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**IS 637 – IT PROJECT MANAGEMENT - TERM PAPER**

**PROJECT RISK MANAGEMENT**

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**Abstract**

This paper focuses on risk management as an effective method for project management in depth. Every project has its own set of risks, which cannot be avoided, but mitigating steps can be implemented if risks are detected early enough. This paper explains why risk management is such an important project success factor. It discusses risk management processes such as risk preparation and management, risk assessment, qualitative risk analysis, quantitative risk analysis, and risk response planning. Furthermore, it provides project managers with additional insights on risk management best practices. In essence, the paper captures some of the key ideas from previous risk management research and shows how they can be implemented in a real-world project.

1. **Introduction**

An information technology (IT) project is a type of project that deals with IT infrastructure, information systems or computers. Examples of an IT project include web development, software development, mobile app development, network configuration, software implementation, hardware installation, database management, and IT emergency recovery.

IT project management (ITPM) is the planning, scheduling, execution, monitoring and reporting of IT projects. While many industries focus exclusively on IT projects, IT is unique in that most, if not all, industries have some level of an IT component.

Since they are often very wide in scope, IT project managers must deal with risk, interdependent integrations, software updates, scope creep and so on. Therefore, IT projects require more than the typical project management tools and skills to complete.

IT project management deals with a variety of risks. It ends up interfacing with many other aspects of an organization, such as business administration, human resources, finance and other departments within the organization and entities that are outside of the business. This presents several pressing risks with high stakes, for if the technology goes down, then an entire business can become paralyzed.

An IT project risk is an unexpected occurrence or situation that could have a positive or negative effect on the project. Every day, projects face a range of risks, and how they are handled has a huge effect on the project's performance. In essence, project risk management entails making decisions on how to mitigate risks and developing a strategy to handle the risks that the project faces. Therefore, it is a structured process of defining, assessing, and reacting to risks that are likely to impact the project's execution.

In this regard, it includes maximizing the risks that will have a positive effect on the project while minimizing the risks that will have a negative impact. Since all projects are vulnerable to risks, proper risk management does not stop, but rather institute steps to deal with them to ensure the project's success. Risk management is a wide and important area that requires skilled and competent staff to address the challenges that come with project management. Since risks vary in size and effect on a project, the project manager must consider all aspects of the project to ensure that no risk is overlooked.

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1. **Importance of risk management**

All project management disciplines address project uncertainties in some way, either by preventing risks from occurring or by reducing their magnitude. For example, creating a work breakdown structure (WBS) aids in the understanding of the project scope, allows for project tracking and control. As a result, some of the inconsistencies that might arise are sorted out, and the project's risks are reduced. The development of an Organization Breakdown Schedule and a Cost Breakdown Schedule are two other factors that lead to the reduction of project risks. Although each of these disciplines is thought to help reduce project risks, risk management is the one that has the most direct effect on project risks and outcomes.

Project managers may also use risk management to identify possible project risks and develop the appropriate risk management plans to mitigate these risks. Planning is an important aspect of risk management because it aids project managers in comprehending the effect of each risk on the project and how these consequences influence the project's development.

Understanding the types of risks that are likely to impact a project will help the project manager plan for and convey the impending challenges to the project's stakeholders. As a result, it is possible to delegate risks to individuals and begin handling them right away, from the start of the project until it is completed.

Risk management reduces or fully removes the incidence of risks by implementing mitigation steps. This allows the project to be prepared ahead of time, avoiding any unexpected surprises during the project's implementation. Furthermore, it helps save time that would otherwise be spent struggling with risks after they arise abruptly.

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1. **Risk Management Process**
   1. **Risk Management Planning**

It mainly entails decisions on how to approach, schedule, and execute risks within a project. This is critical to the project because it establishes a balance between the project's risks and its importance to the company. Prior to the start of the project, the project manager must have a thorough understanding of the organization’s policies about the risk management and the organization structure adopted. This is because risk decisions follow the organization's policy, and it's important to consider how the decision-making structure will impact the project before preparing for risks. To assist in the assignment of risks once they have been identified, project managers must also recognize the positions and responsibilities within the organization that have been predefined by the organization to help in the assigning of risks after they have been identified. Prior awareness of the stakeholders and their tolerances, as well as the project's work breakdown plan are also helpful. This will go a long way toward identifying some of the project's most significant risks. The creation of a project charter, which provides a description of the project and a skeleton by which issues related to the project can be defined, is one of the documents needed at this point. At this point, a risk management plan is also essential, and it should include the following things,

* Provide a description of the risk management approach that will be used.
* Outline the risk management functions and responsibilities. In this case, it should include the roles that each team member would play in addressing the project's risks.
* Estimate the cost of implementing the risk management strategy.
* Indicate the pace at which the project's risk evaluation will be performed.
* Create a risk scoring matrix to represent the various risk levels.
* Demonstrate the point at which the danger becomes a threat to the project and is hence included in the risk management strategy.
* Show how the project's risk responses will be carried out to avoid delays.
  1. **RISK IDENTIFICATION**

It entails identifying the threats that are likely to influence the project and enumerating some of their characteristics. The project team, partners, customer, and other external parties are all important players in the risk identification process. This is a critical stage in risk management that should be given greater attention because it will decide whether the project is to capture all the risks involved. To discover all the likely risks associated with a project, an accurate analysis of the risks must be implemented. The use of a risk management strategy alongside the project charter, WBS, project outline, costing estimates, procurement plans, and all the constraints likely to impact the project are some of the essential aspects that are instrumental in successful risk identification. With this knowledge at hand, the project team will be able to identify all sources of risk and take the necessary steps to minimize them.

To define as many risks as possible, the project manager and the project team should organize the risks into categories. This will benefit the project because the more risks there are, the better the project will be because there will be adequate buffers to avoid them from occurring or reducing their effect on the project to a manageable extent. Brainstorming, conducting expert interviews, and conducting a SWOT analysis are some of the approaches that can be used to identify threats, among the many choices available to facilitate this exercise. Without the inclusion of seniors to assist in the rigorous and effective execution of the exercise, risk detection would be incomplete.

To allow for careful preparation, risk identification must also include the identification of the causes for each risk. Triggers serve as stronger indicators that indicate where there are signals for the occurrence of a specific risk, allowing the project team to address the problem either by acknowledging the risk's occurrence, assigning liability to another group, or working to minimize the risk's effect on the project's progress.

* 1. **QUALITATIVE RISK ANALYSIS**

It involves a series of procedures for evaluating the impact and the probability of incidence of the identified risks for the project. the main consideration is that the project objectives, that form the backbone of the project and provides a summary of what the project is bound to encompass. As a result, it prioritizes risks based on the likelihood of their effect on the project. The risks vary from project to project, depending on the important issues that must be addressed. For example, in a project with limited time, time becomes a key factor, while in a project with a budget, cost becomes a major concern. To arrive at this, all risks must be assessed and evaluated using the available data and in relation to the project objectives. This would go a long way toward ensuring that risks with a higher likelihood of occurrence are given more weight than risks with a lower likelihood of occurrence.

The decision probability and effect are two methods that could be used in this situation. This scale aids in the classification of risks based on their probability of occurrence and effect on the project's outcome. Furthermore, a chance or effect risk level matrix based on a scale of very low, low, moderate, high, and very high should be used. All of this is done in order to have a stronger foundation on which to rank risks and establish mitigating strategies until they have a negative effect on the project. The likelihood scale normally ranges from 0 to 1.

It is also critical that during the evaluation, all project assumptions are assessed for their stability in relation to the project's likely effects. Other alternative assumptions must also be established and checked to ensure that the selected assumptions do not jeopardize the project.

* 1. **QUANTITATIVE RISK ANALYSIS**

It is a procedure that entails a numerical analysis of the likelihood of each project risk occurring, as well as its implications and magnitude. The simulation technique is one of the most widely used methods for estimating the likelihood of achieving all of the project's goals, quantifying risk exposure, defining crucial risks that need additional attention, and providing an overall evaluation of the project's costs and timelines to determine if they are feasible and achievable.

* 1. **RISK RESPONSE PLANNING**

It is a process that entails the creation and determination of measures that are deemed to create opportunities and adequately mitigate risks to the project's objectives being met. It includes understanding risks and appointing people to oversee handling them. This is also an important step in risk management because the project team's response to the risks found for the project would decide whether the risks have a negative impact on the project's progress. To run the project efficiently and effectively, the risk response should encourage productivity and cost effectiveness.

Any risk should be delegated to someone who can handle the risk properly and raising an alarm if there are signs of the risk occurring early enough for proper action to be taken. Competence is, in essence, an element to consider when assigning risks to individuals. For each danger, there are a variety of possible responses as below,

* + 1. **Avoiding**

Where a risk is considered uneconomical to consider and harmful to the project, the safest option is to eliminate the risk-related operation as much as possible. This could necessitate a reevaluation of the project's methods and the development of alternative design options, or even a complete redesign of the project. This is possible for the risks that can be expected at the start of the project, allowing for the requisite improvements to be implemented prior to the project's start.

* + 1. **Transferring**

It implies transferring the risk responsibility to a third party. It may be from a client to a designer, a client to a contractor, a contractor to a subcontractor, or a client, designer, contractor, and subcontractor to an insurance company. In most situations, the risk is transferred to the group who is best equipped to deal with it. Financial risks are the most common risks that involve transference. When you transfer your plan to an insurer, it is necessary to pay your payment on time.

* + 1. **Mitigation**

It includes taking appropriate steps to reduce the risk's probability of occurring and its effects on the project. This will entail a range of steps that will significantly reduce the risk's effects. Where a risk is expected to happen, mitigation steps can be taken to mitigate the risk's effect on the project.

* + 1. **Acceptance**

It involves the project team choosing to handle risk to the project's benefit by concentrating on the risk's positive effect on the project and attempting to contain the risk's negative impact. It is normally an option when the project team is unable to pass the risk to a third party or when avoiding the risk is difficult.

* 1. **RISK MONITORING AND CONTROL**

This is a phase that begins at the beginning and continues until the project is completed. It involves monitoring the defined risk, keeping track of residual risks, detecting new risks that arise throughout the project's implementation, and evaluating the efficacy of risk reduction measures adopted.

It also includes putting in place appropriate contingency strategies for coping with risks to produce better outcomes. Effective monitoring and control will provide crucial information for better and more productive risk management. The following are the goals of risk monitoring and control:

* Assuring that risk responses have been implemented properly and correctly.
* The adopted risk responses are as successful as intended, and new responses are established where this is not the case.
* Determining the project assumptions' validity.
* Monitoring the frequency of risk factors to develop better ways to deal with them.
* Ensuring that risk management is done in the best ways possible by adopting proper procedures and following the necessary protocol.
* Developing new approaches to risk management that are more efficient.

1. **EFFECTIVE RISK MANAGEMENT**

The success of a project is influenced in part by how risks are handled. Risk assessment and risk control are the two most important elements of risk management that must be carefully evaluated to ensure performance.

* 1. **RISK ASSESSMENT**

It consists of three main components: defining project uncertainties, analyzing project threats, and prioritizing risks. In this regard, all three elements are critical and must be considered,

* + 1. **Identifying uncertainties and constraints**

The project team must investigate the project plans to identify all potential risks to the project. This should be presented in a more detailed manner, with less generalizations. The project manager should ensure that all specific uncertainties are identified in this regard. Project uncertainties, industry uncertainties, weather uncertainties, company uncertainties, cost related uncertainties, resource uncertainties, subcontractor performance uncertainties, litigation uncertainties, contracting uncertainties, letting, or selling uncertainties, and interest rate uncertainties are some of the popular uncertainties affecting projects. When all of these areas have been analyzed and brainstormed, it is likely that all of the project's crucial uncertainties can be recognized and addressed.

* + 1. **Analyzing the risks**

All defined risks should be analyzed based on their probability of occurrence and extent of impact on the project, according to effective risk management. This will allow you to recognize the risks that are most likely to arise, as well as those that have the greatest impact on the project. Risks can then be classified because of this,

- High probability, high impact

- Low probability, high impact

- High probability, low impact

- Low probability, low impact

* + 1. **Prioritizing risks**

Prioritize the risks that have the highest likelihood of occurring and having the greatest effect on the project. Better steps should be taken where necessary to mitigate their effect on the project. Furthermore, the project management must ensure that such risks are identified and mitigated before they have a significant impact on the project's progress. Risks with a low likelihood but a high impact on the project should be closely monitored to ensure they do not obstruct the project's progress. It's also important to keep an eye on those risks that have a high chance of occurring, but not too closely. Risks with a low likelihood of occurrence and low impact on the project, on the other hand, may be overlooked because they are unlikely to occur and, even if they do, would not have a significant impact on the project.

* 1. **RISK CONTROL** 
     1. **Mitigating Risks**

After the risks have been identified and analyzed, the project team must brainstorm and consider better ways to minimize them.

* + 1. **Planning for emergencies**

It is possible to identify the areas that are essential to the project after a detailed evaluation. To ensure that the project does not collapse in the worst-case scenario, appropriate precautions must be placed in place to ensure that the most feared risks do not arise.

* + 1. **Measuring and controlling**

It's impossible to have power over something that can't be measured. In this regard, it is critical that individuals be delegated to manage risks after they have been assessed. This will assist in keeping track of the risk and receiving timely alerts so that the risks do not influence the project.

1. **CONCLUSION**

This paper has highlighted the concept of overall project risk that has featured in Project Risk Management guidelines for the past decade (Association for Project Management, 2004), but which is largely ignored by most project-based organizations. These tend to prefer to focus on handling specific risks within their projects rather than discussing the project's overall riskiness. Even though they include the term in their descriptions, the main project management associations' Project Risk Management processes do not clarify how to handle overall project risk.

It is obvious that project managers must be able to respond to the question, "How risky is this project?" To date, responses have been focused on different aggregations and summaries of a list of individual risks, which do not offer a reliable indicator of a project's overall riskiness.

The definition of overall project risk is explained in this document, along with how it can be detected, measured, and handled. The question is whether project-based organizations can take on the task of putting this paper's advice into practice and start addressing risk at the project level rather than just individual risks. This dual integrated approach might be called holistic risk management, reflecting the fact that it deals equally with the risks in the project as well as the risk of the project.

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