Design of Risk Management Process for Concurrent

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Abstract. In this paper describes a risk management approach designed to support the Risk Management Methodology and adapted to design software to be used in concurrent product/process design and development. A conceptual framework for integrating corporate, product and process knowledge that establishes context of projects is described and systematic approach used to identify, assess and mitigate risk at the early stages of project life cycle, thus preventing project failures are covered.

Keywords: Risk, Concurrent, Design

1 Introduction

In practice the process of assessing overall risk can be difficult, and balancing resources used to mitigate between risks with a high probability of occurrence but lower loss versus a risk with high loss but lower probability of occurrence can often be mishandled[1, 2].

Concurrent Engineering is the product development process used to reduce time-to-market, decrease cost, and improve. Project team members from different departments carry out tasks simultaneously, especially in the design phase. A new design can be tested and corrected while the product model can be visualized by using prototyping technology before it is actually manufactured. Thus, product development cost is lowered and product quality is satisfied[3, 4]. Since, CE requires involvement from several departments to develop a successful design, continuous interactions with several entities in a project are essential in CE. Moreover, sharing of limited resources make CE projects complicated because parallel tasks consume or share the same resources with several other tasks simultaneously. Hence, CE requires more professional management to deal with a more complex environment[5].

In multi-site CE projects, integrations and interfaces among different functional departments between projects are complex. For instance, technological prerequisites, system integration, several stakeholders, and different objectives increase difficulties in projects through resource and input-output interdependencies. Further problems in multi-site projects arise from allocation of resources, project locations, project priorities, job scheduling, and conflicts among project objectives[6]. In conclusion, multi-site CE projects environment is very complicated with emphasis on team
collaboration, communication, organizational structure, and cultural support. Hence, difficulties encountered in CE projects need to be addressed for successful implementation of projects. Effective project management strategies as well as a systematic risk management methodology must be established to overcome these difficulties and complexities.

2 Risk Management

There are several different definitions for risk found in the literature. Generally two aspects of risk are referred to i) an exposure to loss or ii) probability of loss in a project. For the definition of risk to be universally applicable and also to be able to be measured, risk for the purpose of this research was defined as probability of an unexpected event that may cause an outcome to deviate from the plan. Risk management is the identification, assessment, and prioritization of risks followed by coordinated and economical application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events or to maximize the realization of opportunities [7, 8].

Fig. 1. The Risk Management Process

3 Design of Risk Management Process

Risk management process (Figure 2) is as much about identifying opportunities as avoiding or mitigating losses. According to the Risk Management Standard, the governing body must develop and implement systems which: are fully supported by
management and backed up by an organizational policy and framework, which are fully communicated to all affected parties; result in an effective program for the management of risk; ensure that the risk management process is adopted by those in charge of projects; and ensure that the risk management activities remain effective and relevant by way of regular monitoring and review.

Fig. 2. The Risk Management Process and Tasks

The roadmap provides the required platform for the development of an “Intelligent Risk Mapping and Assessment System” The primary aim is to support the Project Managers in managing potential project risks during the life cycle of the project. To design and develop its functional requirements need to be identified and the framework formulated. Based on the formulated system framework, the modules are required to meet the functional requirements. Considering the requirements for risk management in an environment and the risk management process presented in need to cover the following:

- Provide user input facilities to define project involvement and promote interactions between project participants;
- Establish project context from the defined project involvement;
- Identify the project risks and trigger events based on the established project context;
- Analyze the relative risks impact and their probability of occurrence;
- Prioritize the project risks based on their degree of magnitude;
- Identify relevant risk mitigation alternatives, based on captured knowledge;
- Prioritize the mitigation alternative to formulate an optimum risk management plan; and
Capture lessons learned from previous projects, thus providing the basis for risk management of future projects.

4 Results

In this paper describes a risk management approach designed to support the Risk Management Methodology and adapted to design software to be used in concurrent product/process design and development. A conceptual framework for integrating corporate, product and process knowledge that establishes context of projects is described and systematic approach used to identify, assess and mitigate risk at the early stages of project life cycle, thus preventing project failures are covered.

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