A Conceptual Model for the reduction of Time based risk in the Software Project Management

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ABSTRACT

Software Risk Management is a proactive approach for the minimization of loss and maximization of the productivity. We have proposed a model for the Software Risk Management based on the Developer, Development process and the customer. This model concentrates on the each element with the qualifying benchmark and strategies so that the whole process is optimized. The model has been used for the calculation of the schedule based risk and it as been compared with the existing method. The results are discussed.

Keywords:

Risk management, Process, schedule based risks.

1. INTRODUCTION

Software forms the nuts and bolts of the day to day modern life. Software development and implementation pictures various threats. They are the risks involved in creating expected quality software with in the given time and the anticipated budget. The risks cannot be just simple details in the project, but they should be the core of the business [1]. To do take success over the risk we need discipline more than good processes and intuitive think ability, this discipline is called risk management.

Software Risk Management is a proactive approach for minimizing the uncertainty and potential loss associated with a project. This process of Software Risk management is categorized as risk identification, risk quantification, risk response development and risk response control [2]. Risk need not to be the same for all the software projects unlike other projects can be anticipated with the common type of risk, because of this project risk management techniques that rely on the definition of risk are likely to be of limited benefit in the software pitch. This could be a further reason why many of
the techniques found in the research literature are not used in practice [3].
[4] defines risk as "In the context of software engineering and development, risk can be defined as the possibility of suffering a diminished level of success within a software-dependent development program. This prospect of loss is such that the application of the selected theories, principles or techniques may fail to yield the right

software product". This says that risk should be viewed only as the negative threat. But [5] says that risk can be viewed as both the threat as well as the opportunity. Some methodologies like Agile have the specific intent for making opportunity from the threats.

In this paper we propose a model for the reduction of risk. This model has brought in the features of the geocentric leaders, Total quality management (TQM), Lean manufacturing and Customer relationship management (CRM).

2. BACKGROUND STUDY

New technologies, increasing global reach, shrinking and diverse workforces, stakeholder pressure and new approaches to work are creating challenges and inflection points. Software development is also an important challenging task in the arena. The SEI risk identification method is based on the following assumptions:

• Software development risks are generally known by the project's technical staff but are poorly communicated.
• A structured and repeatable method of risk identification is necessary for consistent risk management.
• Effective risk identification must cover all key development and support areas of the project.
• The risk identification process must create and sustain a non-judgmental and non-attributive risk elicitation environment so that tentative or controversial views are heard.
• No overall judgment can be made about the success or failure of a project based solely on the number or nature of risks uncovered.

We need to explore ways to transform risk management into a problem which is structured and which in turn will lead to proper solutions. Part of the problem is misinterpreting the importance of risk management. It is usually and incorrectly viewed as an additional activity layered on the assigned work, or worse, as an outside activity that is not part of the software process [6][7].

There are three main groups of research related to risk:
1.   Software Risk management by the reliability measure :
2.   Unstructured methods
3.   Model based approaches

Based on the reliability measure

This approach use the probabilistic approach to test the reliability of the product [8][9][10]. But this approach doesn't address the problem of completing the project within the budget and the time. The main draw back of this model is the reliability has been checked when the product is delivered for the testing.

Unstructured methods

In this approach the risk is assessed from the beginning of the development process. This approach is more subjective than structured. This process uses some checklist of the process to be done [11][12][13][14]. It may also use some scoring techniques[15].

Model based approaches

This approach uses a estimation model for the control of the project. The mostly used methods are COCOMO[16] and SLIM [17], which assumes the requirements once made will not be changed and needs the size of the product as the calculation seed.

3. THE PROPOSED MODEL

The model we propose in this paper is adaptable to the Global business. We are dividing the business model into three stages. The first one is the Input stage; here we discuss the approaches to be followed and the strategies to be adopted for the input to the business. Next stage is the process stage and the final stage is the Output stage.

Input

The input to any type of business is very important in the case that it should be processed and delivered as the output. The inputs are those things that affect changes in organizations Companies can apply one of the three different approaches to managing and staffing their subsidiaries [18].Here we are going to follow the Geocentric approach having the quality and reliability as the basic line of code.The human resources and the raw materials can be get into the company in the global basis.

The startegey to be followed for the tie up with the suppliers is the combination of Strategic Alliance (SA) and Joint Ventuers (JV). Based on the suppliers we have to decide which startegy we have to follow.SA is a formal relationship formed between two or more parties to pursue a set of agreed upon goals or to meet a critical business need while remaining independent organizations The alliance is a cooperation or collaboration which aims for a synergy where each partner hopes that the benefits from the alliance will be greater than those from individual efforts.
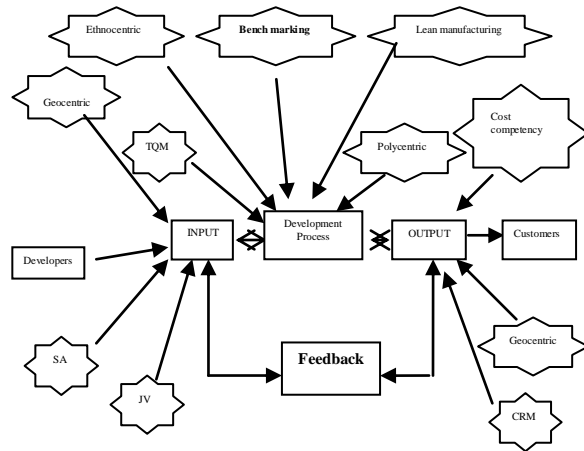

Fig: Proposed Model

Process

Processing is the action of development of the software. In any type of business the cost reduction can be implemented effectively in this stage. We propose to follow the lean Manufacturing philosophy which is a management philosophy focusing on reduction of the seven wastes to improve overall customer value [19]. Following the philosophy we can reduce the wastage in production, processing itself, defective product.

The strategy we proposing is Total Quality Management (TQM), which is a management strategy aimed at embedding awareness of quality in all organizational processes [20]. TQM has been widely used in manufacturing, education, government and service industries.

The approach followed is partly Ethnocentric and partly Polycentric. The ethnocentric approach is mainly decided for lowering the labor costs but the Human resource selection is based on competency. Employee empowerment is an important criteria, which reduce the mobility of the employee. Differentiation strategy involves creating a product that is perceived as unique. The unique features or benefits should provide superior value for the customer if this strategy is to be successful. This can provide considerable insulation from competition.

Benchmarking and technical know-how through tie ups are used for the tight cost control this may be the threat to the competiters , the new entrants and threat to substitutes which especially focus on the cheaper product.

Output

This stage plays the role with the customers, who are the receivers of the product. Here we propose to implement the effective Customer Relationship Management (CRM) which is a combination of Operational CRM and Analytical CRM. Operational CRM looks for the automation or support of customer processes that include a company's sales or service representatives. For the representatives to reach the customers we are using the geocentric approach. Here we have to constitute a mobile base of developers who are used in a variety of facilities as the need arises.

The Analytical CRM analyzes customer data for a variety of purposes including design and execution of targeted marketing campaigns to optimize marketing effectiveness, design and execution of specific customer campaigns, including customer acquisition, cross-selling, up-selling, retention, analysis of customer behavior to aid product and service decision making, management decisions, risk assessment and fraud detection

The various issues in this stage are cost competency, segmentation competency and differentiation strategy. This strategy emphasizes efficiency. By producing high volumes of standardized products, the firm hopes to take advantage of economies of scale and experience curve effects. The product is often a basic no-frills product that is produced at a relatively low cost and made available to a very large customer base.

In segmentation strategy the firm concentrates on a select few target markets. It is also called a focus strategy or niche strategy. It is hoped that by focusing your marketing efforts on one or two narrow market segments and tailoring your marketing mix to these specialized markets, you can better meet the needs of that target market. The firm typically looks to gain a competitive advantage through effectiveness rather than efficiency. It is most suitable for relatively small firms but can be used by any company. As a focus strategy it may be used to select targets that are less vulnerable to substitutes or where a competition is weakest to earn above-average return on investments.

4. RESULTS AND DISCUSSION

We have simulated the scenario for the proposed model with the benchmarking of SEER-SEM model, which uses the following formula for estimation of the time duration of the project.

$$Td = D^{-0.2} * (Se /Cte)^{0.4}$$

Where

Td- Time duration expected for the development of the project

D is staffing complexity - a rating of the project's inherent difficulty in terms of the rate at which staff is added to a project.

Se is effective size calculated based on the language dependent expansion factor.

Cte is effective technology - a composite metric that captures factors relating to the efficiency or productivity with which development can be carried out.

Based on the model we have derived the expected time duration of development using the factors we have already discussed.
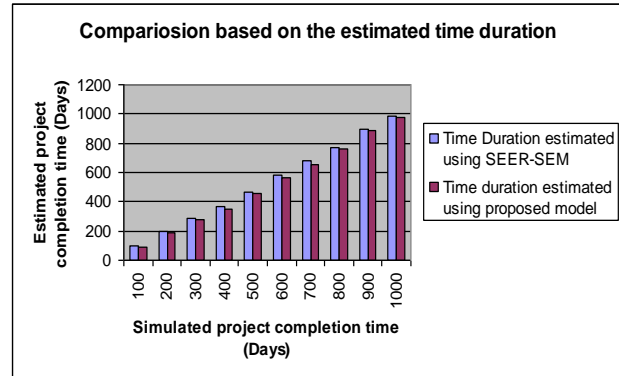
Based on the results the comparison shows that the proposed model shows on improvement in the estimated completion time. So using this process we can reduce the risk of incompletion of the project with in the given time.

5.CONCLUSION AND FUTURE ENHANCEMENT

In this paper we have proposed the model for the risk management in terms of time. The proposed model showed an improvement over the other method followed for the estimation of the time. In this paper we have discussed about the risk management based on the time. The future enhancement may be concentrating the improvement of the model for all the areas vulnerable to risk.

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