DOI: 10.31357/fmscmst.2007.00221

An Empirical Study of Software Development Failures in Sri Lanka

By

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(GS/MC/2361/2004)

Thesis submitted to the University of Sri Jayewardenepura for the award of the Degree of Master of Science in Management on 31th December 2007.

Declaration Statement

The work described in this thesis was carried out by me under the supervision of Dr. Sampath Amaratunge (Dean, Faculty of Management Studies and Commerce, University of Sri Jayewardenepura), and a report on this has not been submitted in whole or in part to any university or any other institution for another Degree/Diploma.

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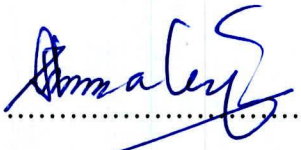
Supervisors' Declaration Statement

I certify that the statement made by the candidate is true and that this thesis has been accepted for submission to the University.



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Abbreviations and Nominal Definitions

Abbreviation/ Concept	Definition
ACM	Association For Computer Machinery
BOI	Board Of Investment
Bypassing Lifecycle Stages	Software development life cycle is a set of steps which should be followed when developing software. This factor deals with software developers not following these steps properly and by- passing some steps.
Causes	Phenomena which directly causes the factors of software development failures to originate in software development projects.
Change Management (Customer Side)	The lack of change management practices in the customer organization.
Changing User Requirements	The tendency of the customer to changes requirements during the development process.
Communication between Members of the Development Team	Communication mechanism that exists inside the software development team to communicate with each other concerning work related matters

Communication between the Development Team And Users	Communication between the members of the software development team and the customer of the software (organization the software is developed for)
Corporate Politics with Negative Effects on the Project	This factor deals with internal corporate politics in the software development organization which might affect the success of the software development process.
Customer	Organization the software is built for.
et al	And Others
High Employee Turnover	This factor deals with the high employee turnover of the software development team.
IEEE	Institute of Electrical and Electronics Engineers
Inadequate Testing	Software testing is the main factor which checks if the software is working properly. This explains that the testing is lacking.
Insufficient Budgets	A specific budget will be allocated to every software development project and this deals with the insufficiency of the budget allocated.

Incorrect or Conflicting User Requirements	This factor deals with the development team getting incorrect or conflicting requirements for the software by the customer.
Insufficient Research	When using new technologies the developers have to do a lot of research and understand the proper implications of these technologies. This deals with the lack of sufficient research.
IT	Information technology
Lack of Commitment of Team Members	This factor deals with the lack of commitment for the successful completion of the software product among the members of the software development team.
Lack of Industry / Domain Knowledge	Software developer is expected to have a good knowledge about the industry to which the software is being developed for. This explains lack of knowledge of the software developer regarding the industry in which the software belongs too.
Lack of Proper Documentation	Lack of documents related to the software under development. The documents will include software requirement specifications, sign off documents etc.

Lack of Proper Quality Standards	Software as a product should have quality standards and this factor deals with the lack of quality standards maintained when developing the software.
Lack of Skilled Staff	There are certain skills required when developing software and this specifies that these skills are lacking in the software development team.
Lack of Top Management Commitment	Lack of top management commitment in the customer organization.
Lack of Training of Staff	Lack of training given to the members of the software development team on technologies.
Lack of User Participation	When developing software the participation of the people who are going to use the software in the customer organization is essential. This factor deals with the lack of participation of the customer organization users.
Misunderstanding User Requirements	This specifies that the needed requirements of the intended software to be developed are misunderstood. This will lead to a software product which is does not support the customer's business requirement.

Misunderstanding User Requirements	This specifies that the needed requirements of the intended software to be developed are misunderstood. This will lead to a software product which is does not support the customer's business requirement.
Poor Management Skills	Management skills of the people who lead the software development team.
Poorly Defined Project Scopes	Any software development project should have a clearly specified scope in which the software should be developed in. This factor deals with the lack of a proper scope of the software.
Resources Shifted from the Project	This factor deals instances where resources in a software development project (software developers or any other resources attached to the particular project) get shifted to other projects.
Requirements	Expected functionality of a software product.
R&D	Research and development
SEA	Software exporters association
SLASI	Sri Lanka Association for the Software Industry

Software Development Failures	Software projects in Sri Lankan software development companies which either exceeds its, cost, time or does not conform to its required functionality.
Undefined Project Success Criteria	There should be documented criteria to measure the success of the software development activity. This factor deals with the lack of a properly defined success criteria.
Unstable Organizational Environment	This factor deals with the stability in the software development company.
US	United States
Use of Incorrect Modelling Techniques	Software development team not using proper software modelling to model the software.
Use of Wrong Technologies	This explains that the technologies used in the development of the software product are not in line with the needed appropriate technology.
User	People who ultimately use the software product in their day to day activities (employee's in the customer organization)

Acknowledgement

I would like to convey my utmost respect and gratitude to my supervisor Dr. Sampath Amaratunge (Dean, Faculty of Management Studies and Commerce, University of Sri Jayewardenepura) who guided me through this study in an exemplary way and helped me immensely in every aspect in terms of making this study a success.

Secondly I would like to extend my deep gratitude and respect to all the lecturers who lectured me on a diverse range of topics during the course of this masters program. The knowledge gained in these lectures not only enhanced my academic knowledge but also went a long way in terms of improving my personality to be in line with a master's graduate and was the foundation in which this study was carried out in a successful manner.

I would also like to express my deep gratitude to Dr. P.D. Nimal, (Coordinator, M.Sc. in Management Program, Faculty of Graduate Studies, University of Sri Jayewardenepura) for all the help and assistance given to me in the process of completing this study. Also I will be failing in my responsibilities if I don't extend my special thanks and gratitude to Mrs. Sumithrani Amaratunge who also helped me immensely in concluding this study in a successful manner.

Finally, I would like thank my wife and parents for having the patients and the understanding in helping me complete this study successfully.

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ABSTRACT

Software development projects are considered as an unique entity in terms of project management due to the inherent attributes it encapsulate making them distinct and susceptible to failure. Therefore the importance of software project risk management is emphasized where the identification of the factors, which affects software development projects to fail, being the main component. This survey based study focuses on identifying the factors that affect software development failures and the causes of these factors in Sri Lankan software development companies. Twenty-seven factors affecting software development failures were identified using a stringent scientific methodology and were tested to ascertain their validity, importance and the causes in terms of the Sri Lankan context using an interview based questionnaire. Twenty-five software development companies, which belong to the software exporters association, were selected for data collection and the gathered data were analyzed to ascertain the significance to the defined objectives using statistical tools. Misunderstanding of user requirements, poor project management skills of managers and the lack of communication between the members of the software development team were identified as the top three factors affecting software development failures in Sri Lanka while the lack of proper communication between the development team and the customer, poor project management knowledge of managers, and lack of proper planning were identified as the main phenomena which causes these factors to originate in software development projects in Sri Lanka.