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**PRELIMINARY STUDY ON CRITICAL SUCCESS FACTORS FOR  
CONSTRUCTION PROJECTS IN MALAYSIA**

Nor Janna Tammy\*, Norhalifah Ramlee, Siti Rashidah Mohd Nasir,  
Raja Nor Husna Raja Mohd Noor, Che Khairil Izam Che Ibrahim &  
Chan Hun Beng

*Faculty of Civil Engineering, Universiti Teknologi Mara (UiTM), 13500 Permatang  
Pauh, Penang, Malaysia*

\*Corresponding Author: *norjanna@ppinang.uitm.edu.my*

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**Abstract.** Construction projects are essential in achieving project goals and any failure should be avoided since any unsuccessful projects can give negative impacts to clients, governments and also contractors' reputation. However, some projects are not being completed on time unlike some others which are successfully completed. This study is a preliminary effort to identify the Critical Success Factor and the most significant factors which influence the construction project success. The selected success factors in this study are identified by conducting a comprehensive literature study from various researchers in the related field. The completed studies of Critical Success Factors by previous researchers will be the guidelines for construction players to predict the probability of project success in the future. At the end of the study, the contribution of critical success factors and the most significant factor that influence project success will be identified.

**Keywords:** *Critical success factors, construction, project success*

## **1.0 Introduction**

Preliminary study on Critical Success Factors and the most significant factors influencing project success is essentially needed. The most important critical success factors will have direct impact on construction projects. Naturally, the construction industry is one of the most dynamic industries and in complex industrial environment. A dynamic construction industry was created by the increasing of uncertainties in technology, budget and development process [1].

Tenth Malaysia Plan (2011-2015) has concentrated in providing sufficient major construction project developments including the civil engineering work, residential, and non-residential projects [2]. Most of the participants in the project management will give their full commitment in order to complete the projects successfully. This is because, the

unsuccessful projects can give unfavorable impact not only to the clients, governments, or public but also to the reputation of the contractors themselves.

When the projects complete on time, are within budget and achieve the performance goals with the accomplishment of the quality and specification needed, they will be a successful achievement to construction players who will have a better reputation in the future [3]. In developing countries, construction projects contribute a high percentage of the economic growth. The construction industry plays a major role in the economy especially in gross domestic products besides interacting with other sectors of the economy [1]. However, there are a few projects which were not completed on time unlike other successfully completed construction projects[4]. Therefore, there is an urgency for the organisations that are involved in construction projects to have the strategies on how to guide every construction project until successful completion in the future.

In the construction industry; time, cost and quality have long been defined as the basic criteria and factors of measuring success [5] and the success factors that contribute to project success are assorted for each construction project [4]. However, different ideas have been transpired from different researchers. Therefore, the significance of this study is to review critical success factors for construction projects and identify the most significant factors influencing construction project success. The structure of this paper is adhering to the research objectives. Firstly, the project success and its definition within the construction industry will be reviewed. This is followed by the introduction of the concept of Critical Success Factors in the construction projects. The final section will conclude the article and summarise the literature review by previous researchers.

## **2.0 Critical Success Factors for Construction Project**

### *2.1 Project Success*

The success of construction projects is an important issue for most governments, constructions' participants and users. In modern construction projects, there are significant challenges for both clients and contractors to deliver the project successfully due to increasing complexity in design and the involvement of stakeholders [6]. In the project management literature, project success has been widely discussed by many researchers. Most of the studies in project success have been focused on measurement criteria and other specific factors influencing the project success. Different people will give a different meaning and assumption of project success [7]. For example, the aesthetic performance is the main success criteria for project success from architectural perspective but for a contractor, projects become successful when the contractor gets a profit from the project [8].

Projects will be considered successful when they are successfully completed on time, within budget and when the stakeholders are satisfied with the quality [9]. Success can also be defined as greater results than expected or normally obtained in term of cost, schedule, quality, and safety. Nowadays, the meaning of success is different and changes due to the involvement of so many stakeholders in a complex project environment [9]. The concept of project success is developed with criteria and standards to help project participants to complete projects with the most desirable results and with the specification needed but there is no agreement on critical success factors in this concept despite several studies [10]. The project is considered an overall success when the project achieves the technical performance specifications and missions, and when there is a high level of satisfaction concerning the project outcome among organization, project team and users [11]. The successful accomplishment of cost, time, and quality objectives are regarded as project management success which directly deals with the final project objectives [12][11]. Figure 1 show the conceptual relationships in project success.

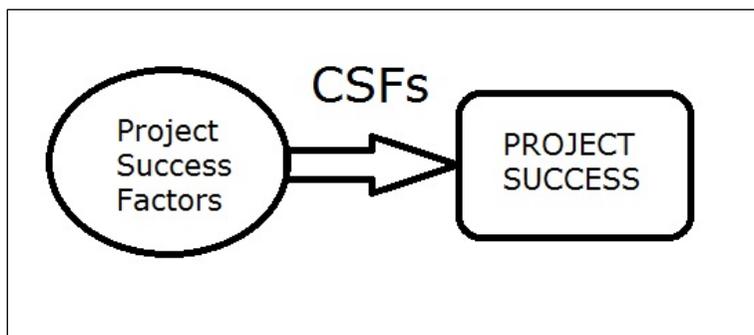


Figure 1: Framework of Project Success

## 2.2 Project Success Factors and Critical Success Factors (CSFs)

The project success factors are the items that influence the construction project success and some items from them are classified and used as a dominating measurement of project success criteria such as cost, time and quality [5][6]. The success factors are also classified as contribution factors in order to ensure the successful completion of the construction project [4]. Critical Success Factors (CSFs) have numerous lists and models which are defined as factors to predict success and they are critical in delivering the construction projects and they are deemed the success factors in general and CSFs in particular depend on the project objectives and scopes [13][14].

There are four separate dimension of CSFs in project success [15][3]. The first dimension is meeting design goals which refers to the contract that has been signed

with the client. The second dimension is the benefit to the end users which refers to the benefit to the customers from the project end products. The third dimension is the benefit to the developing organisation which refers to the benefit gained 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 are engaged in the development process. The combination of all these dimensions give the overall assessment of project success [3][15][4].

The success criteria and their success factors affecting project success are explored and the factor analysis reveals nine underlying clusters namely: (i) safety and quality; (ii) past performance; (iii) environment; (iv) management and technical aspects; (v) resource; (vi) organisation; (vii) experience; (viii) size/type of previous projects; and (ix) finance [6].

Project success attributes are viewed on management of thing issues and management of people issues in which the consideration of management of thing issues are achieved cost on budget, on time schedule, required quality and scope, whereas management of people issues are related to productivity, cooperation, responsibilities and client satisfaction [16][17][5]. The study of project success and the critical success factors (CSFs) are considered to be means to improve the effectiveness of projects. The measurement of success factors have been proposed into five main groups which are project management action; project procedures; project related factors; human related factors; and external environment [10]. The five main groups of success factors have discussed cost, time, quality, management, technology, safety, organisation and environment in the construction projects[10][18][19].

The success criteria for construction projects do not only rely on evaluated cost, time and quality but also depend on the success of project management, organisational success and customer satisfaction [18][19]. Another perspective discusses the importance of organisational planning effort, project manager's commitment and safety precaution in completing the construction projects by meeting cost and time, following the schedule accurately and meeting the quality needed to ensure the project success [1][20][21][24]. Reviews of the relevant literature suggest that different criteria are hypothesized by different researchers [9]. The literature reviews by different researchers have been summarised and shown in Table 1 and the description of items Critical Success Factors (CSFs) is explained in Table 2.

Table 1: Summary of Success Factors by Previous Researchers

Author	Critical Success Factors (CSFs)									
	COST	TIME	QUALITY	SATISFACTON	MANAGEMENT	SAFETY	TECHNOLOGY	ORGANISATION	ENVIRONMENT	RESOURCES
Sadeh et.al. (2000)	X	X	X	X	X		X	X		
Shenhar et.al (2001)	X	X	X	X			X	X		
Parviz (2003)	X	X	X	X	X					
Chan et al. (2004)	X	X	X		X	X	X	X	X	
Steinfort et.al (2007)	X	X	X	X	X		X	X		
Nasir (2008)					X				X	X
Takim et.al (2008)	X		X	X	X	X				
Sigurour (2009)	X	X	X	X	X			X		
Rohaniyati Salleh (2009)	X	X	X		X	X		X		
Al-Tmeemy et.al (2010)	X	X	X	X	X					
Tan et.al (2011)				X			X	X	X	
Yong (2012)	X				X	X				X
Alzahrani and Emsley (2013)	X	X	X		X	X		X	X	X
Gunathilaka et.al (2013)	X	X	X		X					X
Norizam et.al (2013)										
Micheal (2014)	X	X			X		X	X	X	X
Alias et.al (2014)	X	X	X	X	X					

Note: 'X' refers to the conclusion of CSFs from previous researchers

Table 2: Description of CSFs

Critical Success Factors (CSFs)	Items in CSFs
Cost	<ul style="list-style-type: none"> <li>- Material cost</li> <li>- Labor cost</li> <li>- Plant cost</li> <li>- Cost overrun</li> <li>- Financial support</li> </ul>
Time	<ul style="list-style-type: none"> <li>- Pre-construction stage</li> <li>- Construction stage</li> <li>- Time overrun</li> <li>- Scheduling management</li> <li>- Time management</li> </ul>
Quality	<ul style="list-style-type: none"> <li>- Product quality</li> <li>- Services quality from team members</li> </ul>
Satisfaction	<ul style="list-style-type: none"> <li>- Client satisfaction</li> <li>- Consultant satisfaction in design</li> <li>- User expectations</li> </ul>
Management	<ul style="list-style-type: none"> <li>- Project manager performance</li> <li>- Team members cooperation</li> <li>- Project manager's skills</li> </ul>
Safety	<ul style="list-style-type: none"> <li>- Safety and health assurance</li> <li>- Safety precaution at site</li> <li>- Quality assurance</li> </ul>
Technology	<ul style="list-style-type: none"> <li>- Technical specification</li> <li>- Functionality</li> </ul>
Organisation	<ul style="list-style-type: none"> <li>- Size / type of past project completed</li> <li>- Company image</li> <li>- Company experience</li> </ul>
Environment	<ul style="list-style-type: none"> <li>- Waste management on site</li> <li>- Environmental material</li> <li>- Working environment</li> </ul>
Resources	<ul style="list-style-type: none"> <li>- Labor at site</li> <li>- Plant and technology involved</li> <li>- Stakeholders support</li> </ul>

### 3.0 Discussion

There are many factors that can make a project a success or failure. Table 1 shows the summary for project evaluation criteria by previous researchers. On the other hand, Table 3 and Figure 2 shows the percentage of Critical Success factors elicited from literature reviews. Most of the researchers have stated that cost, time, schedule, quality and management are the Critical Success Factors in their literature review. From the summary of the literature review, we can conclude that a project can be considered as successful when it is completed by meeting estimated cost, has a good management team which is managed by the best team members, meets the deadline by following the

schedule accurately and fulfills the quality required. The satisfaction and organisation are also the Critical Success Factors which contribute to a construction project success.

Table 3: Percentage of Critical Success Factors

No.	Critical Success Factor	Total	%
1.	Cost	14	15.22
2.	Time	13	14.13
3.	Quality	12	13.04
4.	Satisfaction	9	9.78
5.	Management	14	15.22
6.	Safety	5	5.43
7.	Technology	6	6.52
8.	Organisation	9	9.78
9.	Environment	5	5.43
10.	Resources	5	5.43
Total		92	100

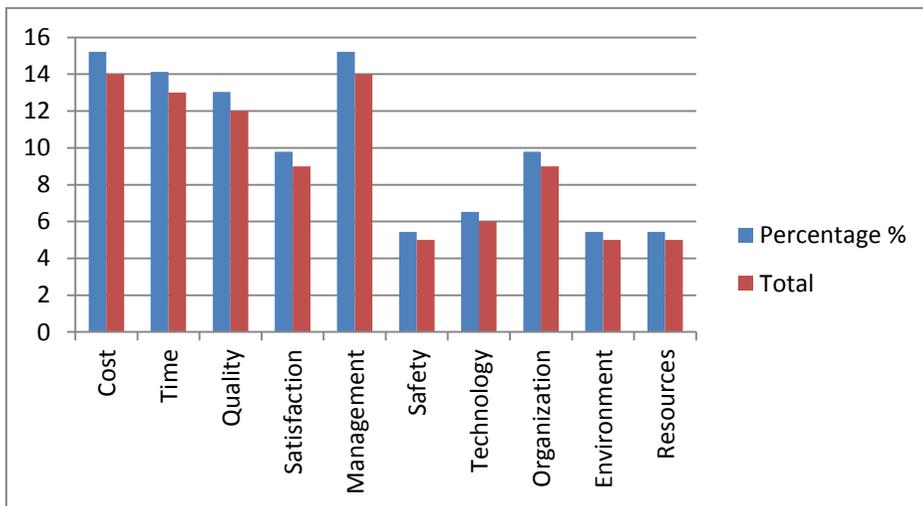


Figure 2: The percentage and total of Critical Success Factors (CSFs)

#### 4.0 Conclusion

Project success is a topic long-discussed in the construction management field over a period of time. From the summary of project evaluation criteria by previous researchers, it is 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 and satisfaction, are attracting increasing attention. According to Table 1, mostly previous researchers have stated that cost (budget), time, quality and management are the main Critical Success Factors (CSFs) in project success. Automatically, when the construction project is completed within the projected time, budget and quality, the project is a success. Therefore, these Critical Success Factors (CSFs) will be used by construction players as the guiding factors to predict the probability of project success in the future.

## 5.0 Acknowledgements

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