



A CASE STUDY REGARDING RISK MANAGEMENT IMPLEMENTATION

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Abstract: Risk management is a formal, systematic process applied in manner to identify, analyze, and respond to both positive and negative project risks. It involves processes, tools, and techniques that will help the project manager to maximize the likelihood and consequences of positive events and minimize the probability and consequences of adverse events. In this respect, the paper contains the aspects and an applicative study regarding the implementation of risk management processes to the industrial projects in order to analyze and manage the project risks.

Keywords: project management, risk management implementation, risk assessment, monitoring and control of risks.

1. INTRODUCTION

All projects share the same characteristic - the design ideas and transform them into new activities and achievements. Elements of risk and uncertainty always present show that the activities and tasks necessary to implement the projects may never be planned with absolute accuracy when very complex projects, the very possibility of their successful completion can sometimes be called into question. Project management follows the processes and guidelines established by the [1].

The success of all projects is the result of a balance between three elements: time, resources and results (figure 1).

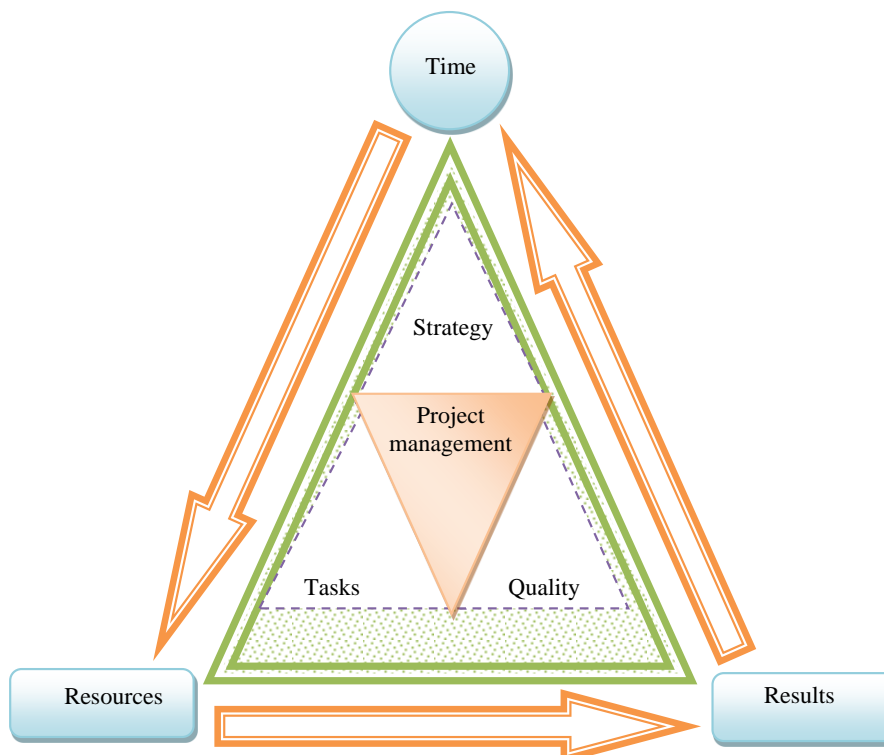


Figure 1 Project management strategy

Risk management represents an essential process of project management.
Risk management process is used by project teams to identify and handle the risks on their project.

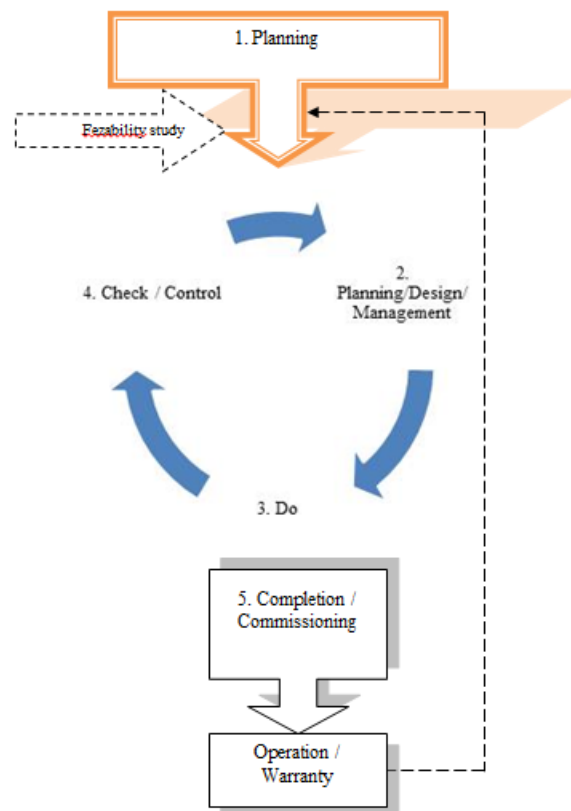


Figure 2. Processes of a project

This would provide the necessary time to adjust the project in correspondence to objectives. The alternative would be adapting to the situation while the project is progressing. Also, it covers the needs of the project team to proactively manage their project

Risk management is an "art and a science" of identifying, evaluating, and responding to the risk conditions throughout the duration of the project, keeping in mind the objectives of the project.

The management of risks involves processes that will help the project manager to maximize the probability and consequences of positive events and minimize the probability and impact caused by negative, or adverse, events to the projects expected outcomes [2].

2. RISK MANAGEMENT IMPLEMENTATION – CASE STUDY

Project risk management includes the processes concerned with conducting risk management planning, identification, analysis, responses, and monitoring and control on a project; most of these processes are updated throughout the project [1]. It involves processes, tools, and techniques that will help the project manager to maximize the likelihood and consequences of positive events and minimize the probability and consequences of adverse events. In figure 3 it is shown the processes of project risk management.

The case study consists of identification, assessment and monitoring of risks for an industrial project. To determine the right level of quality assurance, the projects are divided into three levels of focus (low, medium, high), based on the following collection of project characteristics:

- budget – funds required to perform the project, generally a reflection also of the effort for projects (since much of the cost is in the effort);
- organizations involved – those participating in the project as stakeholders;
- time to deliver – calendar time for the project;
- impact on agency – depth of change implied to the organization processes;
- impact outside the agency;
- technology – maturity of the technology being used;

- supplier involvement – type and level of experience working with the suppliers;
- system complexity – assessment of how difficult is the system.



Figure 3. Project risk management process

2.1. Risk management planning

Structure and processes are established to provide a framework for addressing potential risks to a project.

2.2. Identify project risks

It is evaluate potential risks to the opportunity, to be able to build a project plan that maximizes the probability of project success. Risk identification is generally done as part of a feasibility study, at the beginning of the active project work, and at each new phase of a large project.

2.3. Analyze risks

The identified risks are analyzed to establish the project exposure for each risk and to determine which risk items are the most important ones to address. Risk exposure is defined as the product of the likelihood that the risk will occur and the magnitude of the consequences of its occurrence. In rare cases, the overall project risk exposure will be so high that the opportunities represented by the project really cannot be attained at a reasonable expense. In most cases, though, attacking the most significant of the risk items will maximize the project opportunity.

While the initial risk analysis deals with those risks identified early in the project, more analysis may be needed as the project proceeds. In cases where a new risk is identified, that new risk is analyzed and its exposure compared to that risks already being handled. That new risk may or may not be addressed with a mitigation action, depending on the cost of that action and the ranking of this new risk against others already being handled.

Risks are prioritized according to their potential implications for meeting the project’s objectives. A risk matrix is used to combine likelihood and impact ratings values to obtain a risk score. The risk score may be used to aid decision making and help in deciding what action to take in view of the overall risk. How the risk score is derived can be seen from the sample risk matrix shown in table 1. The organization can define as many risk levels as it believe are necessary. In our case the matrix presents tree domains: high, moderate and low risks.

Table 1. Risk matrix

Probability					
0.90	0.05	0.09	0.18	0.36	0.72
0.70	0.04	0.07	0.14	0.28	0.56
0.50	0.03	0.05	0.10	0.20	0.40
0.30	0.02	0.03	0.06	0.12	0.24

0.10	0.01	0.01	0.02	0.04	0.08
	0.05	0.10	0.20	0.40	0.80
Impact					

The results of risks assessment are graphically illustrated in figure 4.

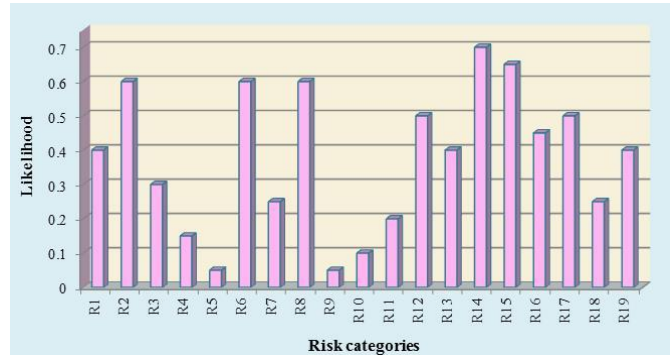


Figure 4 Risks assessment

2.4 Plan risk handling actions

Risks may be handled a number of different ways. Alternatives include:

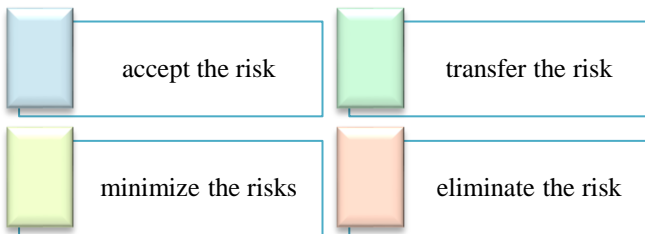


Figure 5 Risks treatment

For significant risks that cannot be mitigated, or where countermeasures are unreliable, contingency plans may be established and then executed if the risk becomes a problem. Contingency plans are normally budgeted and approved apart from the plans for project deliverables.

2.5 Monitoring and control risks

Throughout the project, the project team tracks progress handling the risks, to ensure that:

- actions which should reduce the probability of occurrence are effective;
- actions which should reduce the loss associated with the risk are effective;
- when risks for which there is no possible mitigation action have reached a trigger point for the contingency plan, that contingency plan is performed.

In addition, the team watches for additional risks that need to be addressed, as well as changes in impact or probability to previously identified risks.

The processes of monitoring and control consist in risks evaluation and hierarchy based on risks score (figure 6).

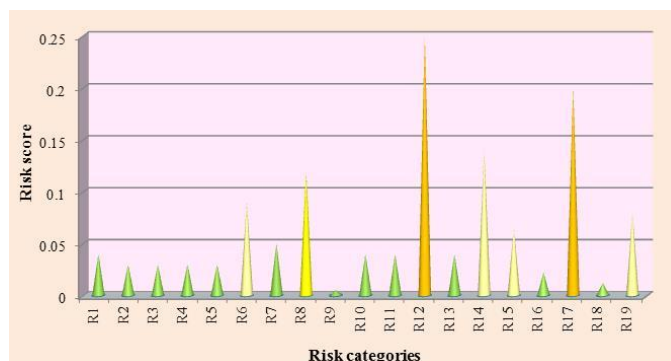


Figure 6 Risks evaluation

2.6 Measures

Measures that can be used to determine the effectiveness of risk management include the following [3], [4], [5]:

- Project risk exposure removed - For each of the risks that were managed, determine the monetary exposure the project faced before performing risk mitigation (the probability the risk would occur multiplied by the monetary impact if the risk should become a problem). Compare this to the amount of exposure that remained after the mitigation activities were done (mitigation should have reduced either the probability and/or the monetary impact of occurrence). This measure can be used only if the initial analysis of a risk was quantified with financial loss, such as the amount needed for extra memory to add to systems deployed across the state.
- Cost effectiveness of risk mitigation – For each individual risk (or for the total across all risks), compute the monetary value of the risk exposure, the cost of the mitigation action, and ratio of the two to determine the cost effectiveness of the action taken.

2.7 Verification activities

While risk management is being done, the following verification activities are appropriate for management:

- When reviewing project progress, include risk management status among the items being reviewed. Ensure that the project manager and project team are performing their planned risk management activities and their planned risk mitigation activities.
- When risk management actions require the assistance of management, ensure that the management tasks have been accomplished according to the plan that was set.

3 ROLES IN THE PROCESSES FOR ANALYZING AND MANAGING PROJECT RISK

Project Manager:

- drives the risk management process at the start of a project;
- participates in risk identification, mitigation, and controlling progress throughout the project;
- accepts or rejects the level of risk for the project.

Project Team:

- performs the risk management process for this project.

Risk Identification Team:

- provides input to the process for identifying risks;
- includes representatives of all affected groups involved in the project (including the Project Team, Steering Committee, organization management, etc.), as well as any others expected to have insight into risks for this project (such as Internal Audit, and/or external reviewers).

Risk Mitigation Team:

- performs actions to reduce the exposure from this risk, focused on either or both of probability and consequence of the risk;
- may be members of the project team, other affected groups, user, customer, management, and others, depending on the risk item.

When considering the risk management work of the project, there are three areas to consider:

- a) Risk management – identifying, analyzing, planning, and monitoring – should be a small part of the project infrastructure.
- b) Risk mitigation – the work required to handle the risks. It may be small or it may be significant. In either case, it's a part of the work breakdown structure of the project, and it gets scheduled like any other work item.
- c) Contingency management – work defined in contingency plans. This is generally not included in the project work breakdown structure, but is additional work to be budgeted and done if the contingency condition indicates it is time for the contingency plan. The risk management plan should make such contingency estimates clear, and the plan should identify the method for getting approval for the funds/effort/other resources to conduct the contingency plan, if the need should arise.

4 CONCLUSIONS

- Project risk management offers a great opportunity to improve project performance dramatically. The amount of work needed to implement the project risk management process is considerably less than that devoted to other project variables such as cost, schedule, or quality, yet the benefits are equally great. The greatest challenge to implementing a project risk management lies in changing corporate culture. However, once this is done, and risk management becomes routine, it will add greatly to the probability of project success [6].

- To be competitive, an organization must be proactive in managing the risks to successful achievement of the cost and schedule objectives for its projects. The risks management implementation can improve the quality of supplied products and processes through the identification, monitoring and control of risks.
- Risk management is an "art and a science" of identifying, evaluating and responding to the risk conditions throughout the duration of the project, keeping in mind the objectives of the project.
- Risk management needs to be seen as identifying problem areas in advance and not as they happen. This would provide the necessary time to adjust the project in correspondence to objectives. The alternative, not pleasant, would be adapting to the situation while the project is progressing. Time and money can be lost here. This is a formal process where a business applies defensive response planning in the wake of mitigation by avoidance, deflection of risk through the contract or by insurance, and contingency planning by providing allowances in the budget for the uncertainties.

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