ISSN: 2348 - 2117

International Journal of Engineering Technology and Computer Research (IJETCR)
Available Online at www.ijetcr.org
Volume 3; Issue 5; September-October-2015; Page No. 109-112

Risk Management in Software Projects by following predefined Standards

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Abstract

Risk identification, control and its reduction collectively called as risk management which is a core element of any project. Risk analysis includes risk identification and to minimize their effects to make a successful project. In this research we have given an overview and analyzed different techniques currently being used in projects including six sigma philosophies which are potentially being used in industries especially in IT sector. We have concluded with some suggestions for risk managers and project managers to adopt for managing risk and infact managing whole project.

Key Words: Risk Management, SS (Six Sigma) , Software Project.

INTRODUCTION

Six Sigma started in 1985 when Motorola examined the outside dangers of losing piece of the overall industry as a main organization of the business sector in its field. Charge Smith the father of SS, a designer in Motorola, understood that Japanese brilliant items are the primary purpose for this misfortune. Visits to assembling organizations to Japan were orchestrated with a specific end goal to dissect the levels of item quality and operations. It has been finished up by Motorola specialists that Motorola's item is not a client driven and the working expenses are high contrasted and Japanese items [2].

To adapt to this risk Motorola embraced a technique to diminish incorporating so as to work expenses and enhance consumer loyalty measurable routines with business process change strategies. This methodology puts client as the first need and uses truths and measures to discover answers for his needs. To address these issues close flawlessness factual motto is set; 3.4 imperfections for each million open door. In the event that the previously stated ideas of this methodology are blended we can just characterize SS as a client centered, information driven, process change and issue recognizable proof system which uses measurements and in addition exploratory strategy to accomplish primary concern results. So we can say that SS is the methodology we can use for management of any project.

1. OBJECTIVES:

Software are playing major roles in their society, from a small toy to big aeroplane, all things are under the control of some software systems. These software's are not built in a night or by a single person, they need time, team and finance to complete according to requirement of the stakeholders. Completion of this type of software can be said as a complete project, as it is not a scheduled activity instead we are going to produce a new thing involving time, cost, and quality. When we talk about quality it means the satisfaction of customer which cannot be ignored in these days, as companies cannot survive without customer satisfaction.

Projects run in the atmosphere composed of insecurity. There can be the insecurity regarding project financing, availability of team members, lack of required skilled persons, technical issues- the list can be endless. These in securities can cause project risk and there should be need of risk management. Risk management in software project is a hot topic of today's investigation. The reason of our research was to conduct an analysis of existing risk management tools. This study have not been conducted for IT project, it has been a generalized form that will be helpful in every project risk management. The aim of this research was to evaluate existing techniques and procedures including six sigma used for risk management. On the base of this assessment, we have recommended a new approach to assess, control and reduce risks in software projects [8].

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2. REVIEW OF LITERATURE:

Researcher observed seven major factors presented here: First one was the little participation of testers in the planning phase SDLC which led to underestimation of the scope of the testing process and resources required. Second one was poor hiring of person for testing from project managers, which led to deficient concentration of testers in some SDLC procedures. Third one is the adventuresome manners of project managers led them to omit some significant tests. Fourth one is the organizational structures and techniques of procedure within the companies limited the permission and visibility of testing and quality assurance personals in development projects. Fifth one is misunderstanding in financing and agreement between customers and the software developing companies which restricted the level of testing. Sixth one is resources management, it was related to pitiable use of available resources and systems which creates a communication gap between development teams and clash in requirements understanding; and last one is customers' motivation to oblige in after-sales testing imperfect the extent and competence of such testing and result will be affected software quality. This research pointed out testing challenges which negatively affect the quality of the product. Finally it was concluded that software quality also based on organizational structure and movement of information from customer to development team and team leader play an important role in this process, if he will provide correct information about the required product, the result will be near to perfection otherwise, it will led to errors, ambiguities and failure of the project [3].

Paper presented a model system integration technical risk assessment model (SITRAM), which is based on Bayesian belief networks (BBN) joined with parametric models (PM). In this model statistical information for decision makers, improving risk management of complex projects is provided. System integration technical risks (SITR) also represented as an important element of project risks related with the development of large software rigorous systems for defense and applications used commercially. They proposed a theoretical modeling approach to deal with the problem of System integration technical risks (SITR) measurement in the beginning of a system life cycle. Early risks' classification and risks' and their relationship have been recognized using a hierarchical holographic modeling (HHM) technique to identify risks. The suggested approach includes a set of BBN models which represents associations between risk causing elements, and complement PMs which is used to supply input data to the BBN models. Initially, BNN model is used to identify risks, PMs provides risk relationships and then combine them to form a hybrid model by selecting Boehm's approach. In conclusion they summarize the beneficial factors and limitations of SITR evaluation based on BBN models [6].

This research highlight some challenges including the fact that majority of SDP research consider the impact of defects while performing predictions but do not provide the guidelines about how to use its results. So he provides an approach that will predict major defects and also provide a simplified model of SDP that is easily understandable. Organizations are more focusing on risk rather than defects. While development risky changes may not make defects but they can delay the release of product. In his proposed approach we can predict risky changes and implementation of SDP for predicting risks before they become a part of coding [1].

Researcher proposed responsibilities for 'risk managers 'as they assumed to be responsible for the whole process of risk management. But in of software engineering field this term "risk manager" is not clearly defined and having uncertainty over the term's meaning. After studying many research papers about risk management but we still don't have clear picture about the person who will handle all these tasks of risk management. The main purpose of this research paper is to analyze the literature and to make the terms understandable and clear to find the true role of a risk manager for efficient software project risk management.

They classify risk managers into five categories including Software Project Manager of Risk, Software Project Risk Consultant, Chief Software Project Risk Manager, Professional Software Project Risk Manager and Designated Software Project Risk Manager. It is difficult for an organization to find a professional Risk Manager for software development project so it is suggested to make team leader as risk manager as they already have risk analysis, management and software engineering knowledge. Additionally, they suggest that universities should offer special courses to train software engineers for their future to become good risk managers. At the end, author suggests to conduct further/future research on significance role of risk managers in risk management [4].

Paper concluded that comparison of different models for risk management. They conclude that risk should be identifies during requirement gathering from experts and customers. A survey was also conducted to know the

insight of respondents on their practices of managing project risks. This paper also gives information about the results of the survey regarding the most wanted features for risk management tool (RMT). For this purpose requirements were assembled from experts and were investigated. After concluding results, the authors suggested, planned and developed the tool to automate the Boehm's Risk Management process [4].

Author told that their experiences with industrial software development projects have often revealed that requirements change even after their formal approvals. Although the requirements are never stable, proactive identification of potentially changeable or deferrable requirements, and estimation of their impacts early in a project can be useful in minimizing the risks and cost overruns. In practice, the decisions to change or defer certain requirements were based on experience, and were mostly driven by business needs and product release timelines. There are no techniques available which could foresee such changes early in the project. In this work, they performed exploratory analysis of the requirement artifacts from thirty three industrial software development projects and shared their observations on different requirement change attributes. Through empirical analysis, they evolved the relative weights of each of these attributes in terms of their impacts on the project schedule and effort. Based on the analysis, a model was developed to predict the impact due to requirement changes and it was validated. That model could be used to develop a requirement change decision support tool to assist decision makers [10].

In this paper author told that Risk management was a prominent activity, which aims the mitigation of undesirable issues during a project life time. In this context, techniques have been proposed to evaluate the impact of risks, but probability estimates are usually neglected, affecting a proper evaluation of such issues. This work presents an approach based on dependability models (e.g., stochastic Petri nets) for probabilistic evaluation of risks regarding the turnover of team members and requirement implementation in software development projects. Two case studies are adopted to demonstrate the feasibility of the proposed technique. Keywords-Risk Assessment, Dependability, Petri Nets, Reliability Block Diagrams. This work presented an approach based on dependability models for evaluating development risks on software projects. Real-world case studies demonstrated the feasibility of the proposed approach, in which several scenarios were evaluated, including the adoption of dynamic redundancy and maintenance policies for improving dependability. Although this work has demonstrated the application of such techniques for turnover of team members and requirement implementation, other risk types may be evaluated as well. As future works, we are considering other risk types as well as perform ability models to estimate the impact of risks in the performance of development processes [9].

3. RECOMMENDATIONS:

Six sigma methodologies have some standards and defined procedures, beside this we also have some rule and regulations set by ISO for project management.

A. ISO 21500:2012

This is guidance *on Project Management*, is a worldwide typically formed by the International Organization for Standardization. It is released after the effort of five years from 2007 to 2012. It was designed to present universal support, make clear interior viewpoint and what include high-quality performance in project management. These standards give detailed enlightenment of theory and processes that are measured necessary for high-quality project management practices.

For Risk Management we have ISO standards as follows

B. ISO 31000:2009

ISO 31000 is a family dealing with risk management standards, published on 13thof November 2009. The aim of these principles is to provide general, suitable and valid guidance for risk organization process. It gives general rules that can be applied in any industry and not specifically made for a single company. It provides complete guidelines for the plan, execution and preservation of risk management procedures all the way through an organization.

Presently, the ISO 31000 family is predicting to include:
ISO 31000:2009 - Principles and Guidelines on Implementation
ISO/IEC 31010:2009 - Risk Management - Risk Assessment methods

ISO Guide 73:2009 - Risk Management - Vocabulary

- 31000:2009 gives a list on how to treat risk:

1. Keeping away from the risk by choosing not to start or carry on with the movement that provides rise to the already existing risk.
2. Accommodating or rising the risk in order to follow an chance.
3. Eliminating the risk factors
4. Altering the possibility.
5. Altering the after effects.

6. Allocation the risk with another party or parties (together with contracts and risk financing)
Preserving the risk by conversant conclusion.

C. KEY FACTORS OF SIX SIGMA

The main key factors of Six Sigma are [5]

- Orientation on Customer Satisfaction
- DataS
- Reach-Out Objectives
- Depend on Team
- All Workers should be Engaged
- Unambiguous Description and consideration of Roles
- Individual Escalation (growth)

D. ROLE OF HIGHER MANAGEMENT

Senior management support and trust is vital for better risk management activities. Risk management process require higher management acceptance of risk as major threat for the project success. Higher management should support project manager in the following activities [10]

- Provide sufficient employees, finance, time, and other facilities (e.g., tools and equipment);
- Make sure project management receives the necessary guidance in recognizing, supervising, and exchange a few words about software risks;
- Ensuring project team receives the compulsory training in performing risk management tasks.

4. CONCLUSION

In this paper we have looked into the famous methodologies used for Risk Management and examined the condition of Risk administration in each of these methods. Subsequently, we found that some product advancement procedures innately include hazard administration. For every procedure, this requires certain circumstances to exist. This shows that risks are unavoidable in most project improvement strategies, and that all product advancement philosophies, including the danger driven ones, require that hazard administration be upgraded in it. We have highlighted some standards after following them we can minimize risk and save millions in a single project.

A fascinating measurement for future exploration is to discover a methodology that goes for upgrading RM in the distinctive development improvement procedures.

ACKNOWLEDGMENT

I thank my advisor Mr. Ahsan Raza Sattar for his guidance, support and advice for writing the thesis and research papers during the degree of MS.

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