**RISK MANAGEMENT PROCESS**

# A. Goal

* Identify the risks that may occur and influent on project and organization.
* Have a corrective action plan to deal with each risk when it occurs.
* Ensure the project is complete on time and within budget, the quality project is ensured.
* If we do not plan for risk mitigation, the risks will become crisis and we cannot control it. There are a lot of risks in project so that we need to know which risks is the most important and which one is not to have appropriate corrective action

# B. Risk Management Process

## 1. Roles and responsibility in risk management process

* Three roles account for risk management

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| **ROLE** | **RESPONSIBILITY** |
| **Project Manager** | - Monitor the progress and notice the trigger to recognize the risk base on the risk board which have defined at the beginning of project  - Assign the risk to appropriate owner because the project manager cannot manage all risks alone. |
| **Team members** | - Providing project risk management team with necessary information  - Assisting with the implementation of action plans as specified by the project risk profile owners  - Reporting any new risks that might appear during the life cycle of the project to the project risk management team. |
| **Key stakeholders** |  |

## 2. Process description

**RISK MANAGEMENT PLANNING**

These process interact with each other and with the process in the other areas

Each process generally occur at least once in the project

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| **RISK MANAGEMETN PLANNING** | |
| ***Purpose*** | * The process decide how approach and plan the risk management activities for a project * Ensure that the level, type and visibility of risk management are commensurate with both the risk and importance of the project to the organization |
| ***Input*** | Defined roles and responsibilities  Templates  Work breakdown structure (WBS) |
| ***Tool & techniques*** |  |
| ***Output*** | Risk management plan:   * Methodology * Role & responsibility * Timing * Scoring & interpretation * Thresholds * Reporting format   Tracking |
| **RISK IDENTIFICATION** | |
| ***Purpose*** | * Determining which risks might affect the project and documenting their characteristics * Participants: project team, risk management team, project manager, primary stakehoders * It is an iterative process. The first iteration may be performed by a part of the project team/the risk management team. The entire project team and primary stakeholders may make a second iteration. * Often simple & effective risk responses can be developed and even implemented as soon as the risk identified. |
| ***Input*** | Risk management plan  Project planning outputs  Risk categories |
| ***Tool & techniques*** | Documentation reviews  Information-gathering techniques  Checklists  Assumption analysis |
| ***Output*** | Risks  Triggers  Inputs to other processes |
| **RISK ANALYSIS** | |
| **QUALITATIVE RISK ANALYSIS** | |
| ***Purpose*** | * The process of assessing the impact and likelihood of identified risks * Priorities risks according to their potential effect on project objectives * Determine the importance of addressing actions may magnify the importance of a risk * Help modify the assessment of the risk * Analysis requires that the probability and consequences of the risks be evaluated using established qualitative analysis methods and tools * Qualitative analysis should be revisited during the project’s life cycle to stay current with changes in the project risks |
| ***Input*** | Risk management plan  Identified risks  Project status  Project type  Data precision  Scales of probability & impact  Assumptions |
| ***Tool & techniques*** | Risk probability and impact  Probability/impact risk rating matrix  Project assumptions testing  Data precision ranking |
| ***Output*** | Overall risk ranking for the project  List of prioritized risks  List of risk additional analysis & management  Trends in qualitative risk analysis result |
| **QUANTITATIVE RISK ANALYSIS** | |
| ***Purpose*** | * The quantitative risk analysis process aims to analyze numerically the probability of each risk and its consequence on project objectives. Give decision analysis to: * Determine the probability of achieving a specific project objective * Quantify the risk exposure for the project, and determine the size of cost and schedule contingency reserves may be needed * Identify risks requiring the most attention by quantifying their relative contribution to project list * Identify realistic and achieve schedule, scope targets |
| ***Input*** | Risk management plan  Identified risks  List of prioritized risks  List of risks additional analysis and management  Other planning inputs |
| ***Tool & techniques*** | Interviewing  Sensitivity analysis  Decision tree analysis  Simulation |
| ***Output*** | Prioritized list of quantified risks  Probabilistic analysis of the project  Probability of achieving the cost and time objectives  Trends in quantitative risk analysis results |
| **RISK RESPONSE PLANNING** | |
| ***Purpose*** | * The process of developing options and determining actions to enhance opportunities and reduce threats to the project objectives * It includes the identification and assignment of individuals or parties to take responsibility for each agree risk response |
| ***Input*** | Risk management plan  List of prioritized risks  Risk ranking of the project  Prioritized list of quantified risks  Probabilistic analysis of the project  Probability of achieving the time objectives  List of potential responses  Risk thresholds  Risk owners  Common risk causes  Trend in qualitative and quantitative risk analysis results |
| ***Tool & techniques*** | Avoidance  Transference  Mitigation  Acceptance |
| ***Output*** | Risk response plan  Residual risk |
| **RISK MONITORING & CONTROL** | |
| ***Purpose*** | * The process of keeping track of the identified risks, monitoring residual risks & identify new risks, evaluating effectiveness in reducing risks. |
| ***Input*** | Risk management plan  Risk response plan  Project communication  Scope changes |
| ***Tool & techniques*** | Project risk response audits  Earn value analysis  Technical performance measure  Addiction risk response planning |
| ***Output*** | Corrective action  Project change requests  Update to the risk response plan  Risk database  Updates to risk identification checklist |

### RISK MANAGEMETN PLANNING

**Risk source**

| **No.** | **Source of risk** | **Description** |
| --- | --- | --- |
|  | **Requirement** | This source covers risk introduced due to different attributes of the requirement elements such as -- Stability, Completeness, Clarity, Validity, Feasibility, Precedent and Scale. |
|  | **Design** | It is "Translation of requirements into effective design". Design covers the risk introduced due to following attributes - Functionality, Difficulty, Interfaces, Performance, Testability, Hardware Constraints and Non developmental Software. |
|  | **Code & Unit Test** | It is "Translation of software design into code that satisfies the specified requirements. This source covers risk introduced due to following attributes -- Feasibility, Unit Test and Coding/Implementation. |
|  | **Integration & Test** | It is “Integration of code into a system and the validation that the software performs as required. This source covers risk introduced due to following attributes -- Environment, Product & System |
|  | **Engineering Specialties** | It is a set of Product requirements or development activities that may need specializes expertise such as -- Maintainability, Reliability, Safety, Security & Human Factors |
|  | **Development Process** | It is the definition, planning, documentation, suitability enforcement and communication of the methods & procedures used to develop the product. This element groups risks due to -- Formality, Suitability, Process control, Familiarity & Product Control. |
|  | **Development System** | It addresses the hardware and software tools & supporting equipments used in product development. The risk for this source may be due to -- Capacity, Suitability, usability, Familiarity, Reliability, System Support and deliverability. |
|  | **Management Process** | It address the risks related to following attributes -- Planning, Project Organization, Management Experience & Program Interfaces. |
|  | **Management Methods** | It refers to the methods for managing both the development of the product program personnel. It groups risks related to following attributes -- Monitoring, Personnel Management, Quality Assurance & Configuration Management. |
|  | **Work Environment** | It refers to the subjective aspects of environment such as -- Quality Attitude, Cooperation, Communication & Morale |
|  | **Resources** | It refers to the factors on which a project is totally dependent upon such as -- Schedule, Staff, and Budget & Facilities. |
|  | **Contract** | Risks related to the contracts are classified according to -- Type of contract, Restrictions and Dependencies. |
|  | **Program Interfaces** | Risks related to other groups that are interfaced with the project --Customer, Suppliers and Corporate management |

**Risk category**

|  |  |  |
| --- | --- | --- |
| **No.** | **Risk Category** | **Description** |
| **1** | **Technical risks** | Risks related to scope, technologies, external dependencies |
| **2** | **Resource risks** | Risks related to people, time, budget & organization |
| **3** | **Process risks** | Risks related to processes define, compliance |
| **4** | **Business risks** | Risks related to competitor, contract and finance |
| **5** | **Customer risks** | Risks related to customer problem |
| **6** | **Others** | Include all risks that are not in the above categories |

### RISK IDENTIFICATION

Trigger Point: Specifically what causes the risk to become a realized issue/problem

Risk Category: Select from categories as defined by the Risk Management Plan

Potential Outcome: What happens if the trigger point occurs

### RISK ANALYSIS

**QUALITATIVE RISK ANALYSIS**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Evaluating Impact of a Risk on Major Project Objectives | | | | | |
| **Project Objective** | **Very Low** | **Low** | **Moderate** | **High** | **Very High** |
| **Schedule** |  |  |  |  |  |
| **Scope** |  |  |  |  |  |
| **Quality** |  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Impact Values | | | | |
| **Very Low** | **Low** | **Moderate** | **High** | **Very High** |
| 0.05 | 0.10 | 0.20 | 0.40 | 0.80 |
| Probability Values | | | | |
| 0.10 | 0.30 | 0.50 | 0.70 | 0.90 |
| Matrix Score – Threshold Values | | | | |
| 0.005-0.08 | 0.05-0.12 | 0.14-0.24 | 0.28-0.56 | 0.72-0.8 |

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| --- | --- | --- | --- | --- | --- |
| **Risk Score for a Specific Risk** | | | | | |
| **Probability** | **Risk Score = P x I** | | | | |
| **0.9** | **0.05** | 0.09 | 0.18 | 0.36 | 0.72 |
| **0.7** | 0.035 | 0.07 | **0.14** | 0.28 | 0.56 |
| **0.5** | 0.025 | 0.05 | 0.1 | 0.2 | **0.4** |
| **0.3** | 0.015 | 0.03 | **0.06** | **0.12** | 0.24 |
| **0.1** | 0.005 | 0.01 | 0.02 | 0.04 | 0.08 |
|  | **0.05** | **0.10** | **0.20** | **0.40** | **0.80** |
| **Impact on an Objective (eg. Cost, time, or scope)**  **(Ratio Scale)** | | | | |

**QUANTITATIVE RISK ANALYSIS**

|  |  |  |  |
| --- | --- | --- | --- |
| **Project Schedule Estimates and Ranges** | | | |
| **WBS Element** | **Low** | **Most likely** | **High** |
| **Design** | 4 |  |  | |
| **Build** | 16 |  |  | |
| **Test** | 11 |  |  | |
| **Total project** |  |  |  | |

### RISK RESPONSE PLANNING

**Risk strategy**

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| --- | --- |
| **Risk Strategy** | **Description** |
| ***Avoid*** | The risk can be avoided by choosing a lower-risk alternative. For example, choose a less exotic technology (but accepting the higher weight), or go with an on-time, more expensive supplier (but accepting the higher cost) |
| ***Transfer*** | The risk will be transferred to another party (customer, external groups,...) for handling |
| ***Mitigate*** | Mitigation seeks to reduce the probability and/or consequences of an adverse risk event to an acceptable threshold. Taking early action to reduce the probability of risk’s occurring or its impact on the project is more effective than trying to repair the consequences after it has occurred. |
| ***Accept*** | The project team has decided not to change the project plan to deal with a risk or is unable to identify any other suitable response strategy |

### RISK MONITORING & CONTROL

**Risk status**

|  |  |
| --- | --- |
| **Risk Status** | **Description** |
| ***Identified*** | Correlative with Risk Identification |
| ***Analysis Complete*** | Correlative with Risk Analysis |
| ***Planning Complete*** | Correlative with Risk Response Planning |
| ***Triggered*** | Correlative with Risk |
| ***Resolved*** | Risk resolved |
| ***Retired*** | Risk retired |

1. Weekly, PM monitors identified risks and new risks. When risk threshold is reached, PM implements the mitigation action(s).
2. Monthly, PM re-assessments the risks that are controlled. If a risk occurred, PM implements the contingency plan(s).
3. If a risk becomes issue, PM records that issue to the Issue List.