## 10.4 Risk Management **[Yeo Zhi Yin, TP035402]**

Project risk is uncertain or random events which has positive or negative effect on project objectives and can occur anytime. Risk can have one or more causes and cause multiple impacts on the project. It can be avoided or mitigated by planning or through pre-emptive action. (Sharma, 2013)

Risk management holds as an important role in IT project when it comes in controlling the quality of the product delivered by the project team. Improper risk management plan will cause a project to fail. Risk management is one of the knowledge areas that required in IT project.

Risk management is a process consist of risk management planning, identification, analysis, response planning and project risk controlling. Leader/Project manager of the team uses this technique to reduce the negative risks and brings benefits of the events that occurred during the project duration.

There are few procedures that can assist the project manager on managing the negative risks during the project which are the following (Institude, 2013):

* Plan Risk Management
* Identify Risks
* Perform Qualitative Risk Analysis
* Perform Quantitative Risk Analysis
* Plan Risk Responses
* Control/Monitoring Risks

With these processes, the team will be able to response with appropriate action the reduce the impact and effect of the risk or even gain positive effect from the risk. Risk should be managed throughout the whole project duration and expecting some unexpected events or problems to be happened during the execution of the project. A project comes with the risk start from initiating phase of project. A calm mind-set or experienced project manager will be more ready when risks happen. Proper risk management planning helps the project progress with less chance of getting negative effects by the risk occurred during the project life time.

**Plan Risk Management**

Project team need to come up with plans that can estimate the possible risks that will be faced by the team during the project. Failure of the previous team that was handling the project would be a good example for references for the current team to develop a risk management plan. Risk management plan consist of how the risk management activities will be carried by the project team. Risk management plan includes few components that will help on identifying risks of a project which are the following (Institude, 2013):

* Methodology
* Roles and responsibilities
* Timing
* Probability
* Impact matrix

The project management has provided the baseline of current situation of the project such as budget, time management, module, human resources. All these resources are needed to be counted in the risk management planning. Project charter provides high-level risk, risk description and high-level budget for the risk management planning. Factors like enterprise environmental, organizational process and stakeholders are needed to be considered in the planning of risk management. (Institude, 2013)

Delphi technique is used on for analysis of inputs of the resources given to the risk management planning as it is the most suitable technique to use. With the Delphi technique we can conclude some suitable resolutions for current situation of the project. Expert judgements from specific fields are used to ensure a well-planned risk management developed by the project team. (Satish, 2015)

Meeting with stakeholders should be conducted frequently to discuss and for them to catch up the progress of the project and issues they are facing in the project.

Risk management team of the project will be using methodology to identify and analyze the risks that will be faced by the project team. Risk manager will have to consider the financial impacts of each risks, opportunities, budget and risk control method.

**Roles & Responsibilities**

|  |  |
| --- | --- |
| Position | Responsibilities |
| Project Manager | Risk Planning |
| Risk control |
| Attend risk meeting and lead the team |
| Financial Manager | Submit financial report to project manager |
| Calculate the risk management cost |
| Procurement Manager | Ensure the tendering process goes smoothly |
| Confirmation on the contracts with vendors |
| Human Resource Manager | Maintains resource power |
| Team Leader | Monitor team members |
| Ensure team members progress speed |
| Submit progress report to project manager |

Project manager should have the highest authority to the project including the control of budget, human resources like organizing man power, making decision for the project team etc. Managers of the departments would have to manage what their department was supposed to do. Other managers from different department should not have higher authority than the project manager. List of responsibilities of respective departments should be stated clearly. Managers from every department should report their progress and report to the project manager frequently to keep up to date.

**Risk Breakdown Structure**

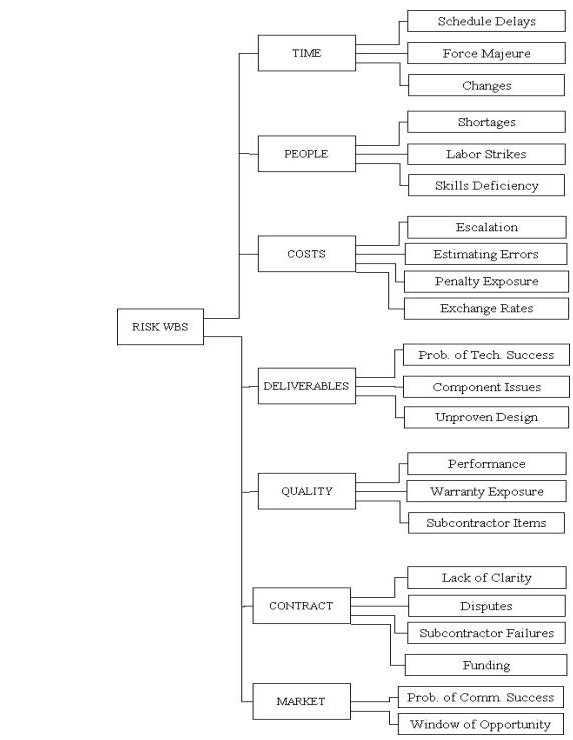


Figure 1https://project-management.com/understanding-the-risk-breakdown-structure-rbs/

**Risk Probability & Impact**

Risk probability are the chances which a risk may occur during the execution of a project.

It is measured by the method of percentage in the probability multiply by impact which is P x I matrix used in the qualitative analysis of risks. Risk impact is the severity level of the impact of the risk to the project. Budget cost, staff health and safety and some critical factor are considered in risk and impact. It is not possible to estimate when will risk happen or how it will happen but by doing analysis on the risks and come out with solutions can help to mitigate the risks or avoid them. Probability x Impact Matrix is used to analyses the risk and categories them into 4 level which is the following (Mind Tools Content Team, 2018).

* - Low impact/low probability
* - Low impact/high probability
* - High impact/low probability
* - High impact/high probability

Risk management process will be done by the risk management monthly to update the risk register since the project has short duration. Risk manager will have to re-asses every risk on the risk register to adjust the solution and update them.

**Identify Risk**

Delphi technique and interview are used to identify the risks which may happen during the duration of project.

Delphi technique, is a forecasting or estimating method based on a discussion by a group of experts (J, 2018). The group are asked to anonymously answer a survey and provide feedback on each other’s answers. The process repeats itself and aim to come up with concrete solutions.

Interviews are conducted between project members, related fields experts and stakeholders to understand what the status of the project is and analyze the situation. Questions will be asked and answered by the interviewee during the interview. The outcome of the interview will be analyzed and added to the risk register.

Situation from the previous team will be analyzed too and find out what was the problem occurred when they was handling the project.

**Risk Register**

Risk register is a documented list of risks that has been identified by the risk manager, It includes potential risks and identified risks. The key components of a risk register are stated below:

* Description of the Risk
* Risk Type (business, project, stage)
* Probability of risk occurring
* Impact of risk
* Risk owner
* Root cause
* Status

Risk register requires opinions from every departments including stakeholders of the system. It must provide framework to the team on how to solve the risk or avoid the risk. Risk register should be reviewed by stakeholders to let them have knowledge on what risks they might face and be prepared for it. If there is any risk that is not identified, they will provide information on the unidentified risk.

**Qualitative Risk Analysis**

Qualitative risk analysis is to identify the severity of the risk in the project by combining the probability and impact of the risk. The purpose of doing this analysis is to allow the control of the risk based of its severity. Risk manager have to come out with a good strategy that can mitigate or avoid the risks during the project.

Probability x Impact matrix will be used in the qualitative risks in the risk register. Risk are assessed with their probability of occurring and the impact of the risk during the project.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Risk Matrix | | Impact | | | | |
| 1 | 2 | 3 | 4 | 5 |
| Probability | 5 | 5 | 10 | 15 | 20 | 25 |
| 4 | 4 | 8 | 12 | 16 | 20 |
| 3 | 3 | 6 | 9 | 12 | 15 |
| 2 | 2 | 4 | 6 | 8 | 10 |
| 1 | 1 | 2 | 3 | 4 | 5 |

Table 1 Risk Assessment Scoring P x I

The probability of risk occur are scaled by the percentage of the occurrence of event where the impact is scaled by the percentage of the impact that will affect the project. The risks are separated into 4 type, the risk under green zone represents marginal risk, blue zone represents minor risk, yellow zone represents moderate risk, brown zone represents major risk and red zone represents critical risk.

**Quantitative Risk Analysis**

Expected Monetary Value (EMV) analysis is the calculation of expected monetary value of a decision given by the probability and the impact of a risk occurred during the project. It is used to calculate the losses or profit by using a table or decision tree diagram. EMV is used in quantitative risk analysis to calculate the cost of an action to address the risks in risk registers. The method to calculate EMV is by using probability multiply by impact.

**Risk Responses**

Each negative risk and positive risk has 4 types of risk response so there are a total of 8 types of risk response.

Negative Risk

Avoid – Changing the project plan to eliminate the risk to protect the project objectives from its impact.

Transfer – Transfer the risk to third party who will carry the risk impact.

Mitigate – Reduce the probability of risk occur and impact to within an acceptable level.

Accept – Do not do anything until the risk happens.

Positive Risk

Exploit – Ensure the risk happens by eliminating the uncertainty.

Enhance – Increase the probability of its occurrence or the impact.

Share – Allocate the ownership to a third party who has higher chance of achieving better result.

Accept – Accept the positive effect but doesn’t commit too much on the risk.

**Risks Control**

Risks identified needs to be controlled by implementing risk response plan. Risk register needs to be updated frequently. New risks which might be threating the project should be identified and prepare risk responses plan for it.

**Risk Register**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Risk ID | Risk Categorization | Risk | Cause | Trigger | Probability | Impact | Monetary Value | Priority | EMV | Response Strategy | Potential Response | Status | Risk Owner |
| 1 | Project Risk | The steering committee do not recall of being presented the project feasibility study by the Project Sponsor or the Project Manager to them. | Miscommunication between project team and steering committee | Steering committee questioning about the budget ,technical and operation issue | 20% | 2 | -$7,000 | 4 | -$1,400 | Mitigate | Present project feasibility study to the steering committee | Open | Project Manager |
| 2 | Project Risk | The project approval was not formally documented. | Packed schedule disallow team members to do the documentation | Documentation is not prepared | 70% | 3 | -$10,000 | 21 | -$7,000 | Mitigate | Have meeting between steering committee to get it formal approval documented | Open | Project Manager |
| 3 | Project Risk | There is no evidence that a proper project management process was followed. | Project manager lacking of managing skill | Documentation and WBS is not done | 30% | 2 | -$7,000 | 6 | -$2,100 | Mitigate | Get WBS up to date | Open | Project Manager |
| 4 | Technical Risk | The PC and server hardware technical specifications were constantly being changed to suit new or added requirements. | Acceptance of additional requirement of system without consideration of the limit | Lack of advanced hardware to support | 30% | 3 | -$10,000 | 9 | -$3,000 | Avoid | Cancel some additional requirement of the system | Open | Business Analyst / Developer Team |
| 5 | Technical Risk | Requirements keep coming in from users almost daily where the GITS-ADC Team Lead keeps on accepting them without hesitation. | Miscommunication between Business Analyst and Developing team | Packed modules causing system cannot finish in time | 30% | 3 | -$15,000.00 | 9 | -$4,500 | Avoid | Cancel some additional requirement of the system | Open | Business Analyst / Developer Team |
| 6 | Schedule Risk | There was redundancy of work performed as the Work Breakdown Structure (WBS) was done separately by each respective department and the Project Manager did not review and then consolidate those WBSs into one holistic WBS. | Miscommunicate between department leads | Departments does not centralize their management | 20% | 4 | -$10,000 | 8 | -$2,000 | Avoid | Conduct review on WBS | Open | Department Leads |
| 7 | Schedule Risk | Most of the team members have been focusing more on their daily operation support rather than tasks being assigned by the Project Manager or their respective Team Lead. | Improper communication method was used to communicate between team members and team lead | Slower progress of the project | 10% | 3 | -$5,000 | 3 | -$500 | Accept | Conduct meeting with discussion on the issues | Open | Team Lead / Project Manager |
| 8 | Schedule Risk | tasks are performed without prioritizing other dependent tasks. | WBS not well scheduled, wrong tasks was prioritized | There is no progress on critical task | 10% | 2 | -$5,000 | 2 | -$500 | Mitigate | Scrum meeting for the tracking on the high priority tasks | Open | Scrum Master |
| 9 | Financial Risk | IT assets acquisition and spending were through PROC Manager with suppliers without going through a proper tendering process. | PROC Manager might be corrupted | PROC manager does not have evidence to show that tendering process is done in a legit way | 10% | 3 | -$10,000 | 3 | -$1,000 | Accept | Request PROC Manager to deal with the supplies in proper tendering process | Open | PROC Manager |
| 10 | Financial Risk | purchasing of IT assets without a proper tendering process has led to overrun by budget. | Lack of comparison between supplier by PROC Manager | Budget are allocated on some unnecessary stuff | 20% | 2 | -$15,000 | 4 | -$3,000 | Avoid | Reduce cost of incoming asserts | Open | PROC Manager |
| 11 | Schedule Risk | the testing plan was not developed yet. | Inexperienced software tester | Quality Assurance Team has slower progress | 40% | 3 | -$10,000 | 12 | -$4,000 | Mitigate | Track and make sure team members finish task on time | Open | Quality Assurance Team Lead |
| 12 | Financial Risk | there was not even a clear designated sponsor (or sponsors) for the project. | Budget planning are poorly documented | Sponsors are not agreeing with the project | 20% | 3 | -$5,000 | 6 | -$1,000 | Avoid | Prepare better proposal or look for other sponsors | Open | Financial Manager |
| 13 | Project Risk | there was no clear project organizational structure to manage the project. | Project manager does not develop an organization structure | Department leads has overridden other department lead’s authority | 30% | 4 | -$20,000 | 12 | -$6,000 | Avoid | Develop an organizational structure | Open | Steering Committee |
| 14 | Project Risk | the Project Manager’s authority was constantly overridden by the department head /managers. | Organization structure is not clearly stated and misunderstanding on authority of department leads | Project manager do not have the authority that match his position | 30% | 4 | -$20,000 | 12 | -$6,000 | Avoid | Let department leas know their authority | Open | Steering Committee |
| 15 | Technical Risk | technical skills were especially lacking in the network and security areas. | Developer team lack of experience | System get attacked by anonymous | 20% | 4 | -$10,000 | 8 | -$2,000 | Transfer | Outsource modules to vendors | Open | HR Department |
| 16 | Project Risk | there were no monitoring reports to review as none were prepared and formally documented. | Team leads did not properly list or inform to the project manager | Lack of documents that supports monitoring job | 30% | 3 | -$5,000 | 9 | -$1,500 | Avoid | Team leads are required to prepare monitoring reports | Open | Project Manager |
| 17 | Project Risk | the risks associated with the project, although documented, had no detailed action plans and were not categorized in terms of impact or severity. | Risk management are not well planned | Team members do not have solution to solve the problem when risks occur | 50% | 5 | -$15,000 | 25 | -$7,500 | Mitigate | Revise the risk register and implement risk response plan | Open | Project Manager |
| 18 | Technical Risk | the hardware and software delivery was still being negotiated with some potential vendors while there were only four (4) months to complete the project. | Bad negotiation skills from PROC manager | Unlicensed product | 20% | 3 | -$5,000 | 6 | -$1,000 | Transfer | Conduct negotiation with the hardware and software vendors | Open | PROC Manager |

**Conclusion**

Risk management is essential for the project team during a project. Proper risk management can lead to success of a project. Risk management should be done properly and well planned to increase the success rate of a project. Risk management requires sources from every department including the stakeholders of the system.