فرآیند جامع مدیریت ریسک در پروژه

به همراه آموزش نرم افزار

Risk Analysis

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Risk Monitoring and Control

Assigning Responsibility

- Several considerations arise in assigning **responsibility** for monitoring and controlling project risks in a stakeholder organization.
- The first point is that **different risks** may require **different monitoring procedures** and control measures at **different times** by **different people.**
- In any project stakeholder organization, it is **rare** for **one person** (or even one group of people) to bear **responsibility** for all the risk management activities of the organization.

Assigning Responsibility

- It is also important to note that at least **some** of the people **responsible** for **monitoring** and **controlling** risks are likely to be **different** to those involved earlier in **identifying** and **analyzing** those risks, and/or those involved in **deciding** upon risk treatments and **response** options.

Assigning Responsibility

- **Assigning responsibility** may also be influenced by the organization's **overall approach** to risk management.

relevant questions here include:

- Are there separate risk management systems for each project and another for the organization as a whole, or does an organization-wide system embrace all project work?
- Has a separate **safety management system** been implemented in the organization?
- Are other dedicated systems in place (e.g. for quality assurance or environmental management)?

project risk management systems (PRMSs)

- Many organizations have been **forced** into **formal** and **systematic** risk management by the prescriptive requirements of occupational health and safety legislation.
- In the United Kingdom, the Construction (Design and Management) regulations (CDM; HSE 2015) have extended this reach beyond construction contractors and into the professional disciplines involved in the construction industry.
- Similar legislation has been enacted in Australia (Lingard et al. 2014; Safe Work Australia 2016).

Project risk management systems (PRMSs)

- Other countries have taken similar approaches.
- Through developments such as these, all aimed at **improving health** and **safety** risk management beyond the purview of projects, many organizations have also implemented risk management systems designed to embrace other types of risks.

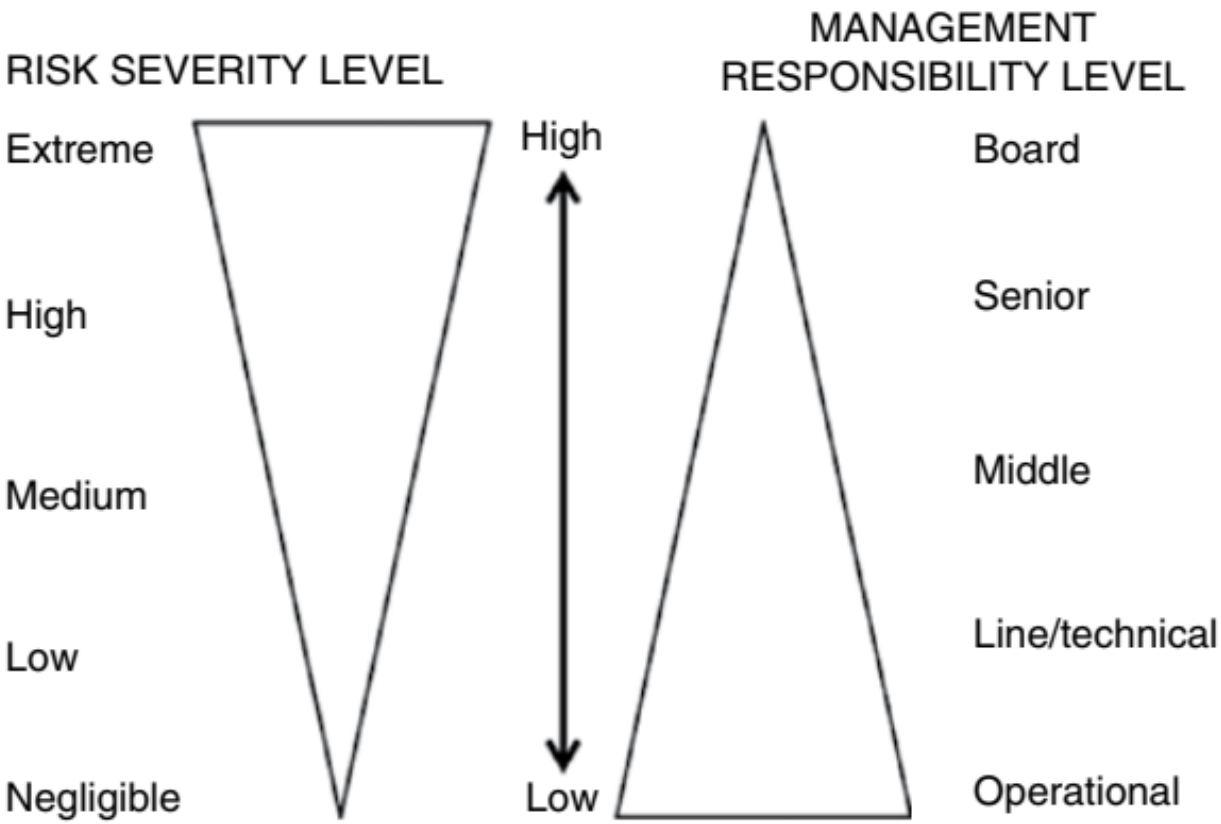
Project risk management systems (PRMSs)

- The topics to be considered include establishing the risk management requirements of the organization, **planning** and **designing** a PRMS, **organizational maturity**, building the system, **practicing** risk management, **operating** the system, PRMS **benchmarking** and **improvement**, and **dealing** with system decay.

Assigning Responsibility

- Fourthly, however project risk management **responsibility** is **assigned**, a representative of **senior management** at the **highest** level (e.g. a board member such as a vice president or projects director) should be **appointed** to **provide** global oversight of all project risk management, particularly during the **monitoring** and **control** process.

Assigning Responsibility



The risk severity–management responsibility relationship

Monitoring Procedures

- The nature and frequency of project risk monitoring required will be influenced by the type of project and the individual characteristics of each risk.
- Monitoring intensity, in terms of both nature and frequency, should increase commensurately with risk severity.
- monitoring frequency will also be influenced by the dynamics of the project.

Monitoring Procedures

- As a general principle, we would advocate monthly risk monitoring meetings for projects where the post-design implementation stage is longer than 12 months, particularly where the risk-related matters can be combined with, or follow, monthly progress meetings.

Monitoring Procedures

- For projects of shorter duration, fortnightly meetings may be more appropriate; while in some types of project, or periods where project activities are particularly risk-intense, weekly or even daily meetings may be needed.

Negligible Risks

- For negligible risks, minimum resources and staffing levels should be needed.
- It is likely that monitoring procedures for these risks can be combined with other project management activities or the work activities of line and operational staff.

Negligible Risks

- Reporting outcomes will probably be by exception, that is, only where observation indicates circumstances or situations happening (or likely to happen) beyond what could reasonably be expected to occur normally for such risks.
- Few data may be generated, and communication will be kept to a minimum.

Low Risks

- At low levels of risk, monitoring and control activity will increase slightly in intensity compared with that adopted for negligible risks.
- Monitoring frequency might increase, but is still likely to be combined with other routine tasks, again with the objective of flagging deviations from the norm. Communication will be on a more formal basis, with performance data relating to each risk included on a systematic basis.

Medium Risks

- With medium-level project risks, monitoring procedures should take on a more distinctive and systematic character.
- Ideally, the frequency of monitoring will be clearly established for all the affected areas of the organization, and will be formally incorporated into procedural policies and manuals.

Medium Risks

- As part of their job descriptions, staff involved will spend at least some of their time directly in risk monitoring and control activity.
- Formal and specific data recording and reporting procedures will be implemented, using planned communication channels. Higher levels of management oversight are needed on a planned and frequent basis.

High Risks

- High-severity threat risks generally require the appointment of dedicated and trained staff to undertake monitoring and control activity on a frequent, if not continuous, basis. Monitoring procedures must be consistent, repeatable, and easily auditable.

High Risks

- Significant senior management oversight is necessary on a frequency close to being continuous. Reporting should be at least to strictly defined minimum standards, and fast communication channels should be made available, with additional alternatives.

High Risks

- Complex data may be generated (some automatically), and sophisticated data analysis techniques (with appropriate database access) may be required.

Extreme Risks

- With risks of extreme severity, the highest state of preparedness should exist in the organization.
- Monitoring activity should be consistent and may have to be **continuous**.
- **Senior management** must be **directly** and **continuously informed** and **involved**.
- Reliable **high-level monitoring** data collection and **analysis** procedures will be implemented in conjunction with secure database access.

Control Measures

Control Measures

For **mitigated risks** (i.e. those where risk reduction, avoidance, or transfer actions have been implemented as part of the risk response treatment plans), it is important to check the **efficacy** of those measures in **real time**.

- Are the measures actually in place?
- Are they functioning **correctly** and **sufficiently**?
- Does more need to be done? These questions can be posed for any level of risk severity.
- They are particularly important for risk responses that originally included **transfer** or **avoidance**, since the effectiveness of these treatments may be **more difficult** to detect.

Control Measures-Negligible Risk

- Measures to control **negligible** risks can usually be left to ad hoc actions by appropriate operational and line management staff.
- Depending upon the **nature** of the risks, however, basic and refresher **training** should be premeditated and implemented beforehand.

Control Measures-Medium Risks

- **Medium-severity** threat risks require **control** measures that are almost entirely **pre-planned**.
- A ‘chain of responsibility’ approach should be adopted, ending with **senior management** at the **higher** end.

Control Measures-High Risks

- For **high-level** risks, appropriate **emergency response** and **recovery plans** and **procedures** should be in place and rehearsed, especially for risks with **serious consequences** for **human health** and **safety**.
- The escalating levels of responsibility for controlling such risks must be known and clearly understood across the project stakeholder organization, and should reach the executive board or partner level.

Control Measures-Extreme Risks

- **Control** measures for **extreme risks** may involve people throughout the whole **stakeholder organization** and beyond.
- **Emergency response** and **recovery plans** and **procedures** should be **pre-planned**, agreed through consultation with **external agencies**, **formalized**, **rehearsed**, **practiced** on a randomly arranged and informed basis, and stress-tested.
- Backup personnel and other resources should be readily available.
- Adequate public relations measures should be in place and tested.

Reporting Processes

Reporting Processes

- The way in which the **evidence** and **decisions** of risk monitoring and control are **reported** and **recorded** will depend upon the **nature** of the **risks** and the risk **consequences**.
- We do so only because the means should be **predetermined** and not allowed to become a **reactive post–risk** event measure.
- Reporting processes may be **automatic**, **semi-automatic**, or **manual**.
- They may be **continuous**, **intermittent**, or **periodic**.
- Reporting media may be **verbal**, **written**, or **audiovisual**.

Reporting Processes

- **Verbal risk reporting** may be the most **direct** and **realistic method** of reporting risks, but it is also the least **reliable** and the least **consistent**.
- Given the many barriers to effective verbal communication, it should always be **followed** up as soon as possible by more **formal** reporting methods.

Reporting Processes

- **Written reports** of risk monitoring and control activity can be either **formal** or **informal**.
- The latter might comprise abbreviated **handwritten** notes of observations and discussions and should be augmented soon after with more formal records.
- These might include **minutes of meetings**, **project logs**, and **updated project risk** item records, followed by updated versions of the project risk register itself.

Reporting Processes

- **Audiovisual reporting** is a useful adjunct to verbal and written reports, and it provides a reliable means of transmitting project risk information to project participants who may be physically located far from the central hub of project activities.
- In most instances, audiovisual reports will have to be **augmented**, or at least backed up, by written reports.

Capturing Project Risk Knowledge

- Ignored even more often than the systematic monitoring and control of risks, the **capturing** of project risk knowledge is **important** for a stakeholder organization in terms of being able to learn from its risk experiences.
- If an organization **lacks** any **formal** means of collecting information, processing it, and placing it into the organizational memory (the organizational risk register), experiential risk knowledge is simply left to reside in the individual **memories** of people in the organization.

Capturing Project Risk Knowledge

- A good PRMS, therefore, will include the means to capture the risk '**stories**' of the people involved in the project.
- Since the staff from the stakeholder organization are also likely to have had **interactions** with personnel from other stakeholders during the progress of the project, valuable **risk learning** from other perspectives may be acquired.

Reporting Processes

- Risks that are not **monitored** and **controlled** during the project implementation stage simply become risks that are not managed proactively but will have to be dealt with on a reactive basis should any **eventuate**.

Reporting Processes

- Important aspects that should be considered and arranged beforehand by the project stakeholder organization include: **assignment of responsibility**, **monitoring frequency** and **processes**, and **control** measures.
- As a general principle, each should be matched to the ascending order of threat **risk severity**.
- Modern **computer** and communications technology has substantially increased the means and quality of these processes for projects of all types.

Reporting Processes

- Risk reporting also requires **careful consideration** in terms of **method**, **content**, and **status**.
- It is likely that **new risks** will emerge during risk monitoring and control, and the circumstances of previously identified project risks may have changed.
- These will require **further analysis**, **evaluation**, and **response decisions**.

Schedule Risk Analysis

Schedule Risk Analysis

- Collecting anonymous and unbiased risk data
- Conducting risk data schedule
- Sensitivity analysis
- Probabilistic branching
- Schedule contingency
- Updating and documenting schedule risk analysis

Data Collection

- A schedule risk analysis requires the collection of program risk data.
- Risk data should be derived from a quantitative risk assessment and should not be based on arbitrary percentages or factors
- A risk assessment is a part of the program's overall risk management process.
- As risk are identified, risk handling plans are developed and incorporated into the program's cost estimate and schedule, as necessary.

Data Collection

- Risk data can be collected in the form of:

1. Three-point duration

- The three-point estimates inherent uncertainty, estimating error, and perhaps estimating bias.

2. Using the risk driver approach

-Risk driver represent

1. Identified risk event with probabilities
2. Likely effect if they occur

Data Collection

- Regardless of which type of risk analysis is performed, it is essential that subject matter expert (SME) be interviewed who are directly responsible for or involved in the workflow activities.
- There are a multitude of distribution curves available for programs to use during schedule risk analysis or assessment (SRA)

Important notes before simulation

- Hard Constraints – remove hard constraint from the IMS prior to running an SRA. Hard constraint impact the forward and backward pass.
- Level of Effort (LOE) : an LOE task should never drive discrete work. It should be excluded from the SRA.
- Planning Package: for SRA purposes treat planning package the same as every other discrete task by ensuring they are logically linked in the network.

Important notes before simulation

- Note: When modeling 3 point estimates on milestones ensure that the succeeding relationships are all FS

Three-point duration estimate-Step1

- One way to capture schedule activity duration uncertainty is to collect various estimates from individuals and a review of actual program performance.
- These would be develop from in-depth interviews of persons who are knowledgeable in each of the WBS areas of the program.

Estimated duration sample

Task	Opt	Likely	Pess	PERT
A	12	27	47	27.83
B	45	60	92	62.83
C	39	44	48	43.83
D	29	37	42	36.50

Three-point duration estimate – Step 2

- To model the risks in the simulation, the 3-point estimates represent all the risk in the project.
- A statistical simulation (typically a Monte Carlo simulation) use random numbers to select specific duration from each activity probability distribution and a new critical path and dates are calculated, including major milestone and program completion dates.

Three-point duration estimate – Step 3

- The Monte Carlo simulation continues this random selection thousand of times, creating a

1. New program duration estimate
2. Critical path each time

- The resulting frequency distribution displays

1. Range of program completion
2. Probabilities that activities will occur on these dates

Schedule Risk Analysis