I dedicate this booklet to all Risk Management Gurus & Project Managers who takes risk management a serious stream in managing their projects
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Why is it important to know terminologies?

Terminologies in any subject area are like vowels for a language. Knowing them is vital in effectively communicating with subject matter experts. Also, using appropriate terminology shows your proficiency in that domain.

Risk management is a unique knowledge area in project management that needs more attention & communication throughout the project life cycle. More stakeholders involved in bringing risks on project manager’s table. Unless all of stakeholders are in the same page while communicating among them about risk, it would result adverse effect which eventually affect project success. Making them familiar with commonly used words – terminologies give greater advantage of better risk management. I presented 15 terminologies as part of this booklet.
Project Risk

Talking about Risk is really challenging. Because risk always sounds negative and we feel it needs to be avoided by any means. Risk is a part of everyone’s everyday life. Here is a real story:

I was on the other side of the road. ‘Walk signal’ was still on, but only 2 seconds to cross. My heart was beating fast. I was running across the zebra crossing – my eyes were moving rapidly between the signal light and the vehicles which were waiting to cross. I almost crossed three-quarter of the road and the signal changed to ‘Stop’. I increased my running speed as vehicles started moving and a life was at risk. Anytime accident could have happened, but I somehow managed to escape.

Leaving the real life experiences apart, as a project manager, we need to love Risks and consider them opportunities to gain more control over the project against probable uncertain events. Here is the definition of Project Risk:

Project risk is an uncertain event or condition that, if it occurs, has a positive or negative effect on at least one project objective. [1]

Uncertainty is the one which makes Risk management more interesting than any other in Projects. Identifying, analyzing, monitoring and responding project risks are really a challenging.
* Risk Management Processes*

Managing risks in project is imperative for its success. We need to have a process (or processes) in place for risk management to be effective. Here are the five steps project manager can use for risk management:

**1. Identify Risks** – Identify risks that affect the project (positively or negatively) and documenting their characteristics

**2. Assess & Analyze Risks** - Assess the risk impact, Analyze the probability of risk occurrence and prioritize the risks, numerically analyze the effect of identified risks on project objectives (usually on cost, schedule and scope targets)

![Risk Management Process Diagram](image)

**3. Plan Actions** – Explore all the possible ways to reduce the impact of threats (or exploit opportunities). Plan actions to eliminate the risks (or enhance the opportunities). Action plans should be appropriate, cost effective and realistic.

**4. Monitor & Implement the Action** – Track the risks throughout the project. If risks occur then implement the risk strategy based on action plan. Ex. If mitigation strategy is selected, execute the contingency plan based on risk triggers. In case contingency plan fails, execute fallback plan.
5. Measure the effectiveness & Control the risk impact - Measure the effectiveness of the planned action and controlling the risk impact by understanding risk triggers & timely implementation of planned actions.

Risk management processes are cyclic which starts from identification of a risk and it may result in identification of another new risk. Usually, project managers have different opinions & ways to deal with risks. Some go for avoidance. Others go with risk taking. So, while working for a project, the approach to risk should be consistent to meet project objectives & this need to be documented in a risk management plan. Communication of risk and its approach to be done to risk team member/risk owners/stakeholders.
In our school days, we studied about probability of occurrence of an event like probability of getting 2 when rolling a dice once = 1/6. I hated probability in my college days as lot of derivations and assumptions need to be done. When I studied the same in Project Risk Management, I understood the real application. But it is not too late for me to brush up my school probability one more time.

Okay, let us dive into the topic right now.

**What are ‘known’ risks?**

*Known* risks are somewhat predictable & proactively managed. *Known* indicates those risk that can be identified, analyzed & planned in advance.

**What are ‘unknown’ risks?**

*Unknown risks are those unable to anticipate and describe. Unknown risks cannot be managed proactively. These risks that result from the uniqueness of the work and they are difficult or impossible to anticipate.*
For any project, before starting risk management planning process, ‘Unknown’ risks would be high. But through proper Risk Management Planning process, almost all risks can be explored which keeps ‘unknown’ risks to a minimal number.

In ideal situation, 0% ‘Unknown’ risk possible! (?)

Generally, the best method for managing unknown risk involves allocating reserves on the basis of the measured consequences of unanticipated problems on similar past projects.
* **Risk Category**

Let me start with the definition of the word ‘category’

*cat·e·go·ry*(noun): any general or comprehensive division; a class.

—Synonyms: group, grouping, type

The main goal of risk management is to avoid unpleasant surprises. This requires comprehensive list of identified risks. Risk categories are specific way to group risks under a common area which provides a structured & systematic approach in identifying risks to a consistent level of detail.

Some of the advantages using risk categories are:

* A good set of risk categories enable a greater management focus, thought provoking, and increasing the opportunity of identifying a wider range of risks

* As I told earlier, risk categories give structured approach to risk identification through which all risk areas are explored without fail

* Categorizing risks improve the effectiveness & quality of the risk identification & analysis processes

* Grouping risks by common root causes can lead to developing effective risk responses

* Risk categories also helps in risk assessment by interviewing or meetings with participants selected for their familiarity with a specific risk category

* Risk categories give greater ability monitor and control risks identified classified under the same area or root

It isn’t possible to develop one-size-fits-all risk categories for all projects/organizations. There could be common list of risk categories available which can be adapted with specific changes required for our projects. There are many ways to categorize risks. Generally, risks to the project can be categorized by

* sources of risk,

* the area of the project affected i.e. using Work Breakdown Structure(WBS), or

* other useful category like a project phase, to determine areas of the project most exposed to the effects of uncertainty.
Example for risk categories:

* Financial
* Security
* Legal & regulatory compliance
* Safety
* Stakeholder management
* Strategic
* Technology

As per PMBOK® Guide, risk categories are part of organizational process assets. Every organization should have standard lists of risk categories and it can be retrieved from achievements of already executed project.

To identify risks, project managers start with risk categories. But the process of identifying risks can also lead to identification of new risk categories. The newly identified category added to risk category list.

Risk categories can also be represented in a structured way into a Risk Breakdown Structure (RBS). The RBS is a hierarchically organized depiction of the identified project risks arranged by risk category and subcategory that identifies the various areas and causes of potential risks [1].
* **SWOT Analysis**

Strength, Weakness, Opportunity and Threat (Shortly SWOT) analysis is an important technique in risk identification. Let me repeat the definition of Project Risk before getting into this topic.

*Project risk is an uncertain event or condition that, if it occurs, has a positive or negative effect on at least one project objective* [1]

So, uncertainty is the one which makes risk management more interesting than any other thing in projects. Identifying, analyzing, monitoring and responding Project risks is really a challenging. Risk identification should include finding both positive and negative factors affecting the project.

**What is SWOT Analysis?**

* SWOT analysis is mainly used as **strategic planning tool** for business venture or project

* SWOT analysis is usually performed using **brainstorming**

* SWOT analysis **should be performed with definite goal** or end result or objective. Otherwise it is not useful

* SWOT analysis is more **subjective** and verification is tedious.

* In SWOT analysis, as **Strengths & Opportunities** are positive factors, **Weaknesses & Threats** form negative factors

* SWOT analyzes following two factors:

  * **Internal factors** – The strengths and weaknesses internal to the organization

  * **External factors** – The opportunities and threats presented by the external environment

  * Simple explanation for Strengths, Weaknesses, Opportunities & Threats are:

  * **Strengths**: internal organization factors those are helpful to achieving the project objective

  * **Weaknesses**: internal organization factors those are harmful to achieving the project objective

  * **Opportunities**: external conditions those are favorable to achieve the project objective

  * **Threats**: external conditions those are unfavorable to achieve the project objective
* In SWOT analysis, first internal factors (Strengths and Weaknesses) are identified then any opportunities for the project that arise from organizational strengths & threats arising from organizational weaknesses need to be identified

* SWOT analysis also examines the extent strengths can counterbalance threats and opportunities to overcome weakness

* More than this, SWOT Analysis can be used for individuals personal plan or for a small activity/event (like conducting a conference) too
**Risk Response Planning Strategies**

Risk response planning is a process that lists down various approaches for each risk identified. Generally approaches are chosen in order to reduce the impact of the negative risks or enhance the impact of the positive risks.

Risk Response for Negative Risks:

**Avoidance:** “I want to eradicate the risk by eliminating its cause” strategy. In this either the risk eliminated by different means or by changing the project plan. Hence probability of risk becomes zero which will improve safety to project success. This is the best possible strategy. But it is not possible to follow avoidance all the time. Example for avoidance: House construction during summer instead of rainy season.

**Transference:** “In case of risk occurrence, third party will bear the impact” strategy. This one is next to avoidance in terms of project safety (esp. financial risks). Here risk is not eliminated but the risk impact is transferred to another one with extra project budget cost. Example: Annual Maintenance Contract, Shop Fire Insurance, Theft Insurance, Natural Disaster Insurance.

**Mitigation:** “Reduce the probability & impact of risk to accepted level by good planning beforehand” strategy. Mitigation is taking calculated risk. We know there could be a risk. We cannot avoid it. But we know we can reduce the probability & impact by taking some measures at the start of the project. Hence we added few activities for that in execution phase.
Acceptance: “In case of risk occurrence, nothing to do” strategy. This is the Worst ever strategy & most of the risk books do not call this as strategy at all! All unidentified risks fall under this response category.

Risk Response for Positive Risks:

Exploitation: “I want to take advantage of an opportunity” strategy. We know there is a sure thing happens with this risk. Plan all actions to get more results of that. In this way we are increasing the impact. Example: adding talented resources to reduce project time.

Sharing: “Having partnership in utilizing maximum advantage” strategy. In this ownership of the risk lies with another party who can tap the opportunity for our benefit. Good example on this is outsourcing to specialized groups.

Enhancing: “Getting it done by doing the right things” strategy. Identify few enhancers or drivers for the event, perform that in such a way it increases the probability and/or impact of it.

Acceptance: “In case of risk occurrence, nothing to do” strategy. Though this is a worst negative response strategy, it is a nice one for positive risks. No need to throw stones on the tree, fruit automatically falls on your lap in the windfall!
* Contingency Plan & Fallback Plan

Generally, risks are recognized as threats to project success. But risks are also used positively by organizations for efficient, effective project success. In Risk Management processes, Risk response planning process plays important role.

*Risk Response Planning is the process of developing various options, strategies and actions to enhance or exploit opportunities and to reduce or eliminate threats to project objectives.*

Different risk strategies are used to reduce (or enhance) the probability/impact of the identified or even unidentified/unknown risks. In certain situations, risk management team uses acceptance strategy for known risks as the option based on analysis. As a general rule, all unknown(residual) risks follows acceptance strategy as no information available about them & team will deal with those risks as they occur.

Acceptance strategy can be either passive or active. Passive acceptance requires no action except to document the strategy, leaving the project team to deal with the threats or opportunities as they occur. The active acceptance strategy is to establish a contingency plan, contingency reserve, including amounts of time, money, or resources to handle known or even sometimes potential unknown, threats or opportunities.

*Contingency plan describes various specific actions that will be taken if the opportunity or threat occurs. These actions are carried out at the time of risk occurrence. So, these options should be time bound. This is mainly created for active acceptance.*

*Fallback plan is important in Risk Response Planning. When the contingency plan for a risk is not fully effective, team should implement fallback plan.*
Residual Risk

Risk management is a cyclic process. But for a project, it cannot go on forever. Right? Project manager, his team & management has to find a stop point on further assessment & responses. Those risks that remain even after developing responses to the project’s primary (or original) risks are called as Residual Risks [1].

Impact of residual risks is usually actively accepted. The project team has to document & monitor these risks throughout the project as they may occur anytime. Contingency plans & fallback plans are created to handle the situation when these risks occur.

Residual Risks are termed sometime as ‘Known Unknowns’ i.e these are identified risks(‘known’) but their impact is ‘unknown’ and it is accepted.
**Secondary Risk**

*You came up with initial identification, analysis and responses of project risks. But you found one new risk arises because of implementing already planned response for a risk.*

What to do with the new risk?

The new risk is called as ‘Secondary risk’. Secondary risks should also follow the same process like qualified, quantified and responses planned for them like in original risk.

**Definition from PMBOK® Guide: Secondary risks that arise as a direct outcome of implementing a risk response [1].**

In some cases, secondary risks remain after responses. They all accepted for which the contingency plan & fallback plan need to be prepared.
**Risk Reserve**

We can divide risks into following three broad categories based on their identification & response planning:

1. **Known – Responded (with avoidance, mitigation, transference)**

2. **Known – Not responded (or accepted)**

3. **Unknown (here also default strategy is acceptance)**

Eliminating maximum number of risks is the main objective. But not all can be eliminated or responses would be too costly or time consuming and hence the risks are accepted.

In case of transference – project cost need to include the insurance amount.

In case of mitigation – project cost and schedule need to consider the extra effort to execute contingency plan and subsequent fallback plan in case of contingency failure.

So even implementing planned responses increases cost and schedule of the project to execute the activities. These are not extra. They are inherent to the project based on the risk responses and it should not be omitted during planning phase. These added cost and schedule due to risks are called ‘Reserve’.

There are two types of reserves.

**Contingency reserve** is needed to tackle residual risks or “Known – Unknowns”. Risks that are identified but they are accepted.

**Management reserve** handles the “Unknown” risks. Those risks that are not identified as part of risk management process are “Unknown” risks. We don’t know what the risk is and we don’t have any response plan for them. They fall under ‘accepted’ risks.

Project manager has to take these into consideration in project schedule & budget plans. General representation of the project total budget & total schedule [2] is:

\[
\text{Project’s Total Budget} = \text{Sum of (Project’s Activity Cost)} + \text{Contingency Reserve} + \text{Management Reserve}
\]

\[
\text{Project’s Total Schedule} = \text{Critical path duration} + \text{Contingency Reserve} + \text{Management Reserve}
\]
* Risk Triggers

“Don’t go outside. It may rain heavily today” Mom warned me when I was planning to go to play ground.

“How do you know Mom?” I asked her.

Raising her hand & pointing the sky she told “See those black clouds moving very fast towards our side. That is the sign”.

An experienced person will interpret signals or symptoms of an event occurrence beforehand. In risk management, with triggers, the indicator of risk event through which we can anticipate & handle risk effectively.

In projects, triggers are generally documented as soon as a risk is identified. But in many cases it is not possible to come up with risk trigger immediately with risk identification. So, triggers are reviewed & get updated throughout the risk management process. All triggers, either big or small need to be documented for effective risk response. In risk monitoring, risk owners takes responsibility of watching out for risk triggers & execute different plans as per the risk response plan.
**Risk Register**

Risk register (also called as Risk Log) is a master document for all risk related processes. Though it is created during risk identification but updated throughout the project management life cycle. It is part of project management plan.

It contains complete information about project risks like

- Risk description,
- Risk owner,
- Risk Category,
- Cause of the Risk,
- Effect or Impact of the Risk,
- Project phase detected & affected,
- Ranking,
- Affected WBS activity,
- Probability of occurrence,
- Frequency of occurrence,
- Proposed responses,
- Approved final response,
- Contingency plan,
- Fallback plan,
- Risk Triggers,
- Last occurrence,
- Cost of mitigation/fallback plans,
- Time required for risk responses,
- Reserves,
- Risk review audit information and Current status of the risk.
- It also contains information about residual risks & secondary risks.
**Risk Breakdown Structure**

Risk Breakdown Structure (RBS) is defined as “A source-oriented grouping of project risks that organizes and defines the total risk exposure of the project. Each descending level represents an increasingly detailed definition of sources of risk to the project.” - David Hillson[3]

Instead of going through big spreadsheet with hundreds of verbose entries about risks, RBS provides - a pictorial representation of related items through tree structure as an excellent way of getting the whole picture in a single place for effective communication, management and governance.

Organizations have common list of risk categories or even template with sample risks for each category and type of project. This can be used as starting point for risk identification. All advantages listed for risk category above suits for RBS also.
Risk probability and impact matrix

This is one of the Qualitative Risk Analysis tool. Probability of risk event occurrence & its impact is the main measure of a risk. A risk is analyzed based on probability of its occurrence and impact on project objectives to arrive its score. All identified risks are tabulated based on P x I scale format to get a high, medium or low priority risk list.

Project manager can analyze impact based on specific objectives like cost, schedule, quality, etc. This will be very much useful to identify broader project area of concentration. Generally organizations that already practicing P x I matrix, has commonly published scale ratings and their meanings for uniformity of analysis for all its projects.
**Preventive Actions**

*Prevention is better than cure - proverb*

Though Preventive Action term is often used with Quality Management Systems, but it is vital and used widely in all knowledge areas esp. Project Integration, HR, Quality & Risk.

Some processes recommend preventive actions as output and few other processes takes the approved preventive actions as input to bring the project into compliance with project management plans.

*Preventive Actions are documented direction to perform an activity that can reduce the probability of negative consequences associated with project risks.* [1]

Preventive actions are recommended in anticipation of possible problems and they are generally output from monitoring and controlling process group. Preventive actions may also include contingent actions taken to reduce the seriousness of a future problem if it should occur. Depends on the nature of responses to preventive actions, sometimes, they may results in a change request.

*A simple example of Preventive action would be providing first aid kits in each block of organization and posting list of emergency phone numbers inside lifts.*

Project manager and project management team along with all stakeholders need to review recommended preventive actions and debate on the effectiveness and implementation procedures before they are submitted for approval. Only approved preventive actions are later implemented.

Preventive action is a proactive process to identify opportunities for improvement rather than a simple reaction to identified problems. Preventive action include investigation, action, review, and further action if so required and follow Deming’s PDCA cycle.

In Quality management, Recommendation of new preventive actions is done in Quality control process. Preventive action involves action taken to prevent a condition that may exceed established parameters in a manufacturing or development process, which may have been indicated through a QC measurement.

In Quality Assurance process, quality audits confirm the implementation of approved change request, defect repairs, corrective actions, and preventive actions and it may recommend corrective actions.
Taking preventive actions in HR issues reduces the probability and impact of resource problems before they occur. *Examples to preventive actions are: training resources beforehand to reduce problems during resource crunch, clarification on roles and responsibilities, project progress and deadlines can increase the team buy-in and reduce problems when they are asked to put extra effort to meet project deadlines.*

By anticipating stakeholders’ reaction to the project, taking preventive actions can be taken to win their support or minimize potential negative impacts.

Root cause analysis combined with corrective action to help understand the cause of the deviation and potentially prevent recurrence of a similar problem.
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