Analysis of Factors that Leads to High Rate of Software Projects' Failure

Muhammad Faraz Chughtai[1] and Najmi G. Haider[2]
SZABIST
Karachi, Pakistan

Abstract *In today's world, Information System (IS) projects play a significant role in meeting business objectives. However, there is an alarmingly high rate of up to 80% projects that end in failure. The failure results in wastage of time and money, and prevents the businesses from meeting their goals. Hence it is required to determine the causes of projects' failure. The causes of failure are somewhat known but to identify the key factors by knowing how often they affect the software projects is paramount to remediate it.*

The objective of this study was to identify the key factors by determining their likelihood and suggest counter measures that may be useful to minimize the rate of failure. For this purpose a survey was conducted involving Project Managers/Tech Leads who have worked on various projects. Certain key factors were determined and respondents were asked to suggest the contribution of those factors in steering the project towards failure. Moreover, they were also asked to prioritize the key drivers among cost, quality, scope, and on time delivery which if properly managed would minimize the chances of failure of projects. Some useful conclusions were drawn on the basis of outcome.

Keywords: SDLC, Project Management, Risks, Change/Configuration Management

1. INTRODUCTION

Software projects play a vital role for creating value in the digital economy and organizations have grown more heavily dependent on IS to help them solve problems and overcome challenges in today's society [1]. As there are undoubtedly success stories in the IS field, the sad fact remains that many IS projects end in failure [2].

The Standish Group's "CHAOS Report," [3] a widely respected survey of software projects in industry and government, estimated that, in the year 2004, only 29% of software projects in large enterprises succeeded (i.e., produced acceptable results that were delivered close to on-time and on-budget). 53% were "challenged" (significantly over budget and schedule), and 18% failed to deliver any usable result. The projects that are in trouble have an average

budget overrun of 56%. This represents a serious and chronic risk-control problem [4]. The failed projects waste

businesses millions of dollars every year and often prevent key business objectives from being met [5, 6].

2. RESEARCH OBJECTIVE

The objective of the study is to determine the important factors having high likelihood of affecting the success of the project and can potentially lead the project towards failure. For this purpose, a survey was conducted involving the Project Managers / Tech Leads, based on the results of which key factors would be determined that plays crucial role in the high rate of software projects' failure. Moreover, critical project success drivers among cost, quality, scope, and on time delivery would also be assessed and based on the outcome some conclusions would be drawn that can serve as a guideline towards minimizing the high rate of failure.

3. SURVEY DESCRIPTION

There were around a dozen of Project Managers/Tech Leads from two well reputed IT organizations that participated in the survey having an experience between 4-8 years. The questionnaire containing close ended questions was e-mailed to them to obtain their responses. The questionnaire consisted of two parts:

3.1 What are the prime reasons of high rate of projects' failure?

First part consisted of 15 factors that can potentially drive the project towards failure. Respondent were asked to rate each factor on the following scale:

1- Yes, exactly
2- Yes, at most times
3- Yes, to some extent
4 -Yes, at least times
5- No, not at all

From top to bottom each option had its grade point from 4-0.

The factors included in the survey were:

F1. Use of improper SDLC practices

F2. Inappropriate project management practices

F3. Use of improper process models

F4. Inconsistencies in design

F5. Frequently changing technology

F6. Use of misfitting technology due to unavailability of expertise

F7. Lack of use of estimation techniques

F8. Improper change/configuration management procedures

F9. Ignorance of risks

F10. Project Managers/Tech Leads' incompetence and not being aware of the latest trends

F11. Incompetence of project staff

F12. IT service providers have usually no business domain experts for the projects hence targeting as-is rather than to-be model most of the times

F13. Avariciousness on the part of IT service providers to force unrealistic estimates

F14. Employees' turnover

F15. PEST (political, economic, socio-culture and technological) context in which the project is executed

3.2 Critical determinants for project success

Second part listed four key drivers of project success that respondents needed to be prioritize on the scale of 1-4.

The critical drivers included were:

a. On time delivery
b. Quality
c. Scope
d. Cost

4. ANALYSIS OF FACTORS THAT LEAD TO HIGH RATE OF FAILURE

4.1 Statistical Findings

Following is the graphical representation of the statistics obtained from the survey. On X-axis factors are plot against the grade points obtained along Y-axis. Description of factors has already been mentioned in section 2.1.
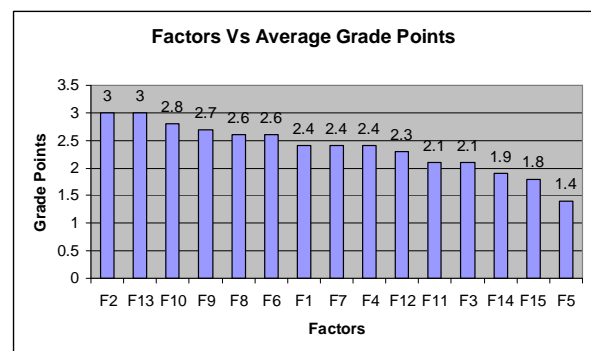

Diagram 1: Factor Vs Average Grade Point
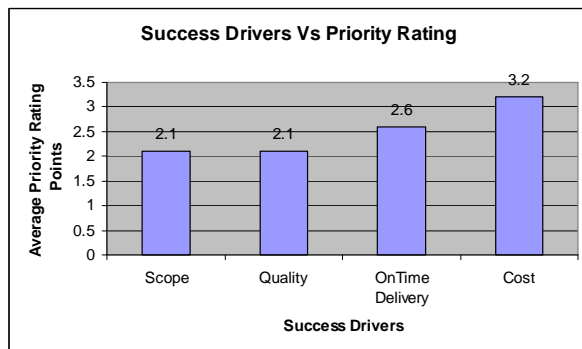
4.2 Detailed Analysis

- According to the respondents, lack of project management practices is one of the most important causes for the project failure. It is hence essential to utilize efficient project management practices as defined by PMI[1] in PMBOK[2] Guide or SEI[3]'s CMMI[4].

- Organizations quest for money is equally critical factor. There is a need for the change in mindsets and organizations should contemplate credibility along with profits.

- Then to follow is Project Managers/Tech Leads incompetence that is largely due to the reason that managers are not properly trained and groomed. It is hence pivotal to arrange appropriate trainings from time to time and possibly encourage them to obtain PMP certification. Future managers need to be groomed gradually keeping in mind the futuristic role they eventually have to play.

- Most software development projects confront great risks and risks might occur in the whole development process. Many projects try to advance current software capabilities and achieve something that has not been done before while the opportunity for advancement cannot be achieved without taking risks [7]. It is highly desirable to follow a proper Risk Mitigation, Monitoring, and Management Plan (RMMM).

- Change/Configuration management practices are also missing which is another important factor. Change Management can ensure standardized methods, processes and procedures are used for all changes, facilitate efficient and prompt handling of all changes, and maintain the proper balance between the need for change and the potential detrimental impact of changes through change control board [8].

- Use of misfitting technologies due to unavailability of expertise is another point. It is better to hire the experts or learn how to say no rather than to provide wrong solution of the problem.

- There is also a need of using proper estimation techniques to avoid schedule slippages instead of relying solely on experience.

- SDLC practices need to be followed to a greater extent particularly requirement analysis phase is ignored or not given due time for which heavy cost has to be paid. Same applies to design phase as well.

- Use of inappropriate process models was found to be a less critical factor for the projects' failure.

- Project staff's incompetence contributes slightly to the failure of projects. It is important that staff should be trained and encouraged to obtain relevant certifications. At the university level students should be taught from the perspective of practicability.

- Employees' turn over and PEST Context are the least candidates as factors that can direct the projects to failure.

- The changing technology seems to be a big challenge particularly for those people who get to work on Microsoft's products but interestingly it was observed that changing technology is relatively insignificant to the failure of the project.

5. ASSESSMENTS OF DRIVERS OF PROJECT SUCCESS

5.1 Statistical Findings

Below is the graphical representation of statistics obtained from the survey regarding finding of critical drivers for project success. On X-axis success drivers against the average priority rating points have been plotted. Scope and Quality have the lowest rating points and hence the highest priority followed by On Time Delivery and Cost.

Diagram 2: Success Drivers Vs Priority Rating

5.2 Detailed Analysis

- As for the success drivers, scope and quality seems to be the most important project success parameters. To maintain quality it is important to adopt proper practices and train the managers to ensure quality. Scope needs to be defined distinctly at the start of the project and any change in scope should be managed through proper change control procedures.

- If above two parameters are managed accordingly and proper project management practices are adopted then timely delivery of the project could be ensured and cost can be controlled easily.

6. CONCLUSION

In this study, we determined the key factors that are more likely to be the potential cause of high rate of projects' failure. Lack of project management practices, IT service providers' quest of making high profits, ignorance of risks, and change/configuration management were found to be the most defining factors in failure of IS Projects. We further examined the success drivers among which scope and quality were found to be the most critical drivers that can guide the project to success. Few suggestions were also given as counter measures which can serve as a guideline towards minimizing the failure of IS Projects.

7. ACKNOWLEDGMENT

8. REFERENCES

[1] Chun-Hui Wu, Shiow-Luan Wang, Kwoting Fang, "Investigating the Relationship between IS Project Risk and Project Performance*", Proceedings of the third international conference on convergence and hybrid information technology, 2008 IEEE.*

[2] K. Lyytinen and R. Hirshheim, "Information systems failures – a survey and classification of the empirical literature," *Oxford Surveys in Information Technology*, vol. 4, pp. 257-309, 1987

[3] J. Johnson. *My Life Is Failure: 100 Things You Should Know to be a Successful Project Leader*.Standish Group International, West Yarmouth, MA, 2006.

[4] Stephen P. Masticola, "A Simple Estimate of the Cost of Software Project Failures and the Breakeven Effectiveness of Project Risk Management", *Proceedings*

of First International Workshop on the Economics of Software and Computation (ESC'07), 2007 IEEE

[4] Alexandre Alvaro, Daniel Lucrédio, Vinicius Cardoso Garcia, Antonio Francisco do Prado, LuisCarlos Trevelin, "Orion-RE: A Component-Based Software Reengineering Environment", *Proceedings of the 10th Working Conference on Reverse Engineering, 2003 IEEE.*

[5] O. Demirörs, Ö. Yildiz, A.S. Güceğlioğlu, I. Bulvari. "Using cost of software quality for a process improvement initiative." *Proceedings of the 26th Euromicro Conference*, Maastricht, 2000.

[6] S.A. Slaughter, D.E. Harter, and M.S. Krishnan. "Evaluating the cost of software quality." *Communications of the ACM*, 41(8):67-73, 1998.

[7] Ye Tao, "A Study of Software Development Project Risk Management", *Proceedings of International Seminar on Future Information Technology and Management Engineering 2008 IEEE*

[8] http://en.wikipedia.org/