



# Investigation of Possible Dominance of Factors Affecting Project Success

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## Abstract

The bottom-line of project management is to produce the deliverables successfully. However, the various participants may interpret the term 'success' differently, and they assess the result of the project along with different indicators. A traditional, widespread, and clear set of indicators for the project managers are the time-cost constraints with the goal achieved in the right quality. Since the prediction and interpretation of success is a far more complex problem, researchers and experts have long been trying to answer the most critical questions relating to the success and failure of projects. Firstly, this paper provides a summary of how the traditional success approach evolved and how the researchers tried to extend the basic model and to grab its complexity. Secondly, the research goal is to formulate a research question on the possible dominance and effects of the factors. Finally, the authors develop the process and collect the possible mathematical-statistical tools supporting the previously mentioned goals. The founding of the research question in this article can lead to original assumptions, which highlights an area of research on the success that has not been explored so far. According to our intentions, this article lays the foundations for a thorough and comprehensive analysis for understanding better

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## 1. Introduction

The authors briefly review the conceptual foundations of project success based on previous works on this particular topic [1]. The aim is to develop further the role of perception described in the literature so far and to examine its dominance. Is perception able to overwrite other elements grouped in the literature when assessing project success?

The purpose of this research is to establish a statistical analysis by making groups of project participants based on their opinions about the project. Then, if these research goals are justified, the opinions of independent and homogeneous groups will be compared with the traditional project evaluation aspects. We conclude this article with a few thoughts on data collection and further potential research we intend to do. The ideal follow-up of these founding steps to identify those subjective opinions of participants, which have the most influence; and to create a model that can predict whether the project will be perceived successful.

## 2. Approaches to project success

The success of the project is assessed by taking into consideration the general goals of the project (or enterprise), while the success of project management is assessed based on traditional factors such as cost, time and quality. Many researchers concentrate on these two directions exclusively when researching the causes of success. The literature commonly distinguishes the success of the project from the success of

project management (e.g., [2]). Nevertheless, there is an apparent relationship between them –successful project management leads to a successful project.

The paths of analysis can be arranged into three classes: the factors affecting success have to be determined, the criteria of success defined, and their relationship examined [3]. The traditional cost-time-quality triangle appears in every project definition. Project managers consider these as criteria for success as an industrial standard. The shortcomings of the traditional approach, which can be considered the standard for project managers, have been addressed in several development attempts in recent decades. The result of these studies was a more sophisticated system of criteria or factors [4]. Some researchers build models that can handle many existing factors, but the irrationally large size of the model makes the problem unmanageable.

Many have realized that human assets have to be included in success criteria, in addition to the easily measurable technical parameters. Since these are not easy to quantify, less research has been done in this area compared to traditional factors [5]. Researchers have begun to introduce criteria connected to persons such as flexibility and adaptability, enthusiasm, spontaneity, aggressiveness, confidence, preferences related to initiative and leadership, ambition, verbal abilities, etc. On the human side, Yang and his colleagues suggested examining how the international character of the project and the leadership style affect success, in addition to the factors recommended by technical literature, such as teamwork, project type, sector of the industry, team size, etc. [6].

In researching the financial dimension of success, researchers have gone from supplementing traditional fundamentals and criteria with value creation to being able to measure overall success with a comprehensive financial indicator. While numerous extensions to the basics can be found in the literature, one of the most important is that the traditional triangle of criteria should be extended with the notion of creating and transmitting value. The final goal of the project manager was identified by some researchers to create business value [7].

### **3. Role of perception**

Verma (1995) stated that in addition to the accomplishment of traditional technical performance (specification) and the mission, success is also a function of communication, teamwork, and leadership [8]. Compared to the classical approach, Verma provided an entirely new approach to include perception and satisfaction into success factors. The roots of the idea go back ten years earlier. Several authors before Verma included perception as a new element in several ways (e.g., Baker, Murphy and Fisher in 1983 suggested taking into account the perception of project performance [9]).

Different stakeholders can, therefore, perceive success differently. Although the term stakeholder appeared in management literature as early as in the 1960s (e.g., Stanford Research Institute), almost twenty years passed before it was used in a sense used today. Freeman (1984) defined stakeholders as groups or individuals who are affected by and also affect the achievement of organizational goals [10]. The idea to examine stakeholders from the point of view of success appeared around the end of the 20th century [11]. Consistent with the principles of quality management, the “happy user” appeared among success factors.

Some papers of fundamental importance, however, have been published in this field in recent years. Originally a single stakeholder, the client was identified as a vital participant in addition to CSFs, and Jugdev and Müller (2005) investigated communication with the customer [12]. A step forward was when the owner and the sponsor were also identified as important stakeholders. Gradually it became clear for everyone how important the concept of perception is in the case of every stakeholder. Recently Davis (2013) added senior management, the project core team, and the project recipient stakeholder groups to the group of stakeholders relevant from the point of view of success [13]. Williams et al. (2016) evaluated project success in two areas: customer satisfaction and client relationship quality in project management [14]. This proves that the importance of perception also features prominently in up-to-date research.

The idea of perception has become common in the last decade and has appeared in many aspects in the fields related to project management. Marzagão and Carvalho (2016) included the perceived project performance as a critical success factor in their simplified Six Sigma model. They revealed independent latent variables, including project success perception. The research evinced that the Six Sigma Method (SSM) has an impact on project success perception [15]. Koops et al. (2016) identified four different perspectives on project success, each with their specific set of most and least essential success criteria with differences of opinion within the four groups. Also, the challenge revealed is to understand each other's point of view on the importance of the specific elements of product success: satisfies the needs of shareholders and stakeholders, fit for purpose, and specific political and social factors [16]. Fowler and Walsh (1999) realized the conflicting perceptions of success. The satisfaction was used as a measure of success, which raised the issue of the different perspectives of participants involved [17].

While doing a literature review, a clear trend is observed. The literature on the study of the effect of perception, in addition to the general presentation of the phenomenon, can be classified into two distinct, well-separable groups. A group of works examining the topic has raised the importance of perception in doing research on risk management. Wang et al. (2016) examined the influence of personality and risk propensity on risk perception along four proven hypotheses related to risk perception (personality vs. perception) [18]. Wu et al. (2019) assessed the perceptions of risks as well. They introduced the relative importance index analysis and examined the internal consistency analysis involving Cronbach's Alpha [19]. Gürcanli (2015) investigated risk perception with the likelihood and severity assessments of the participants. The paper claims that employee participation and the perception of safety risks could be valuable for determining and eliminating hazards. It evaluates the risk perception of construction equipment operators. [20]

Another well-distinguished group of articles focusing on stakeholders introduced the phenomenon of perception. Davis has addressed the relationship between stakeholders and perception in several publications (e.g., [21]). Davis demonstrated that success depends on stakeholders and perception, and it changes over time. Also, a method to measure success dimensions relating to individual stakeholder groups was developed. Success is related to the multiple stakeholders, and to project structure. New success dimensions are linked directly to the perception of project success. Stakeholder perception influences the perceived project outcome as a success, and others demonstrated that the time point used to analyze success could change the outcome to perceived failure. Three stakeholder groups identified were investigated to evaluate why perceptions of success dimensions differ. McLeod et al. (2012) investigate how project outcomes are subjectively perceived in one IS case study project by senior management and the project core team [22]. A project can be perceived as successful by one stakeholder and a failure by another, but the stakeholder who evaluates it provides the final judgment. Turner and Zolin (2012) recognized that projects have various stakeholders and that perception can change over time, so the project manager needs to address this. Stakeholders have different perceptions of the success dimensions because they focus on factors related to the criteria they perceive as important [23]. Failure can be a result of different interpretations of the criteria and factors used for success by multiple stakeholder groups [24]. Failure is a result of different interpretations of the criteria and factors used for success by multiple stakeholder groups. There is no recorded theory to determine project success within the project management literature, which includes both the perspective of multiple stakeholder groups and the shared use of success dimensions for a given project. Studies were focusing on evaluating on how senior management, project core team and project recipient stakeholder groups perceive project success [25], [26]. Turner and Zolin (2012) proved that stakeholders could have different perceptions of success criteria because they will focus on factors related to the criteria they perceive as necessary [23]. There is no significant discrepancy between the perceptions of different stakeholders about the sustainable project risks [27]. Rafindadi (2014) concluded to the opposite of the hypothesis, which was that different stakeholders would prioritize risk sources differently, the findings suggest there is no significant discrepancy between the perceptions of different stakeholders about the sustainable project risks. A conclusion is that although different stakeholders might define goals and success on projects differently and they are engaged in different project life cycle phases, they all share the perception of the sources of highest risks within phases.

Maddaloni and Davis (2018) investigated the project manager's perception of the local communities' stakeholders in megaprojects [28]. It is on how the local communities' stakeholder is perceived, defined, and categorized by project managers. Zhao (2016) investigated stakeholder perceptions of risk in construction and found that there is a discordance of risk perceptions among critical stakeholders [29]. Ramos and Mota (2014) demonstrated that there are differences of opinions and perceptions among stakeholders as well [30]. The management of a project and its success are not directly related [31]. Poor communication among stakeholders, managers, and the project team causes a project serious problem. Bryde (2008) realized a positive correlation between project sponsor activities and perceived levels of project success (project outcomes) [32]. Goodenough et al. (2017) provided a review of stakeholder management performance attributes in construction projects and presented the diverse perspectives of what should be regarded as 'construction project success' exist. The diverse needs, interests, and objectives of stakeholders are expected to be fulfilled in the project to contribute to satisfaction [33]. Mei-Yung Leung et al. (2008) measured construction project participant satisfaction. There is a significantly positive relationship between commitment and satisfaction in construction project management, while a high level of conflict is stimulated in the goal-setting process amongst the participants [34].

Now it is evident, the topic of perception has emerged indeed in the project management literature. Approaching it from the risk management side, on the one hand, and from the stakeholders on the other hand. There is a lot to research, to analyze in terms of perception, with which we could implement a higher level of managing projects, and with which we would have a better understanding of project management processes.

#### **4. Data analysis**

To answer the research questions, we conducted a questionnaire survey, which was completed by a total of 114 responses, of which 111 can be used for research purposes. The main focus of the research is on projects where one of the participants feels that although the project may perform well on the basis of traditional project evaluation criteria (total project time, budget, and compliance), it seems to one or more project stakeholders that it is not successful.

The first question was, therefore, whether the project has a participant who perceives success differently from the others. Because we conducted a targeted survey in this regard, two answered 'no' to the question, and one respondent did not want to answer. Data collection lasted from early November 2019 to early March 2020. Current research is fundamentally exploratory, targeting an unidentifiable population. The sampling procedure was snowball sampling of nonprobability sampling, which is not statistically representative sampling, but given the topic of the research, a representative sampling method would not be appropriate. Descriptive statistical processing of the responses shows that we have managed to reach a relatively wide range, from small and medium-sized companies to large companies, and from small projects of 1-9 people to large projects employing more than 250 people. We believe that the sample is suitable for the analysis of the research question, and the study of the phenomenon of perceptual overwriting or dominance. Considering that we want to examine an issue that is not precisely defined, unknown or not interpreted in the same way even among professionals, we already placed great emphasis on the explanation and precise identification of concepts in each question when preparing the questionnaire, and we also asked whether the questions were understandable to the respondents or not. Based on the textual answers, it seems that the respondents understood the questions, they also know the phenomenon they want to explore. This is also supported by the item analysis of the responses to the assessment of the subjective success of the projects.

Based on the project literature, we identified ten actors, from the customer to the project members, through the project manager to the influencers, whose opinions were measured on a Likert scale ranging from 1 to 5 about the given project. The Cronbach's alpha value for the answers to these questions is 0.91, which is above the generally accepted range of 0.7 to 0.85. This indicates that the responses are consistent; however, a value above 0.85 also indicates that there is a risk of redundancy. The evaluation of the 10 participants is not independent of each other; there may be a close relationship between the evaluations of two or more participants. We classified the project participants into groups according to their opinion.

These groups are expected to develop according to the roles they play in the project, whether it is an internal or an external stakeholder, customer or performing organization of the project, or even it has a financial interest in the success of the project, etc. In addition to the previous analyses, which were typically one-variable descriptive statistical characterization of the answers to each question, as well as the examination of the relationship between the qualification criteria with the chi-square test of independence, we plan to use multivariable exploratory statistical methods for further analyses. With this statistical analysis process, we can get an answer to the connections between the evaluations of the project participants, as well as to our basic hypothesis that the difference between the traditional project evaluation indicators and the subjective evaluation of the participants really exists and can be statistically justified. For this, we primarily use hierarchical multivariable regression analysis, factor analysis, and agglomerative clustering.

## 5. Conclusion

According to the traditional approach, the most important set of indicators for the project managers are the time-cost constraints with the goal achieved in the right quality. Researchers and experts try to find and answer the most critical questions relating to the success of projects. This paper gave a summary of how the traditional success approach evolved and how the researchers tried to extend the basic model. A research goal on the possible dominance and effects of the factors come round. In conclusion, the possible mathematical-statistical tools supporting the research goals were developed and presented. After the statistical analysis, we group the project participants based on their opinions about the project, and we compare the opinions of these hopefully independent and homogeneous groups with the traditional project evaluation aspects. In the case of successful group formation, and if the phenomenon of perceptual overwriting can be verified in a statistically justified way, we plan to create a model that can be used to judge which participants' opinions are decisive in assessing the success of a project, and which subjective opinion of the given participant is most influenced by the objective factors.

We hopefully can get closer to the area of research on the success that has not been explored so far. This article review enables a future analysis for understanding better the success of projects.

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