

# How Do We Measure Project Success? A Survey

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## Abstract

In fact, the principal objective of all projects is to be successful. Doubts often arise about what and who actually determine project success. Many success criteria (SC) have been proposed and considered in the previous years to handle the project success issue. The main purpose of this paper is to explore success criteria of the project from various perspectives of people looking at the project. A comprehensive technical survey of the recent papers which identified the success criteria of the project was conducted. An analysis of this survey yields many criteria which can be used to determine if the project is successful or unsuccessful. Findings show that the most important criteria to measure the successful of the project are four criteria listed in order of their significance as Time, Quality, Cost, and Scope.

**Keywords:** Success; Criteria; Measure; Project; Project management

## Introduction

There is a growing need in various constructions industry to identify essential success criteria so that constructions executive and project managers can suitably plan resource allocation [1]. Surprisingly, the meaning of project success still somewhat unclear. Despite several studies, the concept of project success has not been well-defined anywhere in project management literature. Moreover, the ascription of success and failure is a social accomplishment dependent on the view of the issue [1]. Thus, success and failure are more complicated to define and measure because they indicate various views to diverse people.

Apart from uncertainty in identifying the suitable criteria, there is also disagreement about definitions [1]. We don't clearly know if there is a difference of criteria of success between various types of project and what criteria must we select for most complicated projects. There are specific success factors in which we can judge the success of the project. Sometimes those factors are not success factors in other projects. Also, what is accepted in one project can have the different impact in other projects [2].

This paper presents a literature survey in Section II. An identifying the set of attributes that we used to compare the different approaches surveyed are outlined in section III. In section IV, a comparison between approaches surveyed based on identified attributes is conducted. In section V, we described the comparative analysis of approaches surveyed. Section VI shows the conclusion with some useful remarks.

## Literature Review

Another survey of defining the project success term was conducted [2]. In this study, it was proven that not always the professionals' opinions match the recorded literature, especially over the importance of the factors and criteria of project success. In contrast to professionals' opinion, the literature review revealed that the most significant success factor of the project is time, however, the most significant factor on the survey is the top management support. Additionally, survey participants believed that cost, risk, time, quality, and eventually scope control must be merged within a single definition of the most general concept of project control. And hence, this was considered as a success criterion of high importance. Another conclusion of the previously mentioned work is that around 43% of the professionals surveyed stated that the term of project success is identical to the concept of project management success, while, the other 46% of participants believed that the success of project and project management success is totally different terms. Accordingly, researches of different industries must take the differences of these two topics into considerations on their

work to avoid inaccurate results on determining project success factors.

During the sixties, the main project's success criteria were mainly focused on just the completeness and operational premise. However, the earlier studies of the eighties added the concept of cost, quality, and time to the project successfulness measurement factors. Usually, within most of the literature of project management, the term of project effectiveness is identical to project success. Mainly, success is defined as the opposite of failure, a social status level, and achievement of an objective," [Wikipedia]. And hence, there is no particular measure of project success or effectiveness [3]. Various approaches with different outcomes that are used to form the organizational setting was introduced and discussed [4]. In this reference, the dimension of effectiveness could involve: (1) effectiveness of performance, (2) attitudes of the member, and (3) behavioral resultants.

Additionally, authors have concluded that the decision of project successful should be measured using at least the given three criteria of the efficiency of the project namely; direct and business success, the effect on the customer, and future planning [5]. Beside, the authors have studied the effect of certain combinations of project structure type on generating a final decision of how successful is a certain project [6]. These studies were based on project success dimensions and measured mentioned [5]. Additionally, the concept of project success was defined together with triple constraints dimensions namely; time, quality, and budget. And hence, the inside dimension of the competency of success acquires technical success, fulfilling a new product cost target and an external dimensions of success dimension namely; image gain, market shares meeting, financial success, and meeting the new product regular requirements [7].

In order to distinguish between success itself and success criterion that evaluate it, in the literature [8], this issue was resolved by authors work [9]. These methods are generally consists of two different components, namely: I) success of project management i.e., quality, time, satisfaction of stakeholder; and II) The success of project i.e., meeting strategic organizational objectives goal, user need satisfaction

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i.e., satisfy stakeholders that is related to product, purpose user/customer, and additionally, illustrating the subsequent properties of the success of the project namely; I) the dependent of the success of a product is the project management success, II) success of a product is influenced by the success of project management and III) time significantly affect the project management success.

In general, a project is defined as a success project if both project product and project management are a success [10].

On the other hand, it was claimed that the successful of a certain project is also related to the concentration of project quality and performance whom found to be highly related. Mainly, project organization success should concentrate on the team, project management, organization, environment, product, resources and related technical factors [11].

Another perspective of project success was introduced [12]. In this reference, authors claimed that People say that a project is successful if and only if the project management is concerned and the project is complete within the specified time, the given budget and meets the requirements of the customer with a predefined quality.

Significant experimental data on the issue of defining project success was introduced by composing a survey that is consist of 150 members of Australian managers of different projects on the context of project success criteria [13]. This method mainly depends on analyzing the survived data from two different prospective namely; 1) Those that understood project success simply as the traditional objectives of project quality, cost, and time; and 2) the other parts who considered the project success as the effectiveness of the product of the project.

The authors applied study to find the success criteria that determinant the of success in Mass house building projects [1]. They used a questionnaire survey to set property developers' view of the critical criteria of success in Mass house building projects in Ghana. The results which came from analyzing the survey were interesting in respect to how business developers understand the significance the criteria of project success. The results which came from factors analysis operation introduced four group namely; in order of their importance as environmental impact, customer satisfaction, time and cost and quality.

The authors introduce the study to investigate the success signs as views by professionals in software based on the features internal to the project organization [14]. They found that scope is supposed to be the most significant success criterion. Time and cost came after the scope in this study.

To ensure the success of projects the authors examined the project management information systems as a means [15]. They obtained that the project can be viewed as a success if the project management is a success and the project product is a success.

The study [16], mentioned that a project is successful if the project is complete within time, within the given budget, scope, and meets the customer requirements with the specified quality.

According to PMBOK Guide, 2008, The basic general view of project success say that a successful project is that, the project meet time, scope and cost goals. Also, if the project satisfied the customer/sponsor and meet its main objective[17].

This paper focuses on how to define and measure project success [18]. This paper mentioned that project management success is focused on project management process and in particular on the successful

completion of the project with consideration to time, cost, and quality.

The authors presented new confirmation of the success understanding [19]. This study stated that the most import criterion for project success is customer satisfaction followed by objectives achievement. In addition, it reports that measuring the success of the project based on time, cost and quality are outdated.

The study is to show the most significant criteria of success from the common views of public project managers in several Western European countries [20]. They classified four separate views on the success of the project. In the first view, the time is rated most significant, in the second view, the budget is rated most significant. Several other criteria show the variation of view. Particularly safety, profitability for the contractor, requirements of stockholder and specific political or social factors are evaluated separately between the views.

Finally, authors has added another concept to the definition of project success [21]. This concept mainly depends on the aspects of risk management diversity of a certain organization, like executive risks, fluctuations of prices of the market share, technical risks, etc. This leads to the fact that the risk taken on a project management plane could be measured in terms present and future risks accuracy documentation specifying and how a plane of project risk, if presented by the companies and administrations, is measured in terms of plane effectiveness.

## Evaluation Attributes

We reviewed the most related and recent papers published in reputable conferences and journals. The tools such as Google, Google Scholar, Scopus, are used to find the literature of the topics identified. The keywords used to search the reference articles include "Project Success", "Measuring Project Management Success", "Critical Success Factors", "Critical Failure Factors", "Product Success", and "Project Success Metrics". We will classify and compare them based on some defined evaluation criteria. The evaluation attributes might include the following:

- The criteria used to measure the success of project: These criteria used to measure either the project succeed or fail, such as:
- **Cost:** We can say that the cost is successful if it satisfying the budget.
- **Quality:** Can be defined by how match a set of inherent characteristics achieves requirements.
- **Time:** We can say that the time is success if it satisfies the schedule.
- **Scope:** Refers to all the activity required in building the products of the project and the method used to create them.
- **The performance of the project:** Measuring project performance grants the organization with a clear picture of the health of its projects and can grant trust in the project teams.
- **Satisfaction of stakeholder:** We can say that the stakeholders are satisfied if they meet their requirements and expectations.
- **Project efficiency:** Can be measured by the volume of outputs obtained per the inputs utilized.
- **The effectiveness of the product:** the effectiveness of the product can be measured by test the result of the project if it desired result or no.
- **Project goal:** Can be measured by meeting the objective of

build the project.

- **Project management success:** It mean meeting quality, time, satisfaction of stakeholder. [9]
- **Product success:** It mean meeting strategic organizational objectives goal, user need satisfaction i.e., satisfy stakeholders that is related to product, purpose user/customer [9].
- **Risk management success:** Risk management can be helpful in decreasing and reduce negative risks so the project can satisfy the time and cost and the goal of the project [17].
- **Environmental impact:** Possible adverse effects caused by a development, industrial, or infrastructural project or by the release of a substance in the environment.
- **The year of approach surveyed:** Defined the date when the approach surveyed is published.

### A Comparison of Approaches Surveyed

As a result of using attributes and criteria mentioned in section 3, Table 1 shows the comparison between approaches surveyed based on what every approach mentioned to be a criterion for a successful project.

### Analysis

By conducting a literature review and a compression between the twenty approaches surveyed, we found some of the analysis results. These results will be discussed as follow. The cost criterion was mentioned in most of the approaches surveyed. The frequency value of this criteria in approaches surveyed was 55%. Based on this value we can say that; this criterion is one of the most important criteria to measure the success of the project. The Cost criterion was mentioned in 11 approaches which is [1-3,7,12-14,17,18,20]. However, there is another criterion which is greater than Cost criterion. This criterion called Time criterion. This criterion is the most important criterion stated in our comparison because its frequency value was 65%. This

criterion stated in 13 approaches [1-3,7,9,10,12-14,16-18,20]. In addition, there is another important criterion. This criterion called Quality criterion. This criterion is the second important criterion to measure the success of the project. That mean it came after the Time criterion because its frequency value is 60%. The Quality criterion is stated in 12 approaches [1-3,7,9-13,16,18,20]. Another criterion called Scope. The frequency value of Scope criterion is 15% and it is stated in 3 approaches [14,16,17]. Therefore, we can say that this criterion has less important value to measure the successful of the project. Another less important criterion is called Performance of the Project. This criterion has the smallest frequency value in my study. Its frequency value is 5% and it is stated in one approach [11]. Also, there is another criterion has frequency value as same as Performance of the Project criterion which called Environmental Impact. This criterion is stated in one approach [1]. However, based on Table 1 there is another important criterion called Stakeholder Satisfaction. This criterion considered to be one of the most important criteria to measure the successful of the project because of its frequency value 45% and it is stated in 9 approaches [1,5,9,10,16,17,19-21]. There are three criteria have the same frequency value as Scope criterion. these criteria called Project Efficiency, Project Goal and Product Effectiveness. Also, these criteria are stated in 3 approaches. The Project Efficiency is stated in approaches [5,9,21], and Project Goal is stated in approaches [5,12,21] and Product Effectiveness is stated in approaches [3,4,13]. Finally, there are three criteria that have the same frequency value. These criteria are called Product success, Project management success, and Risk management. Two of these criteria are stated in the same approaches [10,15] while the Risk management criterion is stated in [2,21]. Table 2 shows the frequency value and percentage for criteria in approaches surveyed. Based on Table 2 and Figure 1 we observed that some of the approaches stated many criteria, while some of them involved only one criterion. The approaches which involved the maximum criteria are [1,10,16,17]. These approaches involved 5 criteria. In the other hand, the approaches which involved the minimum criteria are [4,21]. These approaches involved one criterion. Additionally, we observed that the most important criteria to measure the successful of the project are four

Study Number	Year	Cost	Time	Quality	Scope	Project Performance	Satisfaction stakeholder	Project Efficiency	Goal	Product Effectiveness	Project management success	Product Success	Risk management	Environmental Impact
Susan G Cohen, et al [4]	2015	√	√	√	-	-	-	-	√	-	-√	-	-	-
Aaron, et al. [5]	1997	-	-	-	-	-	-	-	-	√	-	-	-	-
Michael P, et al. [6]	2004	√	√	√	-	-	-	-	-	√	-	-	-	-
Hans Georg G, et al. [7]	2005	√	√	√	-	-	-	-	-	-	-	-	-	-
Amir AS, et al. [10]	2002	-	-	-	-	-	-	-	-	-	-	-	√	-
Hassan Haro B [12]	2012	√	√	√	-	-	-	-	-	√	-	-	-	-
Nitin A, et al. [14]	2010	-	-	-	-	-	√	√	-	-	-	-	-	-
Stamatia K, et al. [3]	2009	-	√	√	-	-	√	√	-	-	-	-	-	-
Muhammad NM, et al. [16]	2016	-	√	√	-	-	√	-	-	-	√	√	-	-
Project Management [17]	2009	√	√	√	-	-	-	-	-	-	-	-	√	-

Danie Van Der W, et al. [18]	1997	-	-	-	-	-	√	√	-	-	-	-	-	-
Jorge G, et al. [19]	2016	-	-	√	-	√	-	-	-	-	-	-	-	-
Morteza SG, et al. [2]	2008	√	√	√	-	-	√	-	-	-	-	-	-	√
Ahadzie DK, et al. [1]	2006	√	√	-	√	-	-	-	-	-	-	-	-	-
Francis H, et al. [21]	2016	-	-	-	-	-	-	-	-	-	√	√	-	-
Adam C, et al. [13]	2015	√	√	√	√	-	√	-	-	-	-	-	-	-
David B [9]	2008	√	√	-	√	-	√	-	√	-	-	-	-	-
Leonie K, et al. [20]	2005	√	√	√	-	-	-	-	-	-	-	-	-	-
Guru Prakash P [8]	2016	-	-	-	-	-	√	-	√	-	-	-	-	-
Goparaju PS [11]	2016	√	√	√	-	-	√	-	-	-	-	-	-	-

Table 1: A comparison of approaches surveyed.

Attributes	Percentage
Cost	55%
Time	65%
Quality	60%
Scope	15%
Performance of the Project	5%
Stakeholder Satisfaction	45%
Project Efficiency	15%
Project Goal	15%
Product Effectiveness	15%
Project management success	10%
Product success	10%
Risk management	10%
Environmental Impact	5%

Table 2: An analysis of approaches surveyed.

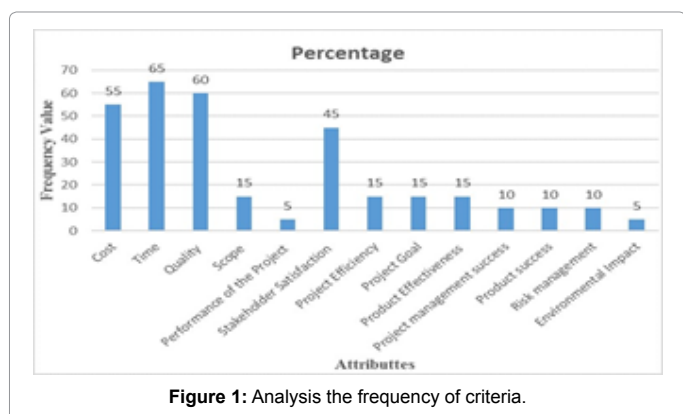


Figure 1: Analysis the frequency of criteria.

criteria named in order of their significance as Time, Quality, Cost, and Scope.

### Conclusion

The project success has become a concern for the industry. Because of the invisibility, complexity, and flexibility of projects. In this paper, the concept of project success was studied, also, a comprehensive technical

survey of recent approaches which identified the success criteria of the project was conducted. The number of approaches surveyed was twenty approaches. Additionally, we showed Table 2: An Analysis of approaches Surveyed the evaluation attributes. Then, the comparison between these approaches was applied. Findings of this comparison were discussed and analyzed to select the best criteria to measure the success of the project. As result of this analyzing the most important criteria for measurement the successful of the project are four criteria listed in order of their significance as Time, Quality, Cost, and Scope.

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