ORIGINAL RESEARCH PAPER

Engineering

ANALYSIS OF SOFTWARE FAILURE FACTORS AND CRITERIA TO INCREASE THE SOFTWARE QUALITY

KEY WORDS:

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ABSTRACT

A current Analysis study on Software Industries indicates that the majority of software projects failures are big challenge to the Developers. These software failures are characterized by high budget, improper schedule, and failing to meet customer expectations. These characteristic factors take the organization to research regarding the factors that lead to software project success or failure. This paper presents a factors and methods for software project success. The factors included in these papers are from organizational, technical, people, and culture factors. The suggested factors and methods are not founding together in any of the previous similar works.

1. Introduction

Software Company has to produce very high-quality products to achieve a respectable position in the global market. In this era of globalization, things are changing and moving with great pace. To survive in this world of global competition needs efforts, money, people and time. It is very complicated to find mistakes and errors committed during the process as it involves cost, time and resources. Whatever is done should be considered as first and last time. To avoid such problem the organization should come up with major factors influencing the software quality of process and the product. There have been many incidences of failure in real time software system which led to serious consequences.

Figure 1 Software Quality factors

Many industries noticed that a number of their software projects failed; and between one and two-thirds of software projects exceed their budget and time. A project is usually deemed as successful if meets requirements are delivered on time and delivered within budget. Software quality is the overused term in the field of software engineering. It is meant to encompass all of the stakeholder needs and perspectives in terms of the delivered software product [5]. It is meant to include both objective and subjective technical evaluations. "High" quality is inherent, yet the vastly subjective goal of every software development team. A standardized approach to quantifying both the Elements of software quality and the factors that influence software quality is essential to providing insight into a software product that is consistent and reliable across applications.

The objective of this paper is to discuss the reasons for software project failures factors and to provide some directions for future research

2. Related Work

Identified key factors affecting the software quality process. Many authors have classified the various factors under specific domains. Some authors have suggested techniques like Inspection [4], Peer Reviews [4] useful for all phases of software development. Reconsider of documents and artifacts, coding documents, design documents are important for quality control activities. Inspection is quite useful for assuring quality in software development. Inspection helps for detecting and removing the errors. Revision is

sort of revising work in all phase. Revision builds confidence in the process. Some researchers have classified factors according to the influences. Some have classified them on basis of software development phases.

3. Research Methodology

We have tried to search journal and conference paper on Internet but could get limited papers from IEEE, Springer and ACM, Presently we identified and listed factors based on research paper available with us.

A. Searching and Selecting Papers

The main criteria for searching were journal, conference paper and other paper on factors.

Searching was done manually and also on internet.

B. Information Sources

We have searched and collected information from various sources which are listed in references
- www.acm.org
- www.ieee.org
- www.sciencedirect.com
- Springer Journals
- Elsevier Journals
- Conference papers

4. Factors affecting Software Quality

This section provides a software projects success/failure factors. In generally this factors are classified into four categories [8]:

Organizational Factors

The success of a software project is often related to organizational factors. Organizational factors are divided into four factors: the presence of formal methodology, clear business objective, executive support and minimized project scope.

Technical Factors

The success of a software project is often related to technical factors. Technical factors are divided into three factors: the presence of standard software infrastructure, understanding requirements and managing requirements changes and reliable estimates.

People Factors

The success of a software project is often related to people factors. People factors are divided into two factors: user involvement and the presence of an experienced project manager.

Culture Factor

The culture factor is a critical success factor in software project. None of these authors included this factor in their framework or models.

The failure factors are usually a combination of technical, project management and business decisions, and each dimension interacts with the others in complicated ways. Project managers (PM) and development teams must deal with many pressures from project stakeholders during the software development process. These pressures impact the effort, cost and quality of the software produced [9].

Table 1.Ways of failure factors Arise

S.No	Way of Failure Factor Arises
1	Organizational structure
2	Unrealistic or unarticulated goals
3	Software that fails to meet the real business needs
4	Badly defined system requirements, user requirements and requirements specification
5	The project management process, poor project management
6	Software development methodologies, sloppy development practices
7	Scheduling and project budget
8	Inaccurate estimates of needed resources
9	Poor reporting of the project status
10	Inability to handle project complexity
11	Unmanaged risks
12	Poor communication among customers, developers and users
13	Use of immature technology
14	Stakeholder politics
15	Commercial pressures
16	Customer satisfaction
17	Product quality
18	Leadership, upper management support
19	Personality conflicts
20	Business processes and resources
21	Poor, or no tracking tools

4.1 Software Factors and Criteria
Criteria are the characteristics which define the quality factors. The criteria for the factors are the attributes of the software product or software production process by which the factor can be judged [10].

Table 2.Software Factors and Criteria

Factors	Criteria
Correctness	Completeness, consistency, operability
Efficiency	Concision, execution, efficiency, operability
Flexibility	Complexity, concision, consistency, expandability generality, modularity, self-documentation, simplicity
Integrity	Audit ability, instrumentation, security
Interoperability	Communications commonality, data communality
Maintainability	Concision, consistency, modularity, instrumentation, self documentation, software independence
Portability	Generality, hardware independence, modularity, self-documentation, software independence
Reliability	Accuracy, complexity, consistency, error tolerance, modularity, simplicity
Reusability	Generality, hardware independence, modularity, self-documentation, software independence
Testability	Audit ability, complexity, instrumentation, modularity, self documentation, simplicity
Usability	Operability, training
Modifiability	Structure, augment ability,
Understandability	Consistency, Structure, conciseness. legibility
Documentation	Completeness
Functionality	Capability, security
Performance	Flexibility, efficiency, Reusability
Supportability	Testability, extensibility, maintainability, compatibility

4.2 Important Successful factor, Challenge indicators
According to the 1994 Standish CHAOS Report, These are the top 5 of 10 listed in the report. The report concludes that these were the elements that were most often pointed to as major contributors to project success. The failure elements are treated well, a project, according to the Standish Group, will have a much higher probability of success. The next category of differentiators from the Standish report deals with projects that proved to be "Challenged;" that is they were completed buy were over budget, over time, or not contains all functions and features originally required.

The top 5 factors found in successful projects
1. User Involvement
2. Executive Management Support
3. Clear Statement of Requirements
4. Proper Planning
5. Realistic Expectations

The top 5 indicators found in "Challenged" projects
1. Lack of User Input
2. Incomplete Requirements & Specifications
3. Changing Requirements & Specifications
4. Lack of Executive Support
5. Technical Incompetence

5. Conclusion
Our study shows that projects do not fail for one single reason alone; they fail for multiple reasons. These findings are in full agreement with Glass [9] who noted there are generally more than one or two reasons for a software project to fail, and it usually is a combination of several factors and project success is dependent on many factors including executive support, clear objectives, presence of a formal methodology, minimization of project scope, use of a standard software infrastructure, understanding and managing requirements, making reliable estimates, user involvement and presence of experienced project manager. Future research is needed to extend and improve the methodology to find the factors to improve and preventing the software from the failure factors.

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