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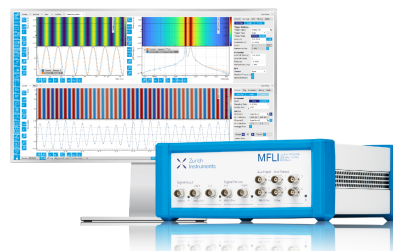
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Critical Success Factors For Construction Project

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Abstract. A construction project failure primarily defined as disappointment in either one or the combination of cost, time, quality, and management. This study is an effort to identify the Critical Success Factors (CSFs) and the relationship between various attributes of a project success. A preliminary comprehensive literature study of previous research works served as the basis of the CSFs, which will be the guide factors to predict the probability of a project success. At the end of the study, the contribution of each critical success factor to the project success will be established.

INTRODUCTION

Preliminary study on Critical Success Factors (CSFs) and the relationship between various attributes are essentially needed in identifying the project success. The important critical success factors will have direct impact on a construction project. All industries nowadays are dynamic and the construction industry is not excluded. In fact, construction projects involve in one of the most vibrant and complex environment. The increasing of uncertainties in technology, budget and development process create a dynamic construction industry [1].

The Tenth Malaysia Plan (2011-2015) has concentrated in providing sufficient major construction project developments which includes the civil engineering work, residential, and non-residential projects [2]. Most of the players are expected to participate extensively to achieve the goals. Projects which cannot attain the aims shall cause negative impact to the clients, contractors and others.

In developing countries such as Malaysia, construction industry directly and indirectly related to a big portion of the economy. The construction industry plays a major role in the economy as its share of the Gross Domestic Product (GDP) and its interaction with other sectors of the economy [4]. When the project complete on time, on budget and achieves the performance goals, it is considered as success [3]. However, there are a few projects which were not completed on time. Therefore, there is a need for the organizations that involve in construction projects to come out with the strategies on how to guide the project until it becomes success in the future.

In the construction industry; time, cost and quality have long been defined as the basic criteria and factors of measuring success. However, other several ideas have been appeared from different researchers. The structure of this paper is first, the project success and its definition within the construction industry will be reviewed. This is followed by introducing the concept of Critical Success Factors in the construction projects. The final section will concludes the article and summarizing the literature review by previous researchers.

CRITICAL SUCCESS FACTORS FOR CONSTRUCTION PROJECT

Project Success

The success of a construction projects is an important issue for most of the governments, users and communities. In modern construction projects there are significant challenges for both the clients and contractors to deliver the project successfully due to increasing complexity in design and the involvement of stakeholders [5]. In the project management literature, project success has been widely discussed by many researchers. Most of the studies in project success have been focus on dimensions in how it is measured and other specific factors influencing the project success [6]. For an architect, a project is success base on the aesthetic performance, and for a contractor, project is success when the contractor gets a profit from the project [7].

Project will be considered as success when the project is completed on time, within budget and the quality is satisfied by all [7]. Success also can defined as much better results than the expected or normally obtained in term of cost, schedule, quality, and safety. The meaning of ‘success’ itself has undergone many changes due to involvement of so many stakeholders in nowadays complex project environment [7]. The concept of project success is developed with criteria and standards to help project participants to complete projects with the most desirable results [8]. However, this concept remains somewhat of an enigma as there is no agreement on what should be the critical success criteria on construction projects despite several studies [9]. A project is considered an overall success when the project achieves the technical performance specifications and missions, also a high level of satisfaction concerning the project outcome among organization, project team and users [10]. The successful accomplishment of cost, time, and quality objectives were regarded as project management success which is directly; project success deals with the final project objectives [11].

Critical Success Factors (CSFs)

Numerous lists and models of Critical Success Factors (CSFs) have been proposed in the literature by many researchers [12]. Since the 1950s, project scheduling problems based on the assumption that the development of better scheduling techniques would result in better management and thus the successful completion of projects has been focused by most of the work in project management [12].

There are four separate dimensions of CSFs in project success [13]. The first dimension is meeting design’s goals which is refers to the contract that was signed with the client. The second dimension is the benefit to the end users which is refers to the benefit to the customers from the project end products. The third dimension is benefit to the developing organization and refers to the benefit gained by the developing organization as a result of executing the project. The last dimension is the benefit to the national technological infrastructure, as well as to the technological infrastructure of the firm that was engaged in the development process. The combination of all these dimensions gives the overall assessment of project success [13].

Four dimensions of success with a timeframe of expected results have been studied [14]. The first dimension has a short term goal of project efficiency which is meeting cost time goals. While, the second dimension has a medium term goal of customer success which is meeting a technical specifications, functional performance solving customer’s problem that triggered the project right outcomes. The third dimension has a long term goal of business success in commercial success and gaining increased market share that for aid projects could be generating confidence, satisfaction and also influence. Finally, the fourth dimension has a very long term goal of preparing for the future in developing new tools, techniques, products, markets etc [14].

The factors analysis reveals nine underlying cluster namely: (i) safety and quality; (ii) past performance; (iii) environment; (iv) management and technical aspects; (v) resource; (vi) organization; (vii) experience; (viii) size/type of previous projects; and (ix) finance [15]. Factors such as turnover history, quality policy, adequacy of labour and plant resource, waste disposal, size of past project completed, and company image are most significant factors affecting project success. Hence, this paper is set to explore the success criteria and their success factor that influence those criteria to achieve project success [15].

The project success is divided into four dimensions of time-dependent [16]. The first dimension is the period during project execution and right after project completion such as completion on time and budget. The second dimension can be assessed after a short time when the project has been delivered to the customer and it is focused more about satisfaction, functional of product and technical specifications. While, the third dimension can be

assessed after a significant level of sales has been achieved in one to two years and it will show the organization performances. The last dimension can only be assessed three to five years after project completion, it about preparing for the future [16].

The other perspective and with different way to show a success criteria is found from the paper ‘Criteria of Project Success: an exploratory re-examination’, the project success should be viewed from different perspectives of the individual owner, developer, contractor, user, and the general public [17]. The success criteria of project success are divided into two categories such as the micro and macro viewpoint. The micro viewpoint is measured on time, cost, quality, performance and safety while the macro viewpoint is measured on time, satisfaction, utility and operation [17].

In the technical article on “Project Success Attributes”, the tools that would allow team members and client personnel to formalize the way they evaluate project success has been introduced [18]. Project success attributes of the article viewed on the management issues of thing and people. Management of thing issues are achieved cost against budget, schedule on time, quality and scope as needed etc. Management of people issues are related to productivity, cooperation, responsibilities and client satisfaction [18].

The study of project success and the critical success factors (CSFs) are considered to be a means to improve the effectiveness of a project. The measurement of success factors has been proposed into five main groups namely project management action; project procedures; project related factors; human related factors; and external environment [8]. The five main groups of success factors have discussed about cost, time, quality, management, technology, safety, organization and environment in the construction project [8].

The success criteria for a construction project is not only evaluate the cost, time and quality as a success factors but also including the successful of project management, organizational success and the customer satisfaction [19]. Another perspective was stated were the importance of organizational’s planning effort, project manger’s commitment and safety precaution in order to complete the construction project complete by meeting cost, meeting on time, follow the schedule accurately and meeting the quality needed to ensure the project success[1]. Reviewing of the relevant literature suggests that different criteria were hypothesized by different researchers [7]. The literature reviews by different researchers have been summarized and show in the Table 1.

TABLE 1: SUMMARY OF SUCCESS FACTORS BY PREVIOUS RESEARCHERS

Author	Critical Success Factors (CSFs)									
	COST	TIME	QUALITY	SATISFACTON	MANAGEMENT	SAFETY	TECHNOLOGY	ORGANIZATION	ENVIRONMENT	RESOURCES
Sadeh et.al. (2000)	X	X	X	X	X		X			
Paul Steinfort (2007)	X	X	X	X	X		X	X		
Alzahrani and Emsley (2013)	X	X	X		X	X		X	X	X
Shenhar et.al (2001)	X	X	X				X	X		
Lim and Mohamed (1999)	X	X	X				X			
Dr. Parviz (2003)	X	X	X	X	X					
Chan et al. (2004)	X	X	X		X	X	X	X	X	
Sigurour (2009)	X	X	X	X	X			X		

Note: ‘X’ is refer to the conclusion of CSFs from previous researchers

DISCUSSION

There are many factors that can make a project is success or cause it fails. Table 1 has shown the summary for project evaluation criteria by previous researchers. Table 2 has shown the percentage of Critical Success factors that found from literature review. Almost all researchers stated that cost, time, quality and management as the Critical Success Factors of their literature review. From the summary of the literature review, we can conclude that the project is success when it complete by meeting cost, meeting on time, follow the schedule accurately, meeting the quality needed and managed by the best team members. Technology also has been one of Critical Success Factors that contributes to a construction project success.

TABLE 2: PERCENTAGE OF CRITICAL SUCCESS FACTORS

No.	Critical Success Factor	Total	%
1.	Cost	8	16.3
2.	Time	8	16.3
3.	Quality	8	16.3
4.	Satisfaction	4	8.2
5.	Management	6	12.2
6.	Safety	2	4.1
7.	Technology	5	10.2
8.	Organization	5	10.2
9.	Environment	2	4.1
10.	Resources	1	2.0
Total		49	100

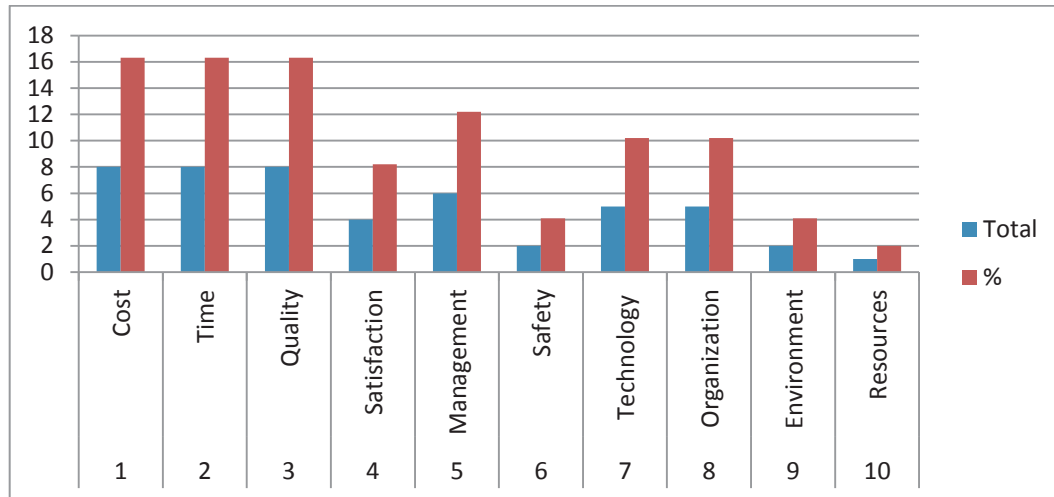


FIGURE 1: THE PERCENTAGE AND TOTAL OF CRITICAL SUCCESS FACTORS (CSFS)

CONCLUSION

Project success is a topic long-discussed in the construction management field over a period of time. From the summary for project evaluation criteria by previous researchers, it becomes clear that success needs to be investigated from various perspectives. The review of the eleven leading journals on project success reveals that cost, time, quality and management are the four basic factors of success measurement and the most important of Critical Success Factors in construction projects success. Other measures, such as safety, technology, satisfaction, and etc are attracting increasing attention. According to the Table 1, most researchers have state that the cost (budget), time, quality and management as the main of Critical Success Factors (CSFs) in project success. Automatically, when the construction project completed with the accurate time, budget and quality, the project is becoming success. Therefore, this Critical Success Factors (CSFs) shall be used as guide factors to predict the probability of project success in the future.

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