**SOFTWARE ENGINEERING**

**(IT-314)**

**EVENT PLANNER APPLICATION**

Risk Mitigation, Monitoring and Management Plan

Version 1.0

**Team no: 14**

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1. **Introduction**
   1. **Purpose**

The purpose of this Risk Monitoring,Management and Mitigation Plan (RMMMP) is to describe the process for identifying, tracking, mitigating and finally reducing the risks that are involved in the project.

This will be achieved by following a well defined process utilizing the tools and techniques described in this plan.The following are the activities that must be done in order to resolve the risks and continue with the project.

* Risk Identification
* Risk Analysis
* Risk Management and Mitigation
* Risk Review and Monitoring
  1. **Scope**

The scope of this document is limited to the risk mitigation, monitoring and management of the Event Planner Application that we are designing. The methodologies described in this document will be used for the same.

1. **Risk Management Procedure**
   1. **Risk Management Procedure Overview**

Risks are future adverse events which may be responsible for a potential loss or delay. There is some probability associated with it.If the probability is high it will cause more damage to the project. If the probability is less we can reduce the effects caused by these risks**.** It is an unfavorable event or circumstance that can occur during the project life cycle which can affect the delivery of project in cost and time effective manner.To avoid this,we will include Risk Management Plan in the lifecycle of Software Development Process. By this if any risk happens in future we should be capable of reducing the risks by reviewing this document.For this we will make a list of all the risks that might happen in the development and approach of how to solve these risks and the probability of the damage caused by a particular risk.

* 1. **Risk Identification**

The process of solving the risks starts with the risk identification.We should identify the root which is causing risks.In a project generally risks happens due to wrong assesment of a particular phase.

Risks are classified into 3 types.

**Project Risks:**

They affect the project plan. If they become real, it is likely we will miss the deadline of particular project and cost will increase.

**Technical Risks:**

They affect the quality and performance of the project. If they become real, implementation may become difficult or impossible.

**Business Risks:**

They affect the viability of the software to be built. If they become real,they jeopardize the project. The following list consists of the types of risks.

|  |  |
| --- | --- |
| **Types of Risks** | **Root of Risk** |
| Feasibility Report | 1)Wrongly estimating the feasibility of the product it involves uncertain product size,capability of the team members,time span of the project. |
| Requirements | 1)Proceeding with the ambiguity in the Requirements. |
| Design | 1)Since the requirements are not clear the design out of that will be wrong design.Sometimes if we are clear with the requirements we might not design the design reflecting the requirements. |
| SDLC model | 1)If we not follow proper SDLC model the costs will go up and time and efforts will be wasted will results schedule risks. |
| Time Risks | 1)Wrongly estimating the time required for individual events in the projects which results in overall delay. |
| Sequence Risks | 1)Changing the order to be followed according to the Software Engineering Process.For example,writing the test cases at the end of coding may not include some test cases. |
| Technical Risks | 1)Assuming the team members are technically sound.  2)If the requirements are changed we might not implement them with the existing technology.  3)If the software involves learning of new tools the project may be delayed because different people have different learning abilities. |
| Operational Risk | 1)No communication in team  2)Faulty Work Distribution  3)Conflicts among team members |
| Customer Risk | 1)Lack of adequate involvement of customers |
| Planning and control | 1)Project being not closely observed  2)Poor project planning due to inexperienced candidate. |
| Performance Risk | 1)All the modules are working correct but the integrating these modules might slow down the performance. |
| Unavoidable Risks | 1)Due to change in government policy |
| Budget Risks | 1)Wrong budget Estimation  2)Cost overruns  3)Project scope expansion |

Apart from these there are unavoidable risks.These risks are not predicted in advance.Some of the unpredictable risks are:

* Government to change the policy of the taxation to be paid.
* Shifting the deadline of exams in college level projects.
* Employee leaving the organisation due to his personal reason.
  1. **Risk Analysis**

After Identifying the risks we should be followed with Risk analysis.This will mainly describes about the probability of the occurrence of the risk.There are predictable risk and unpredictable risks.

Three factors affect the consequences that are likely if a risk is occurred.

**Nature of the Risk:**

This indicates the the problems that are likely if a risk does occur.

**Scope of the Risk:**

It tells regarding the severity and how the project is affected due to that risk.

**Timing of the Risk:**

This considers when and how far the impact of the Risk continues. The probability and the impact of the risk is measured by three types.

1. **Qualitative Analysis:**

Qualitative Analysis will determine probability of occurrence and magnitude of impact using the standard labels defined in the risk tool to derive an overall risk rating for each identified risk event. The risks are classified into high,medium,low based on their on the probability of their occurrences.

**High:** It is almost certain or very likely that the risk will occur. There is approximately 70% or higher confidence level that the risk will occur.

**Medium:** It is somewhat probable that the risk will occur. There is approximately a 30-70% confidence level that the risk will occur.

**Low:** It is unlikely or improbable that the risk will occur. There is approximately a less than 30% confidence level that the risk will occur.

**2) Quantitative Analysis :**

Quantitative Analysis will use the probability percentage associated with the chosen probability label in the risk tool and estimate the magnitude of the impact to determine the expected value.

Expected Value(E.V)=Probability \* $ Impact.

Probability comes from Qualitative Analysis.

Impact comes from Quantitative Analysis.

**3) Risk Prioritization :**

Analyzed risks will be prioritized to identify the top risks with threats and opportunities ranked separately based on the Qualitative overall risk rating and Quantitative expected value rating.

**Risk analysis Table :**

A Risk table provides a project manager with a simple technique for risk projection.

|  |  |  |  |
| --- | --- | --- | --- |
| **Risk Summary** | **Risk Category** | **Probability** | **Impact** |
| 1)Wrongly estimating the feasibility of the product it involves uncertain product size,capability of the team members,time span of the project. | Feasibility Report | Low | Medium |
| 1)Proceeding with the ambiguity in the Requirements. | Requirements | Medium | High |
| 1)Since the requirements are not clear the design out of that will be wrong design.Sometimes if we are clear with the requirements we might not design the design reflecting the requirements. | Design | High | High |
| 1)If we not follow proper SDLC model the costs will go up and time and efforts will be wasted will results schedule risks. | SDLC model | Low | Medium |
| 1)Wrongly estimating the time required for individual events in the projects which results in overall delay. | Time Risks | High | Medium |
| 1)Changing the order to be followed according to the Software Engineering Process.For example,writing the test cases at the end of coding may not include some test cases. | Sequence Risks | Low | Medium |
| 1)Assuming the team members are technically sound.  2)If the requirements are changed we might not implement them with the existing technology.  3)If the software involves learning of new tools the project may be delayed because different people have different learning abilities. | Technical Risks | High  Low | Medium  High |
| 1)No communication in team  2)Faulty Work Distribution  3)Conflicts among team members | Operational Risk | Medium  Low | Low  Medium |
| 1)Lack of adequate involvement of customers | Customer Risk | Medium | Low |
| 1)Project being not closely observed  2)Poor project planning by team leader. | Planning and control | Medium  Medium | Medium  Low |
| 1)All the modules are working correct but the integrating these modules might slow down the performance. | Performance Risk | Medium | Medium |
| 1)Due to change in government policy  2)Due to change of other events schedule.  (example: shift of end sem exams) | Unavoidable Risks | High  High | High  High |

* 1. **Risk Planning**

Once we are clear with the roots of the actions that are causing risks, probability of the risks and the impact resulted when an risk occurs.We should develop a strategy by which we can control the adverse effects caused by these risks.

The following are the strategies which are followed in general

**1) Prevention:** Prevention refers to the prevention of risks at the early stages of risks.If the prevention takes too long,prevention becomes too costly and sometimes impractical.During this stage,we should employ experienced people to prevent the happening of risk.

**2) Mitigation:** This strategy is followed once the risk occurred,here we will examine the probability and the impact of the risks and try to reduce the risk to the acceptable level. “Prevention is better than cure” in the same way “Prevention is better than Mitigation”

**3) Contingency:** Developing contingency plans helps us to define the plan of action and to build a strategy to follow if a risk occurs.By this we can efficiently allocate the remaining resources to manage those risks.

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| --- | --- | --- | --- | --- |
| **Sr. No.** | **Root of the Risk** | **Prevention** | **Mitigation** | **Contingency** |
| 1 | Wrongly estimating the feasibility of the product and scope of the project. | Feasibility must be done by keeping realistic capabilities of team members and scope of the project in mind. | Have well defined and documented scope of the project to be implemented and estimate the realistic capabilities of the team members. | Employ some new employee to perform tasks which are cannot be done by the existing team members and make some changes in the project so that the scope can be increased. |
| 2 | Proceeding with the ambiguity in the Requirements. | Before writing SRS we should make sufficient meetings with the client so that we will have a better idea on requirements.Discuss these with the team members and if there is any ambiguity in the requirements again discuss with the client. | Document the requirements in proper order.So that we will get clarity in which requiremnts we are facing problem.Discuss these requirements again with the client. | Reevaluating and revising the requirement analysis to resolve ambiguity. |
| 3 | Design | Review the requirements while starting the design phase and create a proper documentation for the requirements which is easily understandable by the design team. | Review the design phase and relate with the requirements documents. | Management and  review of the  work that has already been  completed based  on the design  plans and the remaining  work to be  completed  successfully. |
| 4 | Proper SDLC model | Analyse all the SDLC models and apply them to project and analyse which model suits them analyse the pros and cons of the models. | Compare with the series of steps that are going on with the model and also compare with the time and budget allotted for the particular phase.If there is something wrong review the SDLC model and change the model following. | Review the presenting following SDLC model and make necessary changes. |
| 5 | Wrongly estimating the time required for individual events in the projects which results in overall delay. | Set the deadlines that are realistic that means they can be meet with in the given time.Set these deadlines with respect to the team members. | Review the deadlines and reallot them by distributing with other members. | Review the deadlines and set new deadlines with respect to the work left. |
| 6 | Changing the order to be followed according to the Software Engineering Process. | Have a well-defined process for development. | There are many methods for keeping track of the project follow one model and make that is in sync with the sequence that is going on. | Reorganising the process followed will bring back the project development plan in to track. |
| 7 | Assuming the team members are technically sound | Make note of what the people can do by analysing their capabilities do not go for unrealistic assumptions. | Group with other people who have knowledge in that language and they will help other people when needed. | Review the team members ability and list the tools that they are good at and assign work. |
| 8 | If the requirements are changed we might not implement them with the existing technology. | Make sure that the requirements are fixed or there is any addition of the requirements in future.Try to implement the design such that there are minimum change in the design when there is a change in requirements. | Analyse the design phase and try to make minimal change which incorporates or allows the addition of new requirements. | Try to develop the requirements with the existing technology. |
| 9 | If the software involves learning of new tools the project may be delayed because different people have different learning abilities. | Give sufficient time for learning the tools by keeping in mind of all the team members capabilities. | Group with the other people so that if there is any doubt they can clarify. | Redistribution of  tasks to people  with better  knowledge and  experience of  using the  software tools  and technologies |
| 10 | If the employee leaves the organisation due to his personal problems | Maintain one person in extra for every project.So you can manage the task with the extra person. | Divide the left person task with the talented people and make sure you employ new employee with in no time.Search for the person who have an idea of the tools which are currently being used in the project. | Make a contract to not leave the organisation until the project is completed. |
| 11 | No communication in team | Properly communicating on a project is very necessary for managing the clients. | Proper interaction and sharing of thoughts with the team. | Try to analyse the problem them are facing among them and try to resolve it. |
| 12 | Faulty Work Distribution | Analyze and list the team members capability.  Their skillsets and the tools they are familiar with. | Detailed discussion among the team members about the skills they have and reassign with appropriate tasks. | Reassign the tasks based on clear understanding of skill sets of the team members. |
| 13 | Conflict among team members. | Having healthy  debates and  discussions and  following a  defined process  for coming to  conclusions on  the issues at  hand. Working in  a friendly and  ethical manner. | Better  communication  and discussion  among the team  members about  their thoughts  and ideas  regarding the  task at hand | Resolving the  conflict amicably  to reach a  conclusion with  no grudges  among the team  members |
| 14 | Lack of adequate involvement of customers | User involvement to gather information to meet users expectations. | Gather user response by sharing the development within the project. | Once a module is designed show it to the client and ask for his review. |
| 15 | Project being not closely observed | All the documents should be reviewed, keeping track of project’s progress | Manage the work plan, the order of the work, the work that needs to occur | Project Manager should keep the work plan up to date and how to complete the remaining work at any particular point |
| 16 | Poor project planning due to inexperienced candidate. | Mention start and end dates and the choice of Software Development Life cycle model in project plan | Defined process to be followed and project work should successfully be completed within the mentioned deadlines | Once we have noticed that project is going wrong discuss it with team members and make necessary changes. |
| 17 | All the modules are working correct but the integrating these modules might slow down the performance. | Developing  proper unit and  integration test  plans | Execute the unit  and integration  test plans to  figure out the  error, and  resolve it. | Try to find  alternative  module or make  changes in the  code of the given  problematic  module |
| 18 | Wrong budget Estimation | The budget must be prepared with the involvement of experienced guy.Discuss the budget with the other people in the group and make necessary changes. | Review the budget make necessary changes in the allotment of budget. | Review the budget and ask for experts solution and plan the part of the project left efficiently with the remaining funds. |
| 19 | Cost overruns | Plan the amount that must be spend for every phase. Always keep an amount in extra in case a particular phase is overruns the allocated cost. | If the cost overruns try to reduce the costs given to the other phases and give that portion to the present phase. | Manage with the existing funds by properly planning for the remaining phases or ask for some extra funding. |

* 1. **Risk Monitoring and Control**

Risk monitoring control is the process of keeping track of the identified risks, monitoring residual risks and identifying new risks, ensuring the execution of risk plans, and evaluating their effectiveness in reducing risk. Risk monitoring and control records risk metrics that are associated with implementing contingency plans. Risk monitoring and control is an ongoing process for the life of the project. The risks change as the project matures, new risks develop, or anticipated risks disappear.

Good risk monitoring and control processes provide information that assists with making effective decisions in advance of the risks occurring. Communication to all project stakeholders is needed to assess periodically the acceptability of the level of risk on the project.

**Risk Status**

The risk status assigned to each risk changes over the project’s life cycle. The risk statuses are defined as:

* Analysis complete – Risk analysis is done but response planning not yet performed.
* Response Planning complete – Response planning complete
* Triggered – Risk trigger has occurred and threat has been realized.
* Resolved – Realized risk has been contained.
* Retired – Identified risk no longer requires active monitoring, that is, the risk trigger has passed.

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| **Sr. No.** | **Root of the Risk** | **Monitoring and Control** | **Risk Status** |
| 1 | Wrongly estimating the product size and time span of the project. | Make appropriate changes to the required documents and the project plan and shift the deadlines accordingly. Also, employ extra effort to reach a compromise. | Response Planning complete |
| 2 | Ambiguity in the Requirement Analysis. | Talks with the client to ensure that requirements are as per his needs and taking feedback. | Retired |
| 3 | Client changes requirements | Discussion with client about new requirements and making appropriate changes to the project plan and other documents. | Resolved |
| 4 | Wrong choice of SDLC model | Proper monitoring while initially choosing the model. If problem still occurs, inspection of the best model to be followed for the remaining work. | Response Planning complete |
| 5 | All requirements not reflected in design phase or interpreted. | Take proper care while making design documents and review both design documents and requirement specifications after completion to ensure no requirement is left unsatisfied. | Retired |
| 6 | Problem in meeting the deadlines and milestones due to lack of time | Keep a contingency time slot and increase efforts to ensure that deadline is not overshot. | Resolved |
| 7 | Not following the Software Engineering Process. | Properly monitor the work done and ensure it is in accordance with the required standards by strict reviewing. | Resolved |
| 8 | Assuming the team members are technically sound | Providing enough time window for learning the indispensable skills. | Resolved |
| 9 | No communication in team | Make meetings mandatory and encourage members to post updates of every work unit completed to keep the others in the loop. | Resolved |
| 10 | Unavailability of team members. | Transfer and distribute work amongst those available and make sure progress is strictly monitored. | Resolved |
| 11 | Problems with work distribution | Distribute work according to the appropriate skill set of the members. | Resolved |
| 12 | Conflicts among team members | Ensure a healthy work environment to minimize these and give time for the matter to cool down before resolving it on a neutral ground in case risk still occurs. | Response Planning complete |
| 13 | Not involving the client in the project. | Take appropriate feedback at required stages for ensuring client involvement. | Resolved |
| 14 | Poor project planning by team leader. | The other members should provide critical opinions in case planning and management needs to be altered. | Retired |
| 15 | All the modules are working correct but the integrating these modules might slow down the performance. | Analyse which module is affecting performance and make appropriate changes. | Response Planning complete |

1. **Roles and Responsibilities**
   1. **Project Team - Team 14**

Project team members participate in the risk identification process and discuss risk monitoring and mitigation activities in team meetings.The particular persons who are in particular phase need to understand the risk and try to reduce the risk.

* 1. **Client: ALL ABOUT ADS**

Clients participate in risk identification and risk activities, by providing risks input, and supporting risk mitigation planning and executing activities. As the project has live client they also receive escalated risks and assist with mitigation and contingency actions for escalated risks and cultivate a culture that rewards early identification and treatment of risks and other related issues.

1. **References**

* Risk Mitigation Monitoring Management Plan v1.0, Team 7, IT314 Software Engineering, Winter 2012-13, DA-IICT.
* CDC\_UP\_Risk\_Management\_Plan\_Template.doc