

Critical Success Factors in Project Management: A Comprehensive Review^{1, 2}

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Abstract

There is an increasing interest in project management studies since more companies become project-oriented and apply project management principles in building their strategic business models. Project management is a broad subject with different knowledge areas that embrace variety of issues a project manager, a team, organizations and experts have to deal with to succeed in project implementation. When we talk about concept of project success, primarily there are two project success concepts: project success and project management success. Many researchers and professionals try to define the correct meaning of project success and project management success, yet it is challenging to make a strong difference between them due to their mutual nature. It is quite interesting to observe how the concept of project success have been developed through history, what kind of models were emerged and what methods researchers used to find the factors that lead to a project success. This research aims to provide a comprehensive literature review related to the concept of project success factors by studying different views, models, theories and approaches to gain better understanding on this issue, what methodologies are used in previous studies and what are further considerations in project success factors theories. This article provides a survey on ideas, knowledge, and principles to explain the project success by means of analyzing various techniques and to insert findings as a part of research design of PhD dissertation. It helps to get more precise and clear idea on the chosen topic and serves as a tool to proceed the work in progress at data collection stage. Apart from personal application, this review facilitates project managers to use obtained knowledge in practice in order to understand the relationship between project success and project efficiency.

Key words: *project management, project success, factors, efficiency.*

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Introduction

Probably every project manager wishes of successful implementation of projects. Usually literature differentiates between project success and project management success. Since these two concepts have mutual nature, there are still some similarities as well as differences.

In general, project success delivers established goals or objectives of the project while project management success is evaluated based on the traditional approach of project triangle namely cost, time and budget.

Over the years of studying success concept and project performance several extensions were brought to the traditional understanding. Success criteria evolved and developed according to project's perception and perspective of key stakeholders. Previous works on project success or project management success were not limited only by traditional approach but examined different aspects of success as human factors, knowledge transfer, stakeholders and perception concept, communication and advanced considerations.

This article aims to contribute to knowledge and practices of project success concept and provide a broad overview on this topic by analyzing different views, theories, opinions, investigations. The paper consists of several parts: first part deals with traditional approach of project success and project management success, and then few upgrades to the traditional concepts are given followed by detailed overview on numerous aspects of success. Later detailed literature review on critical success factors is provided and conclusions on these topics are made.

This work serves as a tool to build theoretical framework for future PhD research and facilitates to form a research design according to existing trends and knowledge in project management practice.

Project success and project management success

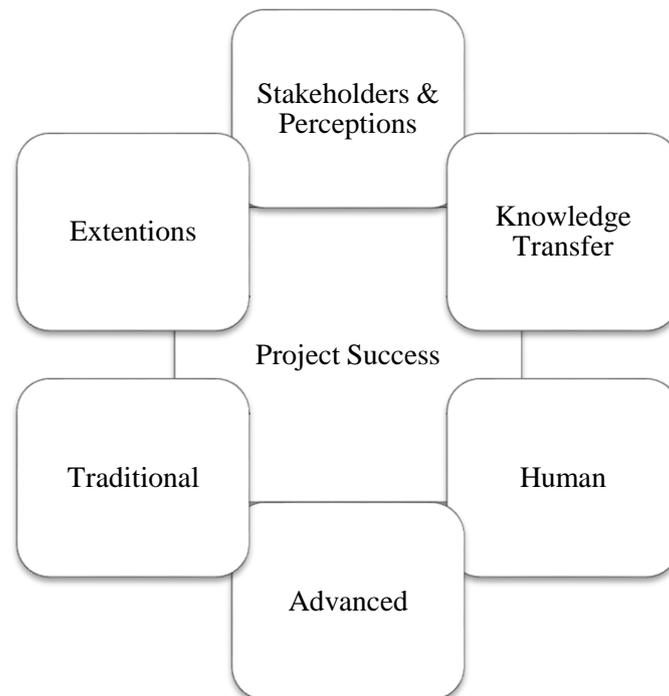
Usually when project managers evaluate project realization, they generalize project outcome by the word "success". However, literature usually distinguishes between two concepts: project success and project management success. De Wit (1988) was the first one who suggested this distinction. Undoubtedly, successful project management makes successful projects (Sebestyen Z.). Although poor project management still can make project successful. Munns and Bjeirmi (1996) shared similar ideas and noted that "a project can be a success despite a poor project management performance".

Typically, project success relates to the achievement of project or company's goals and objectives, while project management success commonly refers to the traditional measurement factors of project triangle – cost, time and quality (Radujkovic M.). Sometimes in relevant literature it is called triple restriction. Cooke-Davies (2002) distinguishes between project management success that leads to the desired objectives within stated time and cost, and project success where project delivers the business

objectives. Generally, there are various models and views on project success and project management success and it is quite difficult to find a right definition between these two fundamental concepts because of their similar nature. Cooke-Davis integrated in their research elements that lead to consistent, sustainable success (Sebestyen Z.). Despite of the attempts to find the right definition of what are the elements of project success, many researchers agree that project manager's good combination of actions contribute to project success (Radujkovic M.). In their work Williams et al. (2016) evaluated project success in two fields: customer satisfaction and client relationship quality in project management (P. Williams). Project management creates tangible and intangible benefits of organization that is why it is hard to find exact project management evaluation. The importance of perception also takes place while assessing project's success.

Traditional PM triangle was the first model of project management success. It appears in every definition of project. However, many researchers find this approach not sufficient to assess project success. These factors were observed later only as a part of project success (Radujkovic M.). One of the most important ideas is that project triangle should include factors that create and transmit value. Reich, Gemino and Sauer (2010) mentioned in their work that a final goal of project manager is to create a business value (Exploring the impact of knowledge management on business value on IT projects, B.H. Reich). There are many other approaches of project management success like integration, scope, human resources, communication, risk and procurement management. Morris and Hough (1986) mentioned four success factors, apart from time, cost and quality they introduced safety. Stakeholder's satisfaction, benefits to project's owner-organization and long-term impacts on project environment (Radujkovic M.) can be considered as part of success as well. There are several thorough empirical researches related to the evaluation of project success through stakeholder approach. They state that each group of stakeholders (customers, senior management) consider the project success from a different perspective. In order to measure the project success the diversity of stakeholders interests should be included.

Due to further considerations of project success, more complex system of factors was developed. Researches felt the need to introduce another factors or elements to the traditional perception of project success. Thus to extend the basic evaluation criteria several groups of critical success factors are presented according to existing relevant works (Fig. 1).



Source: author's construction derived from the literature

Fig. 1. Aspects of success

Stakeholders

Stakeholders have different understanding and perceptions of success. Interestingly that at the end of 20th century the idea to consider stakeholders to evaluate success appeared in literature. (Further Considerations in Project Success, Zoltan Sebestyen). Turner and Zolin (2012) mentioned that project success is best judged by the stakeholders, especially the primary sponsor.

In their research Collins and Baccharini (2004) stated that the satisfaction of owner's needs is the most important factor in project's success (Project Success – A Survey, A. Collins). Bryde and Robinson (2005) proved the same statement and mentioned that for contractors cost and time play most important role. With the increasing interest to the point of project management success through stakeholders' fulfillment, few fundamental papers were published on this topic. Initially customer as a single stakeholder appeared in the works, later some authors investigated communication with the customer as critical success factor (A retrospective look at our evolving understanding of project success, K. Jugdev, R. Müller). Hyvräri (2006) defined communication as the main factor contributed to project implementation. Munns and Bjeirmi (1996) stated that most of the projects ends when they reach their customers (The Relationship between Project Success and Project Efficiency, Pedro Serrador, J Rodney Turner).

Communication

It was indicated earlier in this work that many researchers define communication as one of the critical factors in assessing the project success. Pinto and Slevin (1988) defined several factors that contribute to successful implementation of several projects namely project schedules/plans, client acceptance, monitoring and feedback, communication, trouble-shooting, and characteristics of the project team leader. To support this point of view S. Brown and K. Eisenhardt discussed in their study that process, communication, and interpersonal relationships (trust, respect) influence on project success. Findings demonstrate that communication in large companies considered as the most important critical success factor, while small companies evaluate it as the most critical one. Andersen et al., (2006) in their research derived nine critical success factors: communication, planning approval by stakeholders, formal and well-structured approach, commitment to the project, influence of stakeholders, understanding and accepting the proposal, restrictions, flexibility in the execution, and influence over the project processes. In this case, communication was perceived as a great contribution to trustful relationship between project participants, also as a crucial aspect of providing long-term benefits to stakeholders and of procedures and processes that support the activities.

Apart from traditional specifications of success, Verma (1995) pointed that success is a function of communication, teamwork and leadership (V.K, Verma, *Organizing Projects for Success*). He also developed the idea of perception of project performance in his works. Since project success depends on the perception of stakeholders, there is mostly “perceived success” rather than “absolute or ultimate success” (*Improving project success: A case study using benefits and project management*, Jorge Gomes, Mario Romão).

Knowledge transfer

There is another approach that is less discussed among academics yet there is a growing popularity and need to include the concept of knowledge impact on project outcome. Knowledge can be transferred between individuals, teams and organizations. Authors define knowledge as “a process of learning from previous projects through an interactive exchange of experiences”. Ayas noted that the ability to access experience guarantees continuing improving and create business value.

Knowledge is considered as “mind” of organization and the process of effective knowledge transfer becomes essential for successful outcome of the project (*Effective knowledge transfer in successful partnering projects*, Alessia Bellini, Wenche Aarseth, Ali Hosseini). Several authors dedicated their works of studying the factors that affect positively on knowledge transfer. Hajidimitriou et al. and Chen et al. noted trust as an important key element for effective knowledge transfer. According to Yew Wong trust between the project participants enables the creation of knowledge-transfer environment. Among other key elements team work, communication, meetings, supportive organizational culture and location of project participants support effective knowledge transfer. Despite the obvious importance of knowledge management in

projects many researches recognize it as a challenge to companies (Anantatmula, 2010; Lindner & Wald, 2010; Boh, 2007; Bresnen et al., 2003; Schindler & Eppler, 2003; Disterer, 2002; Kasvi et al., 2002). According to T. Johansson et al. (2012) understanding of the roles within the knowledge transfer process is essential because business benefits of project management are only achieved when knowledge is transferred between employees.

Human

Many researchers realized the importance to include human assets in success criteria since there were limited studies on human resource in project management (Fabi and Pettersen, 1992). However measuring the impact of human factor is on project performance is not an easy task since it is difficult to quantify it. Authors started introducing in their works such concepts of human factors affecting success as flexibility, adaptability, enthusiasm, spontaneity, aggressiveness, confidence, initiative and leadership, ambition, verbal abilities.

The Standish Group 2000 study and other works stated that human factor is perceived as the most influential factor that causes failure or success (Johnson et al., 2001; Kor & Wijnen, 2001; Schein, 1995; Storm & Jansen, 2004; Turner, 1999). Except studies on business cases or organizations, several studies on education were conducted. Many authors in their works noted that process aspects are dependent on human factor, which is described as management competence. Several authors indicated that number of projects failed because of incompetent leadership or management, lack of support from senior management or other person in charge, lack of support from peers or organization.

Human assets as success criteria found their place in the works of many authors. Thus Liphadzi et al. (2015) revealed correlation between leadership styles and project success. Yang and his co-researchers examined the relationship between international character of the project and leadership style and success, apart from considered teamwork, project type, industry sector, team size and etc. The paper on “Critical success factors in project management: implication from Vietnam” states that the social-cultural, political and economic context of a project is critical in understanding what is successful, particularly in developed countries, but it is largely ignored (Cao Hao Thi and Fredric William Swierczek, 2010).

Human factors do not only affect project performance but they have impact on client satisfaction and project acceptance (Procaccino and Verner, 2006). There is a positive connection between project manager, team competences and project performance. All these studies developed more interest of success criteria and led to new approaches towards investigation of project success.

Advanced aspects

Since topic on project success turns to be more complex and uncertain there are still many areas covered partially by investigators compared to others. As it was stated

earlier in the paper Cooke-Davies pointed factors that lead to the sustainable success. Mishra, Dangayach and Mittal (2011) evaluated ethical standards as critical factors towards sustainable project success. Yang, O'Connor and Wang (2006) studies the technology-intensive level of project.

According to M. Radujkovic (2017) there are several areas for future project management studies including project management competences and effective way to use them, since project manager and project team are the most responsible people of project success: relationship between project and parent organization because the accessibility to project-oriented environment create greater chances to succeed; developing, adapting and adopting project management tools, methods and techniques in order to optimize planning, monitoring and control processes. Joslin and Müller (2015) identified that applied project management methodology has an impact on success.

One more aspect that will find future application is the analysis of links between partnering and knowledge transfer. Several authors recognized that partnering success factors, like collaboration, mutual trust, and open communication, are directly related to effective knowledge transfer. It shows that knowledge transfer and partnering have mutual effect on each other.

Defining Critical Success Factors

Authors mention in their works that project managers contribute in case they have good knowledge of project success factors and their controls (Andersen, 2006). Studies show that in each management process, practices related to factors that influence project success vary from company to company (Nogeste, 2004; Nogeste e Walker, 2008). Despite the numerous studies on project success factors there are still very limited empirical facts related to the identification of the project success factors to the successful project management (Success Factors in Project Management, Élen Nara Carpim Besteiro, Jefferson de Souza Pinto and Olívio Novaski, 2015). Fortune et al. (2013) in their research stated that success factors are part of strategic perspective and several influencers are derived from the expectations of the stakeholders. Élen Nara Carpim Besteiro et all in their research indicated that the factors under the direct control or influence of the company facilitate the success of project management. Control is the one in accessibility of a project manager. Therefore, the benefits are in understanding the factors that need be monitored (Elen Nara Carpim Besteiro, Jefferson de Souza Pinto and Olívio Novaski, 2015).

The other literature says that the criteria for success evolve constantly, creating an ongoing challenge for industry professionals. In such a situation, the development of a strategic framework that tactically deals with project success and the identification of critical success factors (CSFs) is an important starting point. D. Milosevic and P.Patanakul (2005) described CSFs "as characteristics, conditions, or variables that can have a significant impact on the success of the project when properly sustained, maintained, or managed (Standardized project management may increase development projects success).

Dvir et al. (1998) argued that success factors should not be universal to all projects. To define success factors, a different approach is necessary to develop an improved framework that can include these widely diverging views. Lim and Mohamed's framework (1996) suggested two levels of critical success factors. First level (micro level) included time, cost, performance and safety as Morris and Hough previously mentioned. Second level (macro level) consisted of total project time, satisfaction during the use and operation of the final product.

According to Pinto and Covin (1989) at early project stages there are internal factors like budget, schedules and technical performance, while in later stages of a project external factors as customer needs and satisfaction are considered to be more important.

Many authors agree that evaluation of project success differentiate according to the evaluator and it should use multi-dimensional, multi-criteria approach (Cooper and Kleinschmidt, 1987, Pinto and Mantel, 1990, Freeman and Beale, 1992). The following Table 1 presents several approaches on identifying critical success factors according to project's objectives and perception.

Table 1.

Critical Success Factors

Author	Year of Publication	Success Factors
Pinto and Mantel	1990	Implementation process, perceived value of the project, client satisfaction with the final product
Paolini and Glaser, Pinto and Slevin	1977 1988	Customer welfare
Freeman and Beale	1992	Technical performance, efficiency of execution, customer satisfaction, personal growth, organizational ability, business performance
Kerzner	1998	Cost, time, technical performance, customer acceptance
Belassi and Tukel	1996	External environment, project manager and team members, organization, project
Schultz et al.	1987	Strategic: project mission, top management support, project scheduling; Tactical: client consultation, personnel selection and training.
Cooke-Davies	2002	Project team and management competencies

Source: author's construction based on the literature review

Based on the literature review success factors are usually expressed as general factors including “iron triangle” or very specific factors relevant only to a particular project or organization (Baker, Murphy and Fischer, 1983; Cleland and King, 1983; Finch, 2003; Pinto and Slevin, 1987). Due to project’s nature, objectives and perception critical success factors change accordingly. Pinto and Prescott (1988) investigated critical success factors over the project life cycle. They concluded that relative importance of several critical factors change significantly based on the life-cycle stages (I. Hyväri, 2006).

There is evidence that shows the need to understand priorities of different success factors according to project phases, project’s objectives, and influence of managers, communication, control and learning.

Conclusions

Project management practice is a broad field that includes numerous topics for debates. This paper provided a general overview on the success concept with particular emphasis on the development of traditional approach and understanding of project management critical success factors existed in the literature today.

We can conclude that the perception of the term success changed significantly over years. It is obvious that since there is an increasing number of project types and penetration of project management to different spheres and industries there is a need of studying and introducing more critical factors.

Due to more complex, uncertain and demanding nature of projects nowadays, yet research is seeking for the right indicators of success. This summary focuses on small section of success concept and there are many other uncovered areas like project knowledge management, human resources in project management and application of certain tools and methodologies in project management expertise.

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