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## Project Management Success I-C-E model – a work in progress

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### Abstract

Project management in software development has shown high rates of failure since the beginning of computation. Over the last years, several studies have sought and proposed solutions for this problem by focusing, for instance, on success critical aspects and evaluation criteria. Although these efforts have provided a significant evolution in how the work is done, project management success rates are in fact still well below the desirable values. This paper presents a work-in-progress based on an integrated approach to project management success and proposes a model that considers jointly the set of success influencers, project characteristics and evaluation criteria of success, from the initiation of a project until its closure.

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## 1. Introduction

Software development projects continue to be marked by significant rates of failure [1, 2]. This reality has attracted the attention of many researchers and organizations around the world which, in recent years, have reported project results in terms of success (e.g. [3], [4], [5]). The Standish Group Chaos Report [6, 7] is a paradigmatic example of this kind of study.

While attempting to contribute to solve this problem, several studies have identified possible causes of failure and proposed solutions to overcome them. As examples, the following studies can be mentioned: El Eman and Koru [1] identify the most common causes of problems raised in projects management that may lead to its cancellation; Chow and Cao [8] describe the critical success factors in agile software projects; Belassi and Tukul [9], to ensure project success, propose a framework to identify critical success factors; Reyes et al. [10] propose the use of genetic algorithms in software project for probability success optimization; Dekkers and Forselius [11] advocate an information technology projects success rate increase with a more precise management scope.

Despite all these efforts contributed to a significant evolution in the way the work is performed, results of project management are still, in too many cases, well below what is desirable [1]. This paper presents a work-in-progress that is based on an integrated approach to project management success and proposes a model to be considered at all stages of the project management life cycle, aiming to become a contribution to overcome the aforementioned issues.

The remainder of the paper is structured as follows: in Section 2, a brief literature review of studies that have focused on the success of projects is presented. Then, a preliminary version of a model that considers jointly influencing aspects, characteristics and evaluation criteria of projects is presented in Section 3. Finally, conclusions are drawn in Section 4.

## 2. Background

As previously mentioned, several studies, in recent years, have focused on studying the success in software development projects, as well as in other areas, identifying aspects that somewhat influence or constrain its achievement. Some examples are the studies of Clarke [12], Verner et al. [13], Khang and Moe [14], Clarke and O'Connor [15], Drew et al. [16], Lim and Mohamed [17], Agarwal and Rathod [18], Shenhar et al. [19], Müller and Turner [20], Davis [21], McLeod et al. [22], Savolainen et al. [23] and Muller et al. [24].

Clarke [12] focused on the critical success factors, identifying: communication throughout the project; clear objectives and scope; breaking the project into 'bite sized chunks'; and using project plans as working documents.

Verner et al. [13] presented factors that lead to project failure. After analyzing several failed projects, they figured out that factors that may lead a project to fail are very diverse. Notwithstanding, among them the four most common have been identified: delivery date impacted the development process; project was underestimated; risks were not re-assessed, controlled, or managed through the project; and staff not rewarded for working long hours. The guidelines which correct the failure factors were also presented by the authors.

Khang and Moe [14] have identified criteria and success factors in international projects and have developed a framework based on critical success factors adapting them to international projects' characteristics and context.

Clarke and O'Connor [15] referred situational factors that affect the software development process.

Drew et al. [16] have identified factors for preliminarily predicting the software development success.

Lim and Mohamed [17] analyzed the considered criteria when evaluating the success of a project and have differentiated the "criteria" and "factors" concepts. Criteria are the set of principles and standards by which

judgment is made, whereas factors are the set of circumstances, facts or influences contributing to success. The authors proposed two categories to classify a project's success: the micro viewpoint and the macro viewpoint.

Agarwal and Rathod [18] provided a definition of "success" in software projects. They studied the standpoint of internal stakeholders (programmer/developer, project managers and customer account managers) in relation to the project success evaluation criteria. They concluded that the "scope" of the project is the main success criteria, which comprises the functionality and the quality of the final project.

Shenhar et al. [19] referred that "success" may have different meanings depending on people, circumstances and project. Their analysis identified four key dimensions of success: project efficiency; customer impact; direct impact on business success; and future adequacy.

Müller and Turner [20] studied the project manager influence in success criteria definition. The study revealed that the imputed importance to project success criteria and the success rates differ depending on the industry, project complexity, and age and nationality of the project manager.

Davis [21] stated that different stakeholder groups may have a different perception of the project success. The proposed study divided the stakeholders into three groups (senior management, project core team and project container), and concluded that there is a lack of agreement on the perception of the success factors.

McLeod et al. [22] also presented "success" based on different perspectives and developed a framework that can be used by project managers to recognize and understand that the project evaluation is an emergent, multidimensional and subjective process. The possibility of multiple perspectives, and therefore various evaluative judgments, could be usefully applied by project managers for planning, managing and conducting formal project evaluations.

Savolainen et al. [23] presented a success perspective of software development projects from the supplier's point of view. The authors found three main criteria based on an exhaustive search of scientific papers related to the success of software development: customer satisfaction; customer business short-term success; and long-term success.

Muller et al. [24] identified a relationship between project success and leadership.

The set of studies referred above illustrates the great interest that the theme "success" has generated in the scientific community and reveals the actual importance of this area in project management practice and study.

### **3. Project Management Success I-C-E (Influencers-Characteristics-Evaluation) model**

Although other criteria may and should be considered [25], the three main criteria that have been used for success evaluation since the beginning of software development projects are: budget compliance; meeting deadlines; and meeting scope. These criteria have been strengthened by the debatable vision over time [2] of the Standish Group Chaos Report [6, 7]. Nevertheless, it is important to note that, for example, if, at the end of a project, the customer is completely satisfied with the results, even if the deadline or the budget have not been met, the project's success will be higher in comparison to a project which has met all the traditional criteria (scope, time and budget), but the customer is unsatisfied with the results. This idea is reinforced by the fact that the relative success achieved in the project may be intrinsically linked to the various stakeholders perspective [21].

To enhance the overall success of project management, a range of factors that influence success, the project characteristics, as well as the criteria used in the success evaluation, must be considered jointly. Thus, in this (work-in-progress) study, it is proposed an integrative model to support project management activities, which, in a combined and explicit way, cover the various complementary aspects that contribute to the overall success of a project. A preliminary version of this model is depicted in Fig 1.

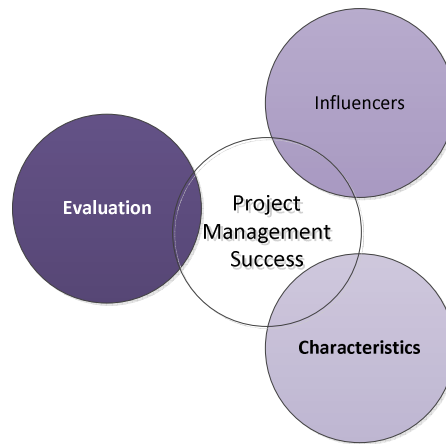


Fig. 1. Project Management Success I-C-E (Influencers - Characteristics - Evaluation) model

In the proposed model, all project and management aspects that can affect the success are designated by influencers, whereas characteristics are project aspects that can facilitate or constrain their execution. Regarding the evaluation criteria, they are the aspects used to assess the project management success. Some examples of key influencers which determine success are: clearly defined project objectives; top management support; user involvement; proper planning; and competent project managers. Examples of project's characteristics are: the project objectives; the expected deliverables; the existing constraints; and the available resources. Finally, regarding the project evaluation, the criteria typically used are meeting the deadline, the budget and the scope. However, other criteria such as customer and user satisfaction are also important.

These various aspects should therefore be considered in a holistic and integrative perspective throughout the different stages of the project management life cycle: initiation; planning; execution; control and monitoring; and closure.

Since this is a work-in-progress, aimed at detailing the preliminary model presented, there are studies being made on each of its dimensions and constituents, as well as on the correlations that may exist between them.

#### 4. Conclusion

Software development projects have been marked by success rates well below what would be desirable and failure continues to persist even with the many studies that have attempted to come up with solutions to this problem. In this paper, the preliminary ideas and perspectives of an ongoing research were presented and an integrated approach, regarding various relevant aspects in the context of success project management, was introduced. This is reflected in the draft model presented, where influencer's aspects, project characteristics and criteria for project management success evaluation, are considered together throughout all the activities in the project management life cycle. In the future, studies on the different dimensions of the model and its empirical corroboration will be developed.

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