Available online at www.CivileJournal.org

Civil Engineering Journal

Vol. 4, No. 11, November, 2018

New Rethinking on Managers' Competency Criteria and Success Factors in Airport Construction Projects

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Received 29 March 2018; Accepted 27 September 2018

Abstract

The present research was conducted with the aim of rethinking the criteria competency of airport construction project managers. The research methodology was applied in terms of purpose, and a combination of descriptive survey methods and content analysis in terms of implementation. The statistical population consisted of 550 experienced managers of construction industry in public and private sectors, including contractors, consulting engineers and their employers in Iran in the late decade to 2017. The sample size was 230 according to Morgan sampling table. The subjects were collected by stratified purposeful sampling method. The data gathering tools were the managers' desirability questionnaire with a reliability coefficient of 0.916, a project success rate with a reliability coefficient of 0.863 and an interview with the managers with an agreement coefficient of 0.899. The data were analyzed by SPSS and TOPSIS software using descriptive statistics of frequency, percentage, mean, standard deviation, and inferential statistics of exploitation, Factor analysis, Kolmogorov-Smirnov Test, and one-way ANOVA. The results of the research indicated that the airport construction is of great importance due to the necessity of developing the infrastructure and the territorial location. The criteria of competencies for managers in the airport construction industry are different from the past and attention to local and environmental criteria is among the recognized management criteria. The priority of localized thirteen competencies of the project managers was leadership, project financing, project cost management, problem solving, project governance, time management, strategic management, quality management, controlling and integrated management, managing legislation and regulations, networking and professional ethics. Moreover, the local factors of the project success in priority order were timely allocation of funds, appropriate financial support, integration, upstream project management, appropriate financing of financial needs, management integration, strategic stability, stakeholder commitment and accountability, review cost mismatch, completion of the project in due time, increase of knowledge level in the organization.

Keywords: Airport Construction Industry; Manager Competencies; Project Success; Localized Model.

1. Introduction

The infrastructure readiness of a country is one of the most important criteria in achieving sustainable development, among which the successful implementation of airport construction industry is of leading, effective and vital challenges faced by the airport project managers and administrators [1]. Investors and governmental financers of these projects have always had difficulties in identifying and employing qualified executives succeeded in the success of such large-scale major projects [2].

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http://dx.doi.org/10.28991/cej-03091192

The criteria of competencies for managers and the project success factors have been decisive in operating and completing the airport construction projects. Since the airport construction is the forehead and the symbol of development in each country, so this project management has always been challenging in the design, construction, operation, development and maintenance of periods [3]. The same concerns and doubts have caused planners and investors to have a thorough vision based on past experiences and the need for advancements in the use of appropriate managers of implementing the airport construction industry [4].

In the airport construction industry, it is very important to consider strategic management, so that further attention is paid to maximize the stakeholder expectations and the project objectives with a comprehensive look at the internal and external factors of the project. For this reason, local talent is considered as one of the internal factors [5]. In particular, the airport construction in a long-term perspective in line with sustainable development should be profitable with inclusive value added. Accordingly, the local parameters play an active role in the formation of such projects, operation and management of their various stages. Socio-cultural parameters are crucial for applying the native managers and the criteria of competencies for managers are geared toward exploiting the competencies of social psychologists [6]. In accordance with competence method, which is a reference and standard for determining the criteria of competencies for managers, the environmental and native competencies have been influenced by the human community, and the managers' behavioral competencies have been affected by managerial human features [7]. This demonstrates vital importance of the socio-environmental context of managers; therefore, attitudes, values and management culture are significant in the project success. Hence, the managers often focus on the merits of their social environment and local native texture [8].

2. Research Backgrounds

The success factors in the management of development projects are almost well-known, but their function varies in public and private projects. This difference in macro projects will increase. Focusing on these differences is essential in project success and in meeting the expectations of its users [9]. A study investigated also the management competencies in a state projects, and the findings showed that the most important competences in three knowledge, skill and behavioral clusters were classified as well-known standard operating strategies. Therefore, it is necessary to analyze the managers' eligibility gap and develop their suitability [10].

Various criteria have been identified in the standardization of the criteria of competencies for managers and success factors of the construction industry, but 25 project success factors have been priorities, the most important of which include planning, cost management, quality management and time management. These factors have been decisive even in critical situations [11]. According to a qualitative research, some of the criteria have a general aspect in defining the competencies of management. At the same time, new technological criteria cannot be ignored. Further, engineering of environmental components is a necessity of the integrated management system in the project. As the scope of the project increases, the economic and social competencies of management also change [12].

This finding suggests that the localization of management competence criteria and project success factors is crucial, especially in the construction industry, where large projects are on the agenda, will be decisive. If the competencies of managers are not designed based on social conditions and values and the characteristics of the community, they will be unable to achieve a desirable and consistent long-term vision. Sustained development projects have been introduced critical in stimulating social change in a study designing a leadership competency model for managers of sustainable construction projects. Therefore, the project managers' eligibility criteria should also be influenced by social environmental factors and, in principle, the construction projects manifest in the context of the environmental ecosystem and develop accordingly [13].

Recent experiences in large-scale development projects showed a strong relationship between project success and project management competencies. This experience compared the ten industrialized countries, and the findings revealed that standardization, management competencies and senior management competency were fundamental for the successful completion of major macroeconomic projects [14].

Various applications are involved in the establishment of large construction projects, so that the management and human resources of the project should benefit from factors such as human resource management, communication, technical features, monitoring, and control and appropriate feedback. Technical and tactical plans even should be provided for the types of project uses [15]. Investors involved in large-scale development projects have expectations. The project management cannot be indifferent to the project success factors. The project success factors should be addressed even in the reengineering of the economic environment. This approach is effective in meeting stakeholder expectations [16].

The physical infrastructure and its applications play a vital role in developing countries, which is why technical competencies of project managers are decisive. Selection of contractors and project managers is based on the highest standard method and powerful management metrics that are capable of meeting the expectations and successful implementation of projects [17]. In this way, the competition for the airport construction projects has intensified and is more sensitive than before. It is the same sensitivity that has added native features [18].

In a study, the factors affecting the success of development projects are divided into two external and internal classes. Most articles frequently highlighted ten external factors and nineteen internal factors that can ensure the project success, even in critical situations [19].

In the previous researches, the main the project success factors and the criteria of project managers' competency were studied separately, but this study explored the impact of project management leadership competence criteria on the main project success factors. Additionally, the project success factors and project manager's eligibility criteria were localized according to the environmental and local conditions and the model was validated. These features distinguished the present research from others due to an innovative approach. In addition, the industry in this research was considered to be an airport construction that was rarely addressed in previous research.

Considering the importance and impact of the standardized criteria, the competence of management and the contributing factors to the project success in the airport construction industry, this study sought to identify these criteria and factors and the economic status of the airport in sustainable development. In this regard, three research questions were arranged to be responded by relying on field analysis.

3. Research Method

This research methodology was applied in terms of purpose, and a combination of descriptive survey methods and content analysis in terms of implementation. The statistical population consisted of 550 senior executives of contractors, consultants and employers in the airfield industry, operating in two sectors of governmental and contractual managers. These people worked in Iran in the late decade to 2017 and were experienced in establishing overseas airports such as Dubai. The sample size was 230 according to Morgan sampling table. In addition, for conducting an exclusive interview on the indigenization of competencies criteria, 28 individuals from the samples participated in the process of conducting interviews. The subjects were collected by stratified purposeful sampling method. Since the managers worked in the top four departments of the airport and mid-airport managers, at first, the share of each class was allocated to the sample size, and then the selection of individuals was targeted in pursuit of saturation. Concerning the interview, among the sample individuals, those who had the most experience in the airport construction industry were involved in reaching the saturation level. Data gathering tools in this research were a descriptive questionnaire for managers, a project success rate questionnaire, and managers' competency localization interview. Validity and reliability of each questionnaire were initiated at the baseline on the basis of consensus with experienced experts, standardized questionnaires, consultation sessions, statistical process, Cronbach's test and acquisition of reliable coefficients. Scientifically, the reliability coefficient for the managers' competence questionnaire was obtained as Table 1.

Table 1. Characteristics and reliability coefficients of managers' competencies desirability questionnaire

No.	Competency scales	Number of items in questionnaires	Range of Scales	Cronbach's reliability coefficients	Number of items
1	Environmental Competency	1-10	10-50	0.903	10
2	Technical Competency	11-21	11--55	0.844	11
3	Behavioral competency	22-36	15-75	0.928	15
	Total	1-36	36-180	0.916	36

Moreover, the process of achieving validity and reliability in the project success rate questionnaire is reflected in Table 2. Meanwhile, this statistical process was performed by SPSS software.

Table 2. Characteristics and reliability coefficients of project success rate questionnaire

No.	Scales	Rows of items in questionnaire	Range of Scales	Reliability coefficient	Number of items
1	Financial issues	1-5	5-25	0.850	5
2	Appropriate allocation	6-9	6-30	0.870	4
3	Financing	10-13	10-50	0.763	4
4	project scope	14-17	14-70	0.805	4
5	Productivity Risks	18-21	18-90	0.730	4
6	Cooperation structure	22-26	22-110	0.772	5
7	Political clarity	27-32	27-135	0.751	6
8	Economic sustainability	33-38	33-165	0.726	6
	Total	1-38	38-190	0.863	38

3.1. Implementation Method and Interview Analysis

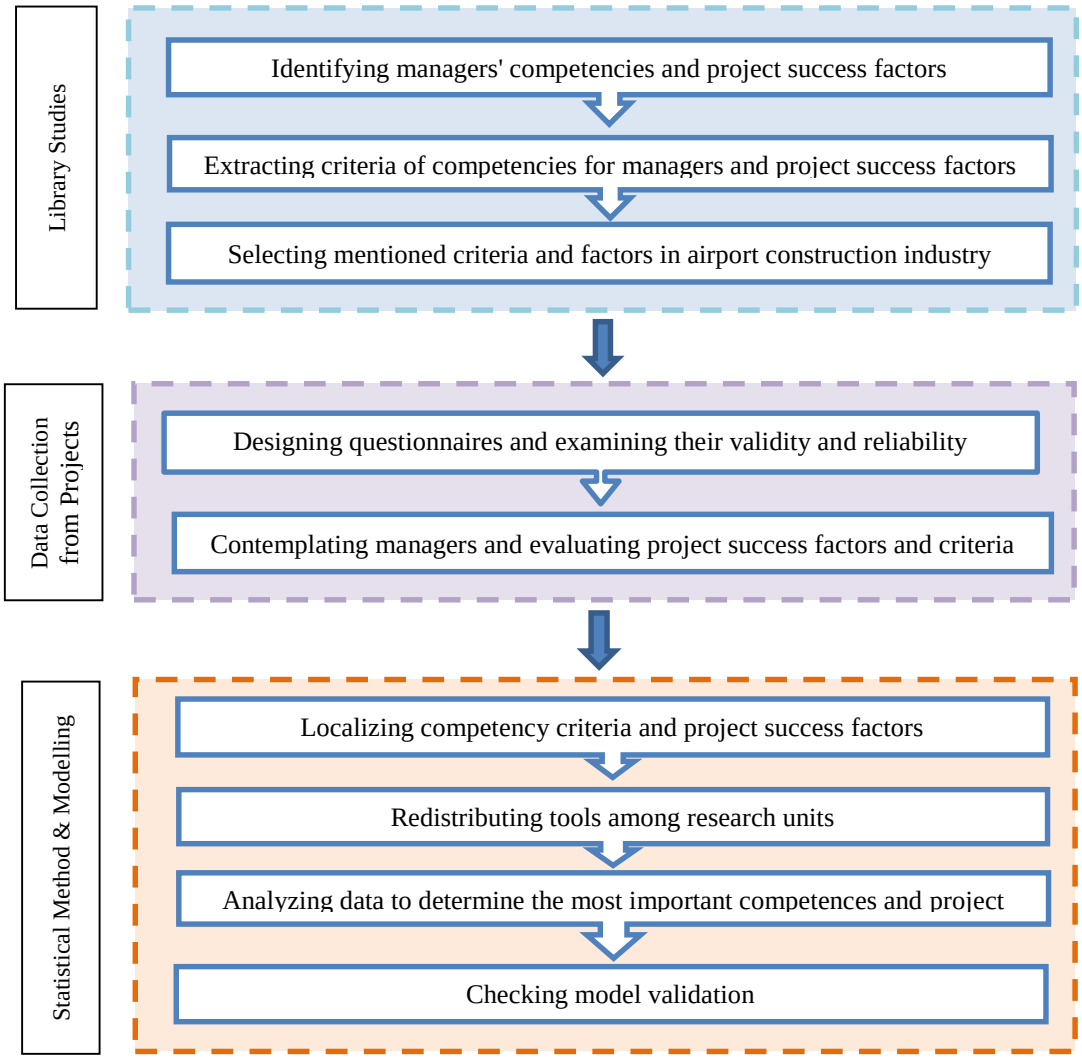
In conducting interviews with the experts of the airport construction industry, efforts were made to ask questions about the impact of socio-environmental parameters on the determination of the merit criteria of managers from their valuable experiences. The semi-structured dialogue provided information that led to the emergence of findings at the stages of analysis and processing, reported in the research results. Content analysis method was used to analyze data of interviews. The agreement rate in the interview format was 0.899.

3.2. Statistical Methods

Due to the quantitative data obtained from the questionnaires, descriptive statistics were used to analyze using SPSS software, including mean, standard deviation and variance. Kolmogorov–Smirnov test, skewness and kurtosis were used to ensure the data were normal. One-way ANOVA was applied to provide internal validity of the data. The TOPSIS software was employed in the localization process of the management and project success models. This software is able to compare indices and identify their priorities by weighting each indicator.

4. Research Process Steps

This study was organized in a six-step process. In the first step, theoretical studies were conducted to achieve the background and literature of the research. At this stage, the achievement of the criteria of competencies for managers and the project success factors were provided. In the second stage, the design of questionnaires and related interviews were carried out and there were necessary concurrence with the experts. In the third step, the tools were distributed among the research units and then the field information was gathered. In the fourth step, while collecting the completed tools, the content analysis was carried out to analyze the content of the interviews so that the results of the localization of the criteria and other statements of the interviewees were extracted and their significance in the airport industry was revealed. In the fifth step, the analysis and design of the models were considered. Next, the model of the managers' competence, the model of the project success factors and the localization model were followed. In the sixth step, the research results were extracted and categorized according to the requirements of the research questions and further applied proposals were presented.



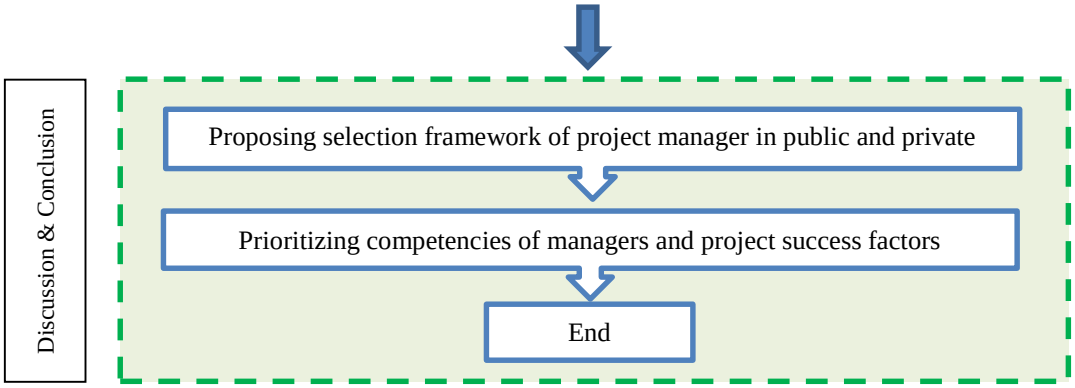


Figure 1. The Flowchart of Research's Process Steps

5. Results

In this study, the qualitative interviews were held in which stakeholders and activists in the field of airport construction projects revealed new dimensions of localization requirements and criteria for managerial competence and project success factors. The findings of this interview are reflected in Table 3.

Table 3. Localized parameters effective in airport industry projects

No	Answers of interviewees about the localized parameters in the airport construction industry	Frequency	Percentage
1	Today, in the airport construction industry, airport cities are designed to experience employees, airport business activists, passengers and clients during their hours of presence at the airport, enjoying a memorable and satisfying life.	20	77
2	The core of the space and the functioning of the city airport is its passenger terminal, which is a multimodal commercial communications operator, and airport construction project managers should pay attention to these local and international applications.	19	73
3	New patterns of airport construction projects are different from the past. In these patterns, attention is paid to the unmet needs of passengers, the services of passengers and passengers, the transportation of passengers and cargo. Also, the availability of infrastructure is very important.	17	65.3
4	The airport aviation business has become an economic airport city and the management of these projects, both at construction time and at the time of exploitation is decisive.	17	65.3
5	Local capabilities and the ability to build and maintain airport projects in sustainable development of countries are highly effective in creating value-added roles.	16	61.5
6	The successful experiences of airport development projects in Hong Kong, Singapore, Dubai, Frankfurt, Dallas Fort Worth, and the Chinese capital during the 2010s showed that the economic impact of airports has been far greater than its educational success.	15	57.7
7	The Incheon airport in South Korea and the Dubai airport in 2008 earned $ 1 billion annually only through retail outlets, which was very successful due to the recession in that year. This is the same as utilizing the native capabilities and successful management of the airport.	15	57.7
8	The participation of private and public sectors in the construction, maintenance, operation and development of airport settlements, including airport contracts, etc., in addition to profitability, adds value and added value.	14	53.8
9	Native executives' managers should take every step to believe in the positive attitude of exploiting local, regional and international capabilities to succeed in providing their own interests, national interests and real and legal investors.	14	53.8
10	Competition in airport cities is unpopular with the creation of new sources of revenue; the forecasting of infrastructure for these businesses requires a long-term managerial perspective.	13	50
11	As urban development is not limited to the political boundaries of central cities, the development of airports is not limited to the official airports, and therefore the management of the construction, maintenance, operation and development of airports has been transformed.	13	50
12	Competition in airport cities is unpopular with the creation of new sources of revenue; the forecasting of infrastructure for these businesses requires a long-term management perspective.	13	50
13	Experience has shown that the increase in employment near airports has been faster than the suburbs, and this is the same as considering native capabilities.	12	46
14	Native parameters in the management, social, and cultural domains have played a decisive role in the phases before, during and after the airport construction.	12	46

n = 46

Since the airport of each country is a very important symbol of its sustainable development, in this regard, even in the design and construction of airports that are targeted and managed by multinational corporations, the national interests of the country are emphasized by local uses and the sustainability of local interests. For this reason, in the preliminary plan, a map of airport construction industry is drawn up for a long-term perspective, and the management of design, construction, operation, maintenance and development is tailored to the time and place of economic, social, political and cultural conditions. Interviewees who were themselves stakeholders in the construction industry projects in Iran, Dubai and the Netherlands, revealed new dimensions of management needs in the airport construction industry, which are very important parameters in this field. Today, the concept of the airport goes beyond a transit range, which exceeds its economic meaning. They are not in the official area of the airport, but internationally, if these uses are inconsistent with the local, native and national airports, its economic prosperity will be reduced. The more native management works, the greater the cost of native benefits from the airport. Otherwise, the interests and profitability of the company will be shared with other non-domestic investors. This is why the managerial competencies and project success factors in the airport construction industry relate to its native parameters prior to its academic and specialized parameters. These are the localized parameters that play a role in determining the priorities of the academic criteria of management competency and project success factors.

In the earned results, more than seventy percent of experienced airport engineers were acknowledged, and the airport commercial economic applications were vital, and the new airport construction projects need to respond to unexpected passengers. Aviation business at the airport, especially at the retail level, has huge revenues and has a significant impact on creating value added. The successful experiences of building and developing new airports internationally have been certified as economic approvals. The participation of public and private sectors, exploiting local capacities, paying attention to ecosystem issues and even assigning native managers to the construction and operation of airport projects has been very influential.

5.1. Identifying the Model of Important Project Success Factors

Statistics were obtained in order to localize the project success rate in the airport construction industry, and then the six stages of TOPSIS software were exploited. Since the directors involved in this research were in four senior airport teams (including consultants and employers), senior contractors, mid-airport and mid-level contractors, it was possible to compare the couple's views on the success of the airport construction industry project. The statistics showed that the groups of managers agreed to identify the varied factors of the project success. Each of the 38 factors has its own weight. Meanwhile, ten of the highest grossing weights are the project success factors:

1- Assignment of timely financial resources. 2- Existence of appropriate financial support. 3- Integration of upstream projects with project management; 4- Suitability of financial needs; 5- Integration of management; 6- Stability of management strategy; 7- Commitment and accountability of stakeholders; 8- Investigation of cost inconsistencies in financial affairs, 9- Completion of project at due time, 10- Elevation of knowledge level in the organization (Table 5).

Table 5. Weight and prioritization of model of Project success factors

No.	Factors	Weight of criteria	Rating
1	Assignment of timely financial resources	1.000	6
2	Existence of appropriate financial support	0.862	9
3	Integration of upstream projects with project management	0.850	29
4	Suitability of financial needs	0.789	7
5	Integration of management	0.784	22
6	Stability of management strategy	0.780	32
7	Commitment and accountability of stakeholders	0.772	27
8	Investigation of cost inconsistencies in financial affairs	0.758	1
9	Completion of project at due time	0.743	20
10	Elevation of knowledge level in the organization	0.706	21

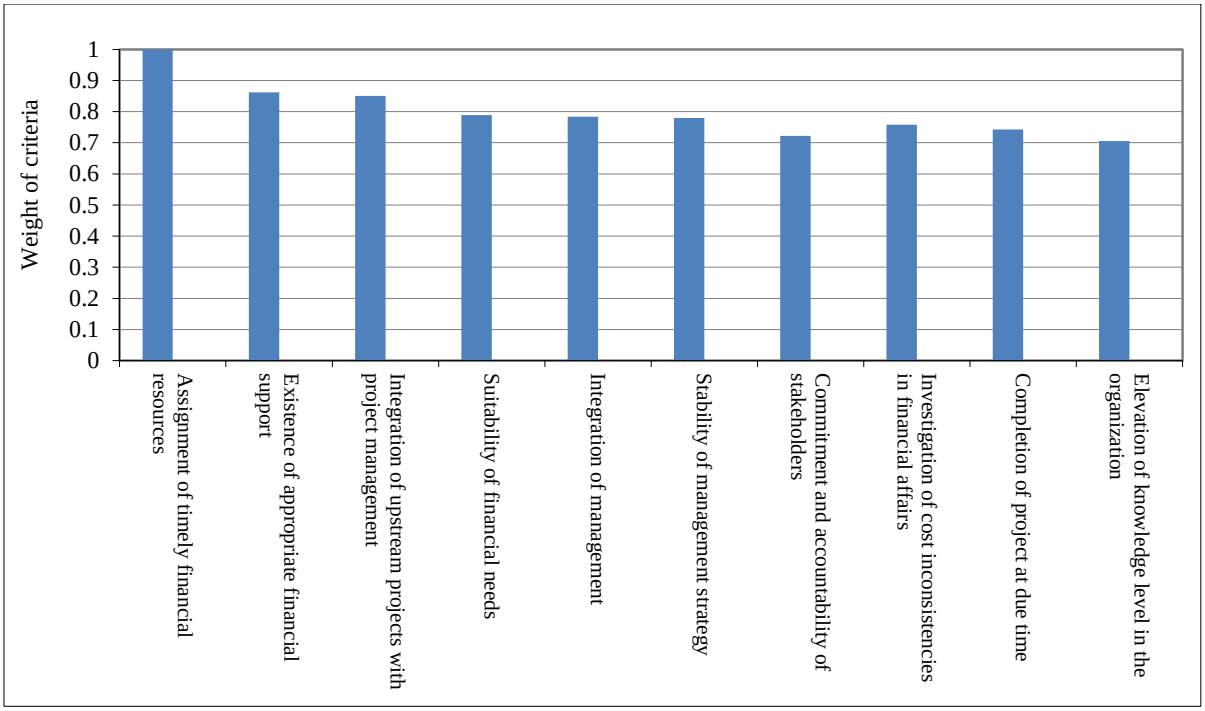


Figure 2. The project success factors in airport construction industry

5.2. Identify the Model of Managers' Competencies

Statistics were obtained in order to localize the managers' desirability model in the airport construction industry, and the software was developed to cover up to six stages. Since the managers involved in the study consisted of four senior airport teams, senior contractors, mid-airport and mid-level contractors, it was possible to compare their views on the suitability of the airport construction industry managers. These statistics showed that the managers' groups were in agreement with the managers in identifying the root causes of the competency of the managers, and the components of the 36 models of the designed model were of a proportional weight. Meanwhile, the thirteen highest weights of the basic criteria of managerial competencies in the construction industry were as follows:

1- Leadership competency, 2- Project finance management, 3- Project cost management, 4- Problem solving competence and decision making, 5- Project management governance, 6- Time management, 7- Strategic project management, 8- Project quality management, 9- Self-management competence, 10- Integrated project management, 11- Laws and regulations, 12- Competency of networking and teamwork, 13- Professional ethics competency (Table 6).

Table 6. Weight and prioritization of standardized models of managerial competencies

No.	Criteria	Weight of criteria	Rating
1	Leadership competency	0.897	29
2	Project finance management	0.877	3
3	Project cost management	0.874	14
4	Problem solving competency and decision making	0.856	28
5	Project management governance	0.832	1
6	Time management	0.762	13
7	Strategic project management	0.723	2
8	Project quality management	0.705	15
9	Self-management competency	0.701	30
10	Integrated project management	0.675	11
11	Laws and regulations	0.656	10
12	Competency of networking and teamwork	0.637	26
13	Professional ethics competency	0.625	22

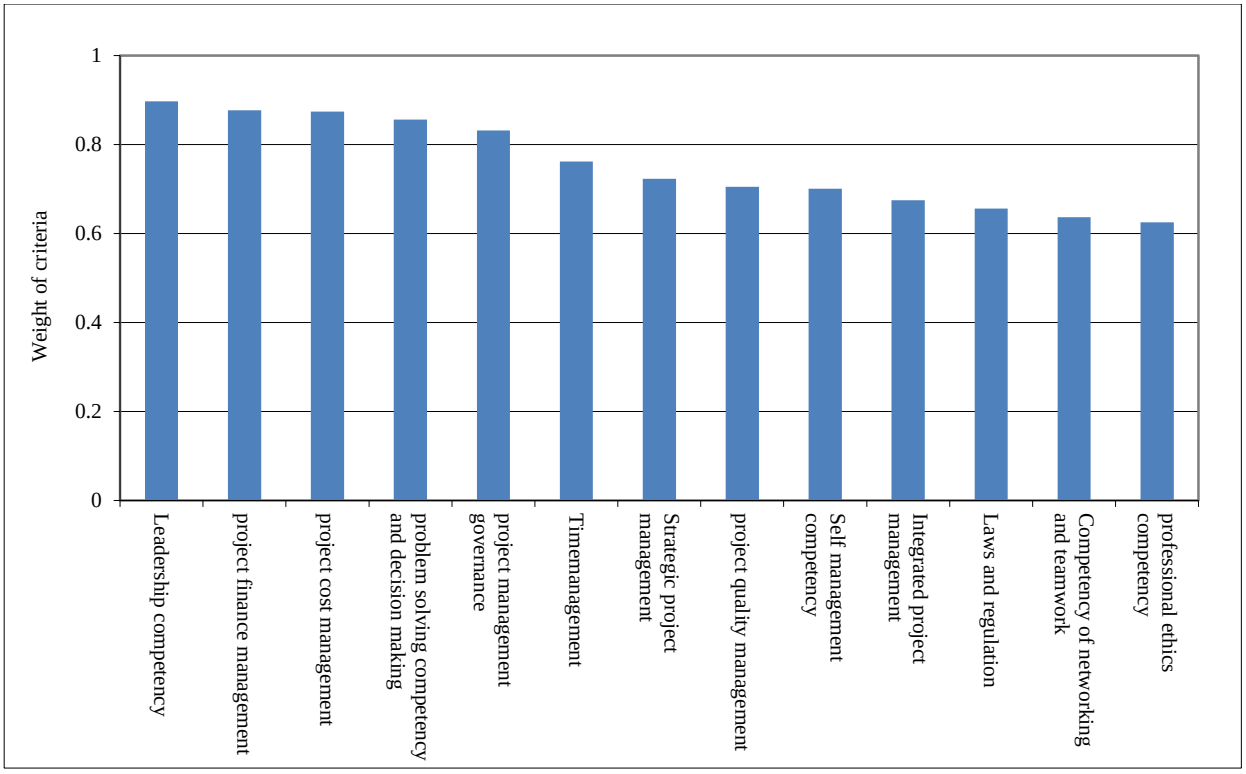


Figure 3. The criteria and prioritize of abstract model of competency

6. Discussion

The airport construction projects are of great investment with very diverse purposes. The construction of such projects requires compliance with existing standards, local, national, economic and social characteristics. In principle, governmental agencies have a local look at such projects. The managers of these projects should pay attention to local standards in order to meet the expectations of employers, investors and stakeholders. That is why, in the upstream documents, long-term horizons have been defined for native social values managers. In this research, we tried to consider these points, the criteria of the suitability of the managers of the airport construction projects, as well as the factors affecting the success of these projects, with the emphasis on local characteristics. Comparison of the findings with the available literature showed that the eight project success factors were the most frequent in other studies [6, 10, 14, 18, 20 and 21]. Additionally, in the thirteen competencies of project management, an important part of them in other research has been identified as the key factors [5, 9, 14, 16-19]. In this way, it can be said that what has been identified as criteria for the suitability of managing airport construction projects as well as success factors in the project, on the one hand, is adapted to national characteristics and, on the other hand, has been coordinated with international standards and researches. What constitutes an iron triangle in project success stories and emphasizes three factors of cost, quality, and time is consistent with the findings of this research. From the social point of view, these factors are consistent with the cultural context of the ecosystem, so as to improve the localized use of airport projects. Therefore, this research, both theoretically and practically, meets the existing knowledge and diversity of user needs for airport projects

The interviewees provided valuable feedback to activists regarding the airport construction projects, including the airport economic concept of transit. The airport managers should pay attention to diverse local income applications. In new patterns of building an airport to meet the unmet needs of travelers, business-related aviation economic affairs of the city affects the country; the local capabilities play an important role in the construction and maintenance of aerodromes. The integrated management of government and legal sectors in the sustainable development of the airport is very important. The airport construction has a decisive role in creating employment and development; retail revenue in new airports in the last decade has shown a profound profitability. Localized parameters in the social, economic, and cultural management areas have been decisive in the phases before, during and after the construction of the airport. Due to the results and the importance and economic role of the airport construction projects and the need to pay attention to the localized parameters here, the applied research proposals are presented as follows:

- In order to maximize the effectiveness of localized parameters in managing airport construction, it is recommended to provide integrated management in this industry.

- Providing stakeholder expectations for airport projects through project management, in addition to meeting their maximum participation in sustainable development, will also play a key role in the development of environmental ecosystems.
- Attention to professional ethics by managers and their diffusion in the airport organization as a national and international standard for attracting investment, sales in business and airport tourism.
- The importance of managers to knowledge and understand national and international issues will have a positive impact on leadership in the organization and success in the operation of the iron triangle. Therefore, managers will be instrumental in equipping themselves with these issues.
- Utilizing the latest competitive behavior in the airport construction industry will enable the implementation of distinct services and will determine the development of the airport, so the managers should pay attention to these behaviors and their observation.
- Adherence to the standards of project success with ecological, environmental and national characteristics will have a positive effect on the diversification of airport functions in providing competitive and creating value added; therefore, it is suggested that these features be fully utilized.
- The management competencies in the airport construction industry can be effective in advancing the project success, which will appear in mapping the long-term airport prospects in the economic, social and developmental arenas, so it is suggested that project managers pay special attention to this.
- The localized criteria for management competence and the project success factors have been identified as an effective priority in the success of the airport projects. The managers are encouraged to gradually integrate other standardized project management and project success styles with the inclusion of localized criteria and factors.

In the research background, standardization of management criteria has been considered based on project environments, later considered as the cornerstones of the corporate ingenuity triangle [7]. Principally, in governmental agencies, local look at construction projects overlaps with other perspectives, and therefore the management of native criteria meets the expectations of employers. Upper administrative documents in Iran also emphasize the progress of localization and long-term horizons of native competencies and social values in management [12].

In the findings of a study in determining the project success factors, it was observed that it is very important to consider economic, social, environmental and normal conditions of the project, which plays an active role in the application of the project with local and national characteristics [20]. The model of work culture as a social and local parameter is one of leading factors in the project success, which is effective at the macro, minor, technical and social levels [21].

7. Conclusion

In order to identify the model of competency management criteria in the airport industry, thirteen criteria have been detected in Iran for identifying localized criteria, including 1- leadership competency. 2- Project finance management. 3- project cost management, 4- competency problem solving and decision-making, 5- governance management and project leadership, 6- project time management, 7- project management, 8- project quality management, 9- competency of collaboration management, 10- integrated management, 11- management of laws and regulations, 12- competency of networking and teamwork, 13- professional ethics qualification. The weight of the criteria was obtained from the coefficient from 0.897 to 0.625, indicating their importance.

In order to identify the project success factors, data analysis using the TOPSIS software distinguished ten of them among the existing agents in Iran, including 1- provide timely financial resources. 2- Adequate financial support. 3- integration with project management, 4- eligible payment requirements, 5- integration of management, 6- stability of management strategy, 7- commitment and accountability of stakeholders, 8- investigating expenditure inconsistencies in financial affairs, 9- completing at due time, and 10- increasing the level of knowledge in the organization.

8. Acknowledgements

It is worthy to thank all the managers of Iranian airport construction projects, including public and private sector managers, consulting engineers and contractors who contributed to the implementation of the current research by presenting their comments.

9. Conflict of Interest

The authors declare no conflict of interest.

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