 1985).

y_{rj} is the amount of j output produced by DMUi, and x_{ij} is the amount of j input produced by DMUi (Banker et al. 1985).

u_r is the given weight to r output and v_i is the given weight to the i input (Banker et al. 1985).

In the above models u_r وv_i ، w_z are the variables of the problem.

Benchmark (BM) is one of other available methods to rank. In this technique, DMU_{BM} is made and this DMU is added to other problem DMUs to solve CCR. Here, this technique is efficient if an appropriate criterion to select DMU_{BM} is found.

4. Methodology

The purpose of this study is to extract all efficient criteria for the agility of project management in non-software areas through the study on the organizational agility factors and experts survey. Therefore by doing a study in a project-driven organization, the effective criteria in project management agility and perceptions and expectations of contractors and employers of these criteria are explored. Then the criteria are ranked based on the perceptions and expectations of the whole organization. This study plans to present a model by a 5 step process in order to priority the effective criteria in agility project management in non-software industry and then to measure the criteria. In this paper, DEA is used to identify and analyse the most important dimensions based on contractors and employers' expectations and perceptions in different projects. Based on DEA methodology, a DMU with lower input and higher output will have higher efficiency compared to other units.

The steps of the study are summarized as follows:

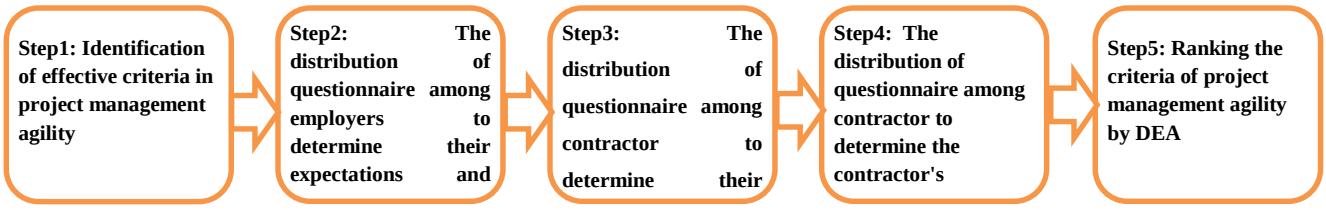

Figure 1. Inputs and outputs of the proposed DEA model

1. Identification of effective criteria in project management agility
2. The distribution of questionnaire among employers to determine their expectations and perceptions of desirable and current conditions of factors contributing to the project management agility
3. The distribution of questionnaire among contractor to determine their expectations and perceptions of desirable and current conditions of factors contributing to the project management agility
4. The distribution of questionnaire among contractor to determine the contractor's understanding of employer's expectations of desirable and current conditions of factors contributing to the project management agility
5. Ranking the criteria of project management agility by DEA

Step 1

By doing comparative studies between parameters obtained and all studies done, it seems that the study done by Chow and Cao in 2008 was more comprehensive than other studies, and its indicators encompasses all the criteria for project management agility.

Therefore, a questionnaire was distributed among some management students, professors familiar with project management agility topics, and also some managers of organizations run by traditional methods. Values and statements of management of agile project were explained to them. Then, they were asked to identify the criteria contributing to the project management agility in non-software industries or add more criteria to the previous ones.

As a result, of 5 aspects, 12 criteria and 39 sub-criteria in Chow and Cao study (2008), 3 sub-criteria were omitted due to incompatibility with the organization under study, namely " Well-defined coding standards up front," " Correct integration testing" and " Project nature being non-life-critical"; and a sub-criteria, "developing short-term timing cycles instead of long-term timing cycle ", was added to a criteria named "Project Schedule" to better measure it. Also, the 2 main criteria "Project Nature" and "Project Type" were omitted, with the former due to incompatibility of the sub-criteria with nature of the organization and the latter due to correlation of the associated sub-criteria with the "Delivery Strategy". On the other hand, one of the key aspects of the project called "Project factors" was eliminated and the criteria related to this aspect were added to "process factors", due to their high correlation. Therefore, 4 key success factors in the project, 10 main criteria and 37 sub-criteria were obtained, as they are shown in Table 1.

Table 1. Critical agile project management dimensions

Dimension	Variable	Item attribute
ORGANIZATIONAL FACTORS	Management Commitment	Strong executive support
		Committed manager
	Organizational Environment	Cooperative organizational culture instead of hierarchal
		Oral culture placing high value on face-to-face communication
		Organizations where agile methodology is universally accepted
		Reward system appropriate for agile
		Facility with proper agile-style work environment
		Appropriate platform technologies and tools
	Team Environment	Collocation of the whole team
		Coherent, self-organizing teamwork
		Projects with small team
		Projects with no multiple independent teams
PEOPLE FACTORS	Team Capability	Team members with high competence and expertise
		Team members with great motivation

Table 1. Critical agile project management dimensions

Dimension	Variable	Item attribute
		Managers knowledgeable in agile
		Managers who have adaptive management style
		Appropriate technical training to team
	Customer Involvement	Good relationship between employer and contractor
		Strong employer commitment and presence
		Employer having full authority
PROCESS FACTORS	Project Management Process	Following agile-oriented requirement management process
		Following agile-oriented project management process
	Project Management Process	Following agile-oriented configuration management process
		Good progress tracking mechanism
		Strong communication focus with daily face-to-face meetings
		Honoring regular working schedule
	Project Definition Process	Project scope well-defined
		Assessing the costs
		Projects with up-front cost evaluation done
		Projects with up-front risk analysis done
	Project Schedule	Projects with dynamic, accelerated schedule
		developing short-term timing cycles instead of long-term timing cycle
TECHNICAL FACTORS	Agile Techniques	Pursuing simple activity
		reviewing and remodeling the plans to achieve the desired results and adjustment of requirements in accordance with changes
		Rigorous review and restricts of the programs
		Right amount of documentation
	Delivery Strategy	timely delivery of stakeholders' priorities in short time intervals
		Regular delivery of software
		prioritizing the delivery of requirements set by the employer
		Delivering most important features first

Table 1. Critical agile project management dimensions

Dimension	Variable	Item attribute
		changeability in project span (considering the basic requirements)

Step2

According to 10 criteria and 37 sub-criteria obtained in the first stage, a questionnaire is distributed among employers to understand their perceptions and expectations. The questionnaire is designed in two sections. The first section includes 7 items, the first 2 items are about project information and the 5 other questions are related to demographic information including gender, position, work experience, age and education. The second section consists of 37 bilateral questions (74 items) to determine employers' expectations and perceptions of desirable and current conditions of factors contributing to the project management agility. On the right side of the questionnaire the employer should rate the importance of these factors in project management agility, using a 5-point Likert scale. On the left side of the questionnaire the employer should rate the existence of these factors in the contractor's organization, using a 5-choice Likert scale. Here, the number related to each category and sub-category is obtained by calculating the arithmetic mean of the values of each category obtained by the projects of the organization. The result is a number between 1 and 5, and shows the employer's perceptions and expectations in the related projects.

To assess the validity of the questionnaire, first the indicators in other research were used. Then on several occasions, the pilot questionnaire was distributed among professors and students of management and IT who were familiar with project management agility. After clarifying the objectives and hypothesis of the project, they were asked to declare their opinions with regard to the relevance of the questions with the subject and the research hypotheses, ambiguity in the questions, and the possibility of multiple interpretations of the questions. Thereupon on several occasions, the pilot questionnaire was distributed among the experts familiar with project management agility. This resulted in correction, elimination and addition of some parameters based on the conditions and environment of the research. Finally, the questionnaire was designed in a way that reflects the indicators of project management agility. After doing the revision and verification of content and face validity, the questionnaire was distributed.

To assess the reliability of the questionnaire, Cronbach's alpha coefficient was used. To this end, a bilateral questionnaire was distributed among employers. Using the data obtained from the questionnaire, SPSS software and Cronbach's alpha coefficient, we were able to calculate the reliability for the whole questionnaire, each of the main categories, sub-categories and expectations and perceptions, separately. It should be noted that the Cronbach's alpha coefficient above 7.0 indicates high reliability, between 5.0 and 7/0 indicates acceptable reliability and less than 5.0 indicates poor reliability.

Step3

Such a previous step, a questionnaire is distributed among contractor to understand their perceptions and expectations of desirable and current conditions.

Step4

The third questionnaire is designed in two sections, too. The first section is as the same as the previous questionnaires. The second section consists of 37 questions to determine contractor's understanding of employer's expectations of desirable conditions. The contractor should rate him understanding of these factors, using a 5-choice Likert scale.

Step5

In this step, DEA is used to identify and analyses the most important APM dimensions based on contractor's and employer's expectations and perceptions in different projects. Since perceptions and expectations values are inputs and outputs of DMUs respectively. Each DMU has three inputs and two outputs. The model is demonstrated in Figure 2. In other hands, APMs are considered as DMUs and organizations' data are considered as inputs and outputs of DEA model. Based on DEA methodology, a DMU with lower input and higher output will have higher efficiency compared to other units.

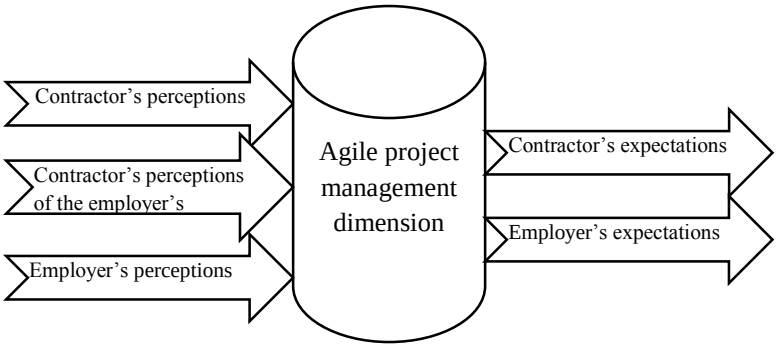

Figure 1 Inputs and outputs of the proposed DEA model

International Engineering Company of Foolad Technique is one of the largest Engineering companies in Isfahan, which began its activities in 1991. In 2012, the Company, as a leading engineering company in the province which has lots of developmental plans, was recognized as one of the most advanced departments in quality control. Due to the sensitive nature of the projects, the need to present a method for improving the quality of projects is seen. Foolad Technique Company works on many projects, in some of which is an employer and in others a contractor. Due to the importance of projects in which the Company works as a contractor, such projects were chosen as the purpose of the present study. Among all these projects, we were permitted to work on only six. Four out of six projects were related to projects done in Abarkooh Steel Company and two projects were related to the projects in Isfahan Steel Company (Zob Ahan Company).

The sample population of this study consisted of 24 managers of two "Tavazon" projects. Due to the availability of the projects, these six projects were selected. Because of the limitation of sample population sampling was not done and we studied the whole population.

To study the sample population, three questionnaires were distributed among project management experts, contractors (project managers of Foolad Teknik Company) and Employers of Abarkooh steel projects and agglomeration and raw material stock in Zob Ahan Steel Company.

5. Findings

Input and output variables of this model were determined by calculating the arithmetic mean of perceptions and expectations of employers and contractors in all 6 projects done in Foolad Teknik Company.

Based on the questionnaires, the obtained arithmetic means of the studied projects in each of the indicators can be seen in Table 1, separately. As it can be seen, the criterion, namely "Project Definition

Process", received the lowest employers' perceptions and contractor's understanding of employer's expectations. The criterion, namely "Organizational Environment", received the lowest contractor' perceptions. Also the criterion, namely "Delivery Strategy", received the highest employer' expectation and the criterion, namely "Customer Involvement", received the highest contractor' expectation.

Table 2. Input and output variables in 6 projects

	Input 1	Input 2	Input 3	Output1	Output2
DMUs	Employer's perceptions	Contractor's perceptions	Contractor's perceptions of the employer's exaptation	Employer's expectations	Contractor's expectations
Management Commitment	3.917	3.333	4.013	4	3.875
Organizational Environment	2.945	3.028	3.792	3.765	3.822
Team Environment	2.937	3.29	3.445	3.212	3.187
Team Capability	2.933	3.517	4.05	3.517	4.25
Customer Involvement	3.725	3.998	4.158	3.913	4.278
Project Management Process	3.097	3.43	3.833	3.447	3.778
Project Definition Process	2.708	3.27	3.353	3.478	3.332
Project Schedule	2.862	3.415	3.6	3.502	3.528
Agile Techniques	3.583	3.5	3.875	4.167	3.667
Delivery Strategy	2.875	3.167	3.708	3.667	3.792

So, because of variable return to scale, the problem must be solved by BCC. Moreover, the purpose of the study is the analysis of input and output variables, the problem will be solved based on input- and output-oriented mode. Therefore, the model used in this research is modified BCC input- and output-oriented model.

When using the input-oriented mode, efficacy is calculated by assuming the input constant and trying to reduce the output. Therefore, we can clarify the effect of employer's and the contractor's perceptions on ranking the agility criteria in Foolad Technique's projects. When using output-oriented mode, efficiency is calculated assuming output constant and trying to increase the input. Therefore, we can clarify the effect of employer's and the contractor's expectation on ranking the agility criteria in Foolad Technique's projects. The results of ranking the criteria in input- and output-oriented mode are shown in table 3.

Table 3. Solving DEA problem in two way

DMUs	Efficiency	
	input oriented	output oriented

Table 3. Solving DEA problem in two way

DMUs	Efficiency	
	input oriented	output oriented
Management Commitment	1	1
Organizational Environment	1	1
Team Environment	0.986	1.084
Team Capability	1	1
Customer Involvement	1	1
Project Management Process	0.964	1.048
Project Definition Process	1	1
Project Schedule	0.973	1.033
Agile Techniques	1	1
Delivery Strategy	1	1

Based on DEA methodology, a DMU with lower input and higher output will have higher efficiency

Compared to other units. Lower organization performance and higher importance from Contractors and employers' point of view in a special dimension may lead to efficiency of the units which shows the weakness of projects in satisfying contractors. Therefore in this methodology, the most critical APMs which may have higher output and lower input value in agile project management have the highest efficiency value compared to other dimensions and to achieve agility, the improvement of this factor is of high importance. So the results shows that criteria's as Management Commitment, Organizational Environment, Team Capability, Customer Involvement, Project Definition Process, Delivery Strategy and Project Schedule, are prior to other dimensions in managers' decision making. The lowest comparative values of APMs were also referred to Project Management Process.

Because of non-apex DMUs, the mentioned technique is not able to rank DMUs. Therefore BM is employed to consider DMU_{BM} with the least input value & the most output one. Ranking efficient DMUs will be:

The results of ranking the criteria in input-oriented mode, with regarding ε =0.0006 are shown in table 4.

Table 4 Ranking by BM method

DMUs	Input 1	Input 2	Input 3	Output1	Output2	Efficiency	Ranking
	Employer's perceptions	Contractor's perceptions	Contractor's perceptions of the employer's expectations	Employer's expectations	Contractor's expectations		
Management Commitment	3.917	3.333	4.013	4	3.875	0.9075	5
Organizational Environment	2.945	3.028	3.792	3.765	3.822	0.9991	1
Team Capability	2.933	3.517	4.05	3.517	4.25	0.9225	4

Customer Involvement	3.725	3.998	4.158	3.913	4.278	0.8059	7
Project Definition Process	2.708	3.27	3.353	3.478	3.332	0.9989	2
Agile Techniques	3.583	3.5	3.875	4.167	3.667	0.8647	6
Delivery Strategy	2.875	3.167	3.708	3.667	3.792	0.9554	3
DMUs	2.708	3.028	3.353	4.167	4.278		

Table4 shows that "Organizational Environment" critical has the highest ranking and Foolad Technique must be pay attention to improve this critical more than others. It must be enhanced by their sub-criteria.

So Cooperative organizational culture, Oral culture, Accepting agile methodology, Reward system appropriate, Facility with proper agile-style work environment and appropriate platform technologies and tools are the most important criteria in Foolad Technique for accessing agile project management.

6. Conclusions

An agile organization is a fast, friendly and informed business that has the ability to adapt in response to unexpected and unforeseen events and advancements, market opportunities and customer's needs. Therefore, because of the changing environment and the inability of traditional project management to move in this environment, the need for agile project management for the survival of the organizations is more urgent. On the other hand, because of the significant role of the employer in this type of management and because all activities carried out in this area are intended to increase customer satisfaction, studying the perceptions and expectations of employers in project-based organizations for the proper use of the criteria in projects is of high importance and can lead to improved performance in the organization.

As a dynamic business area, always there is a balance between the current and desired status of project-based organizations. In addition, there is no exact definition for desired status. Therefore, studying perception and expectation of contractors and employers is playing a main role for agile project management analysis.

The present research is carried out to identify effective criteria in project management agility and prioritize the criteria using Data Envelopment Analysis.

After clarifying the purpose of the study, the results of the data obtained from 6 projects in Foolad Technique Company were analyzed. The weak points in criteria of project management agility in each of these projects were pointed out and based on the findings of the research some suggestions were made. Based on the studies carried out on project management agility, all effective criteria were divided into 10 main categories and 37 sub-categories. Because of variable return to scale, DEA model was resolved by BCC input- and output- oriented method and ranking of effective factors on agility was achieved. As in this model lower perceptions and higher expectation of one criterion leads to an efficient DMU, the following results were obtained from the studied carried out: considering the employer's and contractor's perceptions, and the contractor's perceptions of the employer's perceptions as the input, and employer's and contractor's expectations as the output and criteria of project management agility as DMUs, the results showed that the following criteria are in critical condition in Foolad Technique Company: "management commitment", "organizational environment", "team capabilities", " Customer Involvement", " Project Definition Process", " Delivery Strategy", and " Project Schedule". In other

words, by keeping the input / output levels constant, these factors gain the highest expectations /lowest perceptions. Among these criteria, paying attention to "team capability", “Customer Involvement ",” Delivery Strategy “and "organizational environment" is more important, as they can be enhanced by their sub-criteria. Contractor’s perceptions of the employer's expectations has the highest impact on ranking the criteria of organizational agility by DEA in Foolad Technique Company.

In the proposed DEA model, employers’ and contractors’ perceptions and expectations are of the same value in Foolad Technique Company and are analyzed in comparison with each other. Easily collected data as well as the ability to solve the model because of infinite DMUs are other advantages of this model.

As no project-driven organizations were found which operated in non-software industry and lunched their projects based on the principles and values of project management agility, the present research was carried out in project-based organization which were run in traditional methods. Also, due to the involvement of employers in this study, we were only permitted to distribute our questionnaires for six projects. To measure project management agility definitive data was used in this study. The results obtained from the study are solely based on information obtained from employer’s perceptions and expectations, contractor’s perceptions and expectations and the contractor’s perceptions of the employer’s expectations.

In order to achieve better results, it is suggested that the proposed method is carried out in an agile project-driven organization. Also to present an overview of the overall status of Foolad Technique Company in the criteria of agile project management, it is recommended that the proposed method is carried out in all its projects. Due to uncertainties in the data, using phase spectrum in analyzing the data is recommended. As it may be possible that there are other perceptions and expectations contributing to project management agility, analyzing the results using them is recommended. Finally according to DEA, when the number of DMUs is greater than the number of input and output, better results can be achieved. Therefore, it is suggested that the proposed model is solved by considering 37 sub-criteria.

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