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Identifying Success Factors of Healthcare Facility Construction Projects in Iran

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Abstract

Building of healthcare facilities are considered to be complex owing to uncertainty attached to the nature of these types of projects. Feasibility study through design and construction figured out that many intricate factors should be considered by project managers to make healthcare projects successful. Multiple building components and systems, diverse stakeholders' needs, progressive healthcare technology, specialized functions, different financing methods, and particular building codes and regulation make managing of healthcare facility construction a challenging tasks for project managers. Therefore, understanding the criteria for successful delivery of these types of projects is critical for project managers. Although, evaluating success factors of general construction projects has attracted attentions in recent years, no research has addressed specific nature of healthcare construction projects. This paper aims to identify success factors of healthcare facility projects by interviewing practitioners who have substantial experience in construction of health care facilities in Iran. The qualitative nature of the study gives an opportunity to experts to reveal their insights about projects success factors through open-ended interviews. The result can be used by project managers as a guideline to handle healthcare construction projects successfully

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1. Introduction

Construction industry has an important impact on safety, health, environment and society [20]. Success of construction projects have direct effect on mentioned parameters. Hence, attention be paid to factors that may

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endanger the project success [2]. One of the problems, in project management, is unawareness of success factors which lead to its failure. All projects have been developed for specific purposes so they could be called successful if they are completed in the scheduled time, as well as in accordance with the planned cost and quality. So, there is a need to clearly define success factors in construction projects. After defining these factors, the success rate of projects can be measured. The construction industry has a major role in Iranian economy by generating employment and wealth [2]. No research was conducted in Iran regarding project success factors. While initially project success is measured based on pre-determined factors, these factors could be different during the size and function of projects. Therefore, knowing these factors is the first step in measuring project's success. The purpose of this research is to distinguish success factors of healthcare construction projects in Iran. This article tries to find main reasons of success through interviews with managers and civil engineers with at least 15 years of experience in contracting, consulting and employing companies and assessing them.

2. Literature Review

Several researches have been carried out about success of construction projects in different countries specifically in Europe and Eastern Asia. The study on the success factors of construction projects was first done by Rockart in 1982 [15], on the elements which make the real difference between success and failure. Defining success factors of a project is based on it reaching its goals which should be provided for the participants. [18] and [7]. In any project "success" can be announced when it is completed according to the schedule, pre-planned budget and needs of stockholders. Project's proper function, profitability for contractors and arising no claims are factors of project success. [3] Which can be divided into two groups: hard, tangible and measurable objectives and soft mental and spiritual and less measurable ones. Time, cost and quality criteria are widely known as the triangle of project management, while safety, environmental health and technical factors are also improving. Client satisfaction, proper communication among the elements of project and absence of dispute are factors that can guarantee a project success. [5]; [9]; [10]. In academic literature client satisfaction is a variable in project success during last decades in and by the time of completing the project evaluating client satisfaction and project success are very close to each other [2]. A number of researchers have investigated project success factors. Among them, Madhooshi (1994) can be mentioned, which analyzed the success and failure factors of construction projects and presented a model for predicting success. Although this model has considerably helped to analyze factors of success, the development of single model for all construction projects is not valid because of differences in size, nature and level of complexity of project the complication of these projects. For instance, the success factors for road projects are different with the success factors for medical projects that are of the most complex projects and mostly several part contractors are working at the same time needing a more accurate investigation of success factors. Then, Shokouhinia (2010) recognized and evaluated the factors influencing success of oil, gas and petrochemical contractors. He studied the projects of Aria-Petro-Gas Company and presented a model for the success of such types of projects. Piran (2012) evaluated and predicted project success by using the indexes of business environment and development model. He determined the importance of the key factors influencing project success by identifying them. Despite of the valuable research, it should be noted that the accurate identification of success factors depends on deep analysis and investigation of the projects, the use of expert's opinions and reviewing the literature and it is impossible to dominance these factors only by studying journals and dividing the factors into two groups of internal and external factors. In this direction, Abolhasani (2012) studied South Pars (the largest gas project in Iran) and evaluated the different key factors of the success of project management by using group decision-making technique. That research was also focused on oil and gas sector. The identification and evaluation of the key success factors in the project-based organizations was performed by Dalirpour (2012). Regarding the importance of the performance and the position of these organizations in the country and their need to improve and progress, the research was focused on the project-based organizations and not the projects in that research. In a different attempt, Minaie (2013) placed on the agenda the identification and prioritization of the key success factors of mass buildings construction. In such types of projects, there are many similar and standardized activities, however, less similar activities exist in the medical projects and each part has its special standard. As it can be seen, the identification and prioritization of the success factors of medical projects is not studied specifically, and doing such a research is necessary more than ever.

3. Research Methodology

At the beginning where the existing literature on success factors in projects was studied, the focus was particularly on the resources that identify success factors of health projects in different countries. Review of literature helped this research to recognize factors of project success in other countries. To focus deeply on the subject and identify its hidden angles of this research, qualitative method has been used. This helps the target of this research which is to recognize success factors in healthcare projects. In order to focus on experiences of experts, interviewing has been chosen as the main data collection method. To identify success factors in Iran, 20 interviews have been conducted with experts involved in the construction industry of Iran with at least 15 years of experience. All of the interviewees have the experience in constructing healthcare projects and they have been chosen by Snow ball sampling method. The demographics of the interviewees are shown in Appendix 1. Interviews have been conducted in open ended manner so the interviewees feel at ease explaining their points of views. Then the interviews were transcribed. Gathered information regarding the subject is based on valuable experts' experiences. Qualitative analysis was done by coding method. In this method the researcher recognizes the theme by reading the interviews transcription. Gathered information is categorized in this fashion and each group has been integrated which would be discussed in data analysis part.

4. Qualitative Data Analysis

According to the gathered information, success factors in healthcare projects are divided into eight groups which are explained below (fig 1). It worth mentioning, this information is context dependent and cannot be generalized to wider settings.



Fig 1. Identified Success Factors

4.1. Scope

Scope includes the processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully. Plan Scope is the process of creating a scope management plan that documents how the project scope will be defined, validated, and controlled. The key benefit of this process is that it provides guidance and direction on how the scope will be managed throughout the project (Project Management Institute (PMI), 2013). All project managers use project scope management throughout the project life cycle to identify and control all aspects involved in a project without a planned scope so practical deliverables are not

possible. That is the importance of Scope in Project Management. Based on gathered information, scope management project in healthcare construction projects could be evaluated under two categories of pre-construction studies and feasibility studies. According to O1 one of the biggest owners' problems is not knowing the scopes of projects. Weak pre-construction studies of consulting companies are due to not knowing the details of projects and it has happened many times that there has been no concordance between the culture, climate and the assigned land. C1, C2 and C3 are all expert managers who are aware of the importance of the early studies and they believe that it is one of the reasons of project failure. They all believe that project X (for privacy reasons the real names of the projects are changed) is an obvious example.

4.2. Time

Time includes the processes required to manage the timely completion of the project and is one of the most important factors in healthcare projects [9]. Planning, scheduling, political reasons and lengthening of correspondences are four groups of factors that challenges time. N2 believes that project completion is only doable when it is done according to the schedule but N3, N5 and O5 deem precise planning more important than scheduling which is less important. N1 implicitly confirms the above mentioned but believes that accurate determination of priorities and implementation of enforcement activities in more detailed and fragmentary in order to specify prerequisite for any activity are important factors to reach an accurate schedule. But all of the interviewees believe completion of projects in recent years has always been increasing and usually projects face delays. O3, a manager with more than 35 years, emphasizes political reasons increase the time of healthcare project completion and sometimes even suspend them. O6 and C7 mentioned decrease in profitability of projects as the impact of delay in project completion. C6 and C5 mentioned converting old office system to automation to decrease time of correspondences. Although it doesn't seem helping to the reasons of project success, in fact any requests by construction agents are under impact of corresponding time. Table 1. An example of a table.

4.3. Cost

Cost includes the processes involved in planning, estimating, budgeting, financing, funding, managing, and controlling costs so that the project can be completed within the approved budget [14]. Based on gathered information, adding to the above mentioned factors, value engineering is also a parameter in project success. Most of interviewees believe that cost is the most important factor in project success (O4, O8, N3, C7, C2 and C4). O3, with high management and administrative experience in healthcare, projects believe injecting credit to projects is one of the most effective factors in project success. O2 believes the opposite and emphasizes that credit injection without control over the cost not only does not lead to project success but also is one of the factors that challenge it. C5 and C6 approve O2's idea and believe that low but controlled fund has better impact on project success than high and uncontrolled one. C4 mentioned project Y which was completed by value engineering which is an efficient parameter to reach success in projects. O7 confirmed C4's opinion, commenting that using value engineering is not possible in all projects and a deeper look should be taken at the funding but he did not mention a method to replace value engineering.

4.4. Quality

Quality includes the processes and activities of the performing organization that determine quality policies, objectives, and responsibilities so that the project will satisfy the needs for which it was undertaken. Quality requires policies and procedures to be implemented within the project's context and the organization's quality management system since, if deemed appropriate, it supports continuous process improvement activities as undertaken on behalf of the performing organization [14]. Quality works to ensure that the project requirements, including product requirements, are met and validated. Based on gathered information, quality as a parameter could be studied under seven groups: (1) Standards compliance, (2) Cost estimation, (3) Proper building methods, (4) Role of sub-contractors, (5) Machinery, (6) Technology, and (7). Quality material. O4 and C7 believe standards compliance satisfies the required quality of projects but C3, O6 and O7 reject this and believe standards compliance just leads to completing the project and does not have any roles in achieving the necessary quality. For reaching proper quality in

healthcare projects, proper administrative and materials should be used. O8 with 40 years of experience in this field believes choosing proper minor contractors and up-to-date technology usage are important factors in project implementation. C4 and O1 mentioned the important role of proper cost estimating in reaching high quality and added improper cost estimating would lead to challenges regarding machines usage and the quality of the project is greatly threatened by wrong choices. O6 while confirming this topic declared by developments in knowledge, technology and variety in software had increased the mistakes in costs estimation in recent years. C2 is a well-known specialist who emphasizes on the quality of the project which has a direct effect on hospital working efficiency and people's health and decrease in quality sometimes leads to doubling the patients' illness. He pointed that in project Z lack of required quality in patients' rooms worsened 5 patients' conditions.

4.5. Human Resource

Human Resources include the processes that organize, manage, and lead the project team. Project team members may have various skill sets, may be assigned full-time or part-time, and may be added as team members during planning. This adds their expertise to the process and strengthens their commitment to the project. Moral factors, team work and knowledge are three reviewable groups of human resources. The role of human resources is undeniable in the success of a project (C3). Human resources could be parameter of success when they go along order, accuracy, honesty and working consciousness. Doing the work just for the sake of getting it done would not help the project (O7). C5 and N2 while confirming O7's ideas added lack of motivation in human resources of a project is one of the concerns of contracting companies. While confirming previous ideas mentioned project X in which lack of motivation by human resources led to delay. O1 referred to teamwork and its effect on working efficiency, believing wrong and sudden decisions and personal interest of some top executives are strong inhibiting factors for reaching success. C6 rejected this theory and defended high executives and believes administrative health work dominates healthcare projects. C4 and O5 consider using experts as the easiest way for reaching success and believe using inexperienced and irresponsible human resources is a parameter that healthcare projects are facing. O8 agrees with this idea and expresses education is a fundamental and undeniable parameter and believes that using young, educated and well aware of new technologies human resources along experienced ones is a fast way to reach success.

4.6. Risk

Risk includes the processes of conducting risk management planning, identification analysis, response planning, and controlling risk on a project. The objectives of project risk are to increase the likelihood and impact of positive events, and decrease the likelihood and impact of negative events in the project. Proper risk management could be one of the factors in success of projects. The importance of project risk management has been needed more and more but activists in construction industry are still facing the problem of risk being unknown and unidentified. Identifying the risks of a project and finding proper solutions could improve the success of the project (N4). C7 agrees with N4 and believes the uncertainty of project could be decreased by ensuring of identification of risk.

4.7. Environmental

Since the emergence of human being on Earth, he has dealt with nature and has always tried to control its destruction (N2). Humans have altered the nature along their needs and this alteration went on until the point that humans are the main reason of destruction of the environment. Thus, environmental protection while completing a project has an important role in its success, but unfortunately it has been ignored (O2). O5, by approval of this view, believes that the effects of administrating the projects should be considered in primary studies of project and proper solutions must be offered for these undesirable effects. C1 refers to project X in which improper design of wastewater treatment system of the project cause problems for the region's ecosystem. O7 believes before constructing healthcare projects their adverse effects on the environment should be studied to choose a location with the least harm to the environment.

4.8. External Matters

External matter could be studied under three groups: politics, economy and rules and regulations. O8 has a specific emphasis on rules and regulations and their effect on the success of projects and gives several examples during his 40 years of experience in healthcare projects of how violating the rules and regulations led to project's failure. He believes funding problems have always been challenging for the projects in Iran and led to their higher uncertainty. C4 confirms O8 and adds the rules are unanimous in favor of employer being one of the factors of failure. C6 rejects C4 and O8 ideas and speaks of the complete rules and refers to less important role of politics in success of projects. C5 agrees with C6 regarding the complete rules but believes political and economic factors are inseparable from the success of projects.

5. Discussion and Conclusion

Based on conducted analysis it could be said that interviewees are only well aware of the management triangle and believe money is the solution to all the problems. Proper choosing along with knowledge and using young human resources with management knowledge side by side with experienced managers could help the success of the projects. Due to the importance of healthcare projects, this research was conducted with the purpose of identifying factors of success in healthcare projects. To recognize its hidden angles, an interview was conducted with activists in construction industry with at least 15 years of experience. After interviewing 20 of them, the factors of success were divided into 8 themes which were fully explained. It seems that effective people in healthcare projects are either not aware of success factors or lack the knowledge to administer them. One parameter that can be mentioned is absence of a single manager for all the projects. Works in healthcare projects of Iran is in a way that each employer, consultant and contractor have a project manager for the project with different styles of management. Lack of coordination and management knowledge along with weak communication among these managers cause long delays in completion of these kinds of projects or often lead to complete failure. In case that these problems are not solved, decrease in success of projects would be less and less. A certain opinion could only be given, if all the factors of success in projects are considered at the same time.

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Appendix 1: The Demographics of the Interviewees

| ROW | CODE | ROLE | Education | Field | Experience (year) | Organization Type |
|------------|-------------|-----------------------|------------------|----------------|--------------------------|--------------------------|
| 1 | C1 | Project Administrator | Bachelor | Civil Engineer | 15 | Client |
| 2 | C2 | Physics | Specialist | Oncology | 30 | Client |
| 3 | C3 | Project Manager | Bachelor | Civil Engineer | 20 | Client |
| 4 | C4 | Project Manager | Bachelor | Civil Engineer | 20 | Client |
| 5 | C5 | CEO | Master | Law | 20 | Client |
| 6 | C6 | Project Manager | Master | Civil Engineer | 20 | Client |
| 7 | C7 | Project Manager | Bachelor | Civil Engineer | 17 | Client |
| 8 | N1 | Project Administrator | Bachelor | Civil Engineer | 25 | Consultant |
| 9 | N2 | Project Administrator | Bachelor | Civil Engineer | 18 | Consultant |
| 10 | N3 | Project Administrator | Bachelor | Civil Engineer | 16 | Consultant |
| 11 | N4 | Project Manager | PhD | Architecture | 20 | Consultant |
| 12 | N5 | Project Manager | Bachelor | Civil Engineer | 17 | Consultant |
| 13 | O1 | Project Manager | Bachelor | Civil Engineer | 25 | Contractor |
| 14 | O2 | CEO | Bachelor | Mechanics | 35 | Contractor |
| 15 | O3 | CEO | Bachelor | Mechanics | 36 | Contractor |
| 16 | O4 | Project Administrator | Bachelor | Civil Engineer | 18 | Contractor |
| 17 | O5 | Project Manager | Bachelor | Management | 17 | Contractor |
| 18 | O6 | CEO | Bachelor | Civil Engineer | 35 | Contractor |
| 19 | O7 | Project Manager | PhD | Civil Engineer | 16 | Contractor |
| 20 | O8 | Project Manager | Master | Civil Engineer | 40 | Contractor |