Identification and Quantitative Analysis of Project Success Factors for Large Scale Projects

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ABSTRACT

Software projects require a right mix of the software resources and the expertise to increase the chances of timely completion. The interface for the resource allocation to the software projects is provided by the project factors. The identification of the comprehensive project factors for the diversified nature of projects in itself is an open research area. This paper is based on a quantitative study that helps in identifying the prominent software project factors for large scale projects. The paper then, as a result provides a list of project success factors and provides the statistical evidence to support the result of the survey.

1. INTRODUCTION

Software project factors also called project success factors are used as an interface to allocate resource to a software project. A literature study was conducted in this regard to identify the most common project factors. Schoeffel and Pablo (2012) have mentioned that there are only three valuable factors in any successful projects to be considered, cost, effort and quality. The author has also proposes SMART techniques to make a project successful. Nasir et al. (2006a) has stated that there are five factors in estimating the project, namely time, effort, cost, resources and specifications. This authors have also focused on the effective balancing between the cost, time, space, effort and resources. The authors have suggested that an abstract level of estimation as detail bound estimations may lead to wrong results. The author further suggest that an effective balancing mechanism be in place for utilizing the increasing resources as after some increase the resource utilization decreases. For skills the author focus on having the right skills instead of just having the skills to increase the productivity of the teams working on the project.

Schmidt (Schmidt, Lyytinen, Keil, & Cule, 2001a) and Keil (2002) have observed that Requirement change, availability of re-usabe code, cost, time and team size are all valuable factors for a software project. Taylor (2006)
believes that requirement change, team and time are enough to be considered as the project factors. Hashim et al. (2013) has identified that Computational resources, Requirement change, Time and Team size are the factors to calculate the scale and complexity of the software project. In a report, published by Standish Group (Group, 2012) and Hashimi et al. (2012) it was mentioned that the Computational resources, Requirement change and Team size are sufficient to identify the project estimates while some alike investigations can be found in A. M. S. Basit Shahzad (2012), Iqbal and Shahzad (2006), S. Al-Mudimigh, Ullah, and Shahzad (2010), Shahzad, Al-Mudimigh, and Ullah (2010a), Shahzad and Saqib (2005), and Shahzad, Ullah, and Khan (2009).

Berghout (2013) identified that Requirement change, Cost and Time are the factors that are needed to be there for estimating the required resources for the project. De Carvalho (2013a) elaborates that there are only two project factors, namely Requirement change and Time. Keil (2012), Murthy (Murthy, Kumar, Sharma, & Kiron, 2011) and Nuseibah et al. (1997) believe that the ‘Requirement change’ is the most important factor to be considered as a project factor. Baccasini et al. (2004) and Standish Group (Group, 2012) have emphasized that Computational resources, Requirement change, Cost and Team size are among the most valuable project factors. Chiang (M. F. Chiang, et al., 2013) has mentioned Requirement change, Cost and Time as the most important project factors while Boehm (2009) has also given value to Team size along with the Requirement change, Cost and Time. Callegari et al. (2007) has advocated the presence of Requirement change and Cost as project factors while Taylor (2000) has mentioned ‘Requirement change’ and ‘Need for documentation’ as considerable project factors. Lam (Basit Shahzad, Abas Md Said, & Aziz, June 2014; S. L. Lam, et al., 2013) considers that Requirement change, Cost, team size and Need for documentation are among the most important project factors. Wiengarten et al. (2013) and Murer (Murer, Bonati, & Furrer, 2011) have advocated the importance of Requirement Change, Cost, Time and ‘Need for documentation’ for being the valuable project factors while McLeod. (McLeod & MacDonell, 2011) believes that along with these four factors ‘computational resources’ must also be considered. Perkins TK (2006) advocates that ‘Team size’ is among the most valuable project factors. Jones (C. G. Jones, Gray, & Miller, 2010), Drevin (Drevin & Dalcher, 2011) and Aarts et al. (2011) consider that Cost, Time and Team size are very essential project factor while Beyonan also adds ‘Computational Resources’ in this list as well.

Sauer C. et al (C. Sauer, 2003) have identified the Cost and Time as project factors while Schmidt (Schmidt, Lyytinen, Keil, & Cule, 2001b) believes that Time and Team size are more important. Abdullah et al. (Abdullah & Verner, 2012), Charatte RN (Charette, 2005), Tsunoda et al (2013), Wilkerson (Wilkerson, Nunamaker Jr, & Mercer, 2012) have identified that Time is the most important factor to be considered as the project factor. Lam (S. L. Lam, et al, 2013; Montini et al., 2014) Denis and C. Jones (1996) advocates the importance of ‘computation resources’, Cost and Time as the project factors while Milisk et al. (Milis & Mercken, 2002) argues that ‘Computation resources’ and ‘Team size’ are also among the valuable risk factors. Leveson NG (2004) believes that the ‘Computational resources’ is the most important project factor. Karg LM (Karg & Beckhaus, 2008) and Robillard (Robillard, Lavalle, x, & e, 2012) have identified ‘Quality focus’ while Chow T (Chow & Cao, 2008) has identified ‘Need for documentation’ as most important project factor.

Lam et al. (2013) have performed a study about the critical success factors that include the theoretical guidelines about a successful project. The authors have focused to describe the improvement standards in the software process. They have also brought critical success factors of the project success into consideration and have included: budget and estimation, documentation, tools and technology and quality in this domain. The authors have also brought critical success factors of the project success
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