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PMAC Consulting Private Limited

presents

"EFFECTIVE RISK MANAGEMENT"

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Project Risk Management

*Project Risk Management includes the processes concerned with conducting risk management planning, identification, analysis, responses, and monitoring and control on a project.

* This definition is taken from the Glossary of the Project Management Institute, *A Guide to the Project Management Body of Knowledge,* (*PMBOK® Guide)–Fourth Edition,* Project Management Institute, Inc., 2008.

Project Risk Management

Processes:

1. Plan Risk Management
2. Identify Risks
3. Perform Qualitative Risk Analysis
4. Perform Quantitative Risk Analysis
5. Plan Risk Responses
6. Monitor and Control Risk

Planning Process Group

Monitoring and Controlling Process Group

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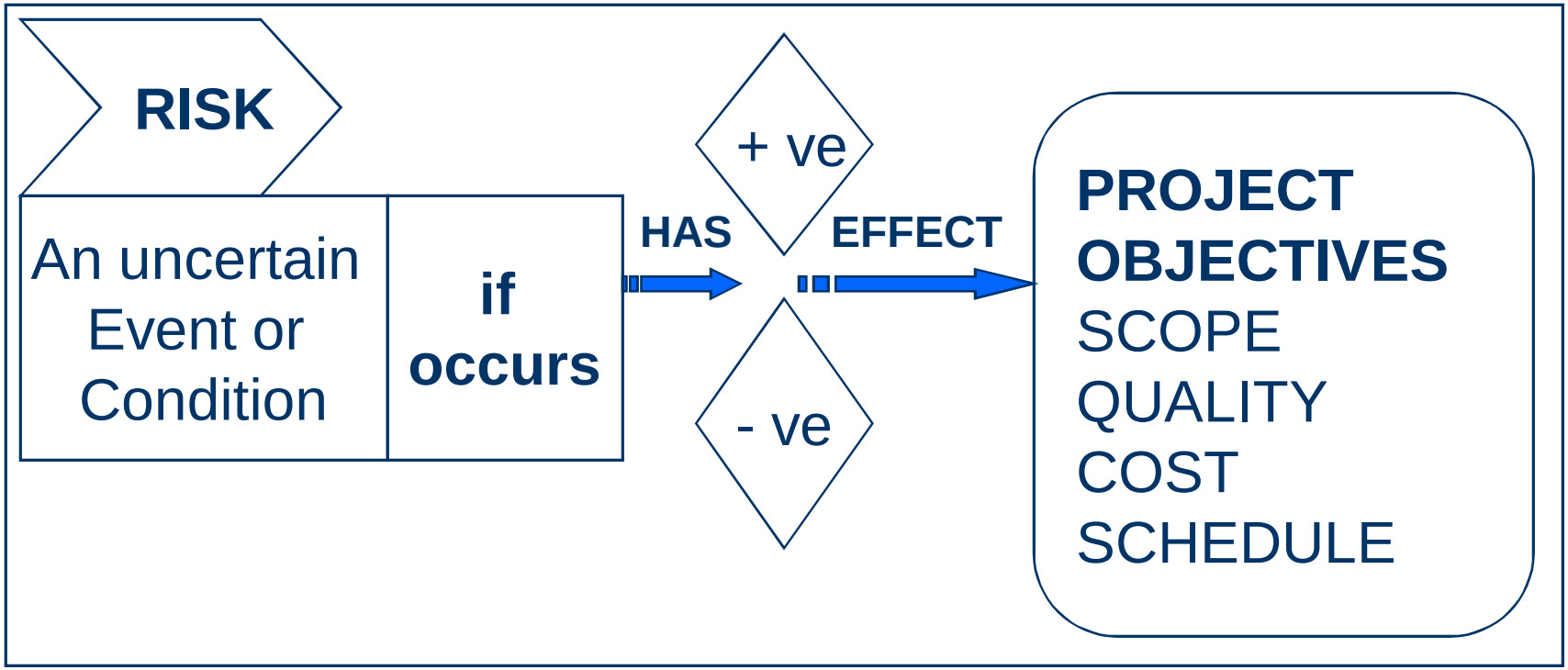
Project Risk Management

Project Risks?



Project Risk Management

THE CONCEPT

Project risk has its origin in the UNCERTAINTY that is present in ALL projects!

❖ risks could be positive (opportunities):

-an equipment is cheaper than planned, a work package is accomplished earlier than expected, achieving quality level on a work package takes lesser time than expected, work can be done faster as we were able to acquire a more productive resource!

Project Risk Management

THE CONCEPT

Project risk has its origin in the UNCERTAINTY that is present in ALL projects!

- risks could be negative (threats)
- risks could be known
- risks could be unknown

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Project Risk Management

What is cost contingency in following analysis of a product modification project?

- **30% probability of delay in components receipt with a cost to the project of Rs.9,000/-**
- **20% probability that components will be Rs.10,000 cheaper than expected.**
- **25% probability that two parts will pose installation issue costing extra Rs.3,500/-**
- **30% probability that production will be simpler than expected, saving Rs.2,500/-**
- **5% probability of a design-defect causing Rs.5,000 rework**

Project Risk Management

What is cost contingency in following analysis of a product modification project?

- **30% X Rs.9,000 = Rs.2,700 outflow, add**
- **20% X Rs.10,000 = Rs.2,000 saving, subtract**
- **25% X Rs.3,500 = Rs.875 outflow, add**
- **30% X Rs.2,500 = Rs. 750 saving, subtract**
- **5% X Rs.5,000 = Rs.250 outflow, add**

OUTFLOW TOTAL Rs.3825, SAVING TOTAL Rs.2750

Contingency amount = 3825 – 2750 = Rs.1075

Project Risk Management

THE CONCEPT

- Risk is a function of the UNIQUENESS of a project and the EXPERIENCE of the project team.
- When activities are routine, you can anticipate the range of potential outcomes.

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Project Risk Management

THE CONCEPT

- When project activities are non-routine (not performed before and your team is inexperienced), the potential outcomes are more uncertain, making it difficult for you to know what may go wrong and how to avoid problems.
- Even in routine projects, the outcomes may be influenced by new factors, or those beyond your control.

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Project Risk Management

THE CONCEPT

- Persons (by extension organizations) have attitudes towards risks that affect both accuracy of the perception of the risk and the way they respond!!
- A consistent approach to risk that meets organization's requirements) must be developed for EACH PROJECT! And communication about risk must be made open and honest!

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Project Risk Management

THE CONCEPT

- Risk responses reflect an organization's perceived balance between risk-taking and risk avoidance!
- TO BE SUCCESSFUL, we must manage risks proactively and consistently throughout the project!

Now, the first process: Risk Management Planning →

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Project Risk Management

Why risk management planning?

CAREFUL AND EXPLICIT planning increases the possibility of SUCCESS of five other risk management processes!

- ✓ **Decide how to approach and conduct risk management activities on the project.**
- ✓ **Provide sufficient time and resources for risk management activities.**
- ✓ **Establish an agreed-upon basis for evaluating risks.**

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When risk management planning?

Should be completed EARLY during project planning because it is CRUCIAL to performing other risk management activities!

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Project Risk Management

*Plan Risk Management

*The process of defining how to conduct risk management activities for a project."

*This definition is taken from the Glossary of the Project Management Institute, *A Guide to the Project Management Body of Knowledge,* (*PMBOK® Guide)–Fourth Edition,* Project Management Institute, Inc., 2008.

Plan Risk Management Process

To master this process, we will now deliberate on the following three questions:

1. **What do we need?**
2. **How we perform it?**
3. **What do we achieve?**

Answering these questions will make us understand the process well.

Project Risk Management

Enterprise environmental factors

The attitudes toward risk and risk tolerance of the organizations and the people involved in the project will influence the project management plan. Risk attitudes and tolerances can be found in policy statements or in actions.

Project Risk Management

Organizational process assets

predefined approaches to risk management, such as:

1) Risk categories
2) Common definition of concepts and terms
3) Standard templates
4) Roles and responsibilities
5) Authority levels for decision-making

Project Risk Management

Project scope statement

- Provides a clear sense of the range of possibilities related to the project and its deliverables.
- Establishes the framework for how significant the risk management effort may ultimately become!

Cost management plan

- defines how risk budgets, contingencies, and management reserves will be informed and availed!

Project Risk Management

Schedule management plan

- defines how schedule contingencies will be informed and availed!

Communications management plan

- defines the interactions that will occur on the project
- Determines who will be available to share information on various risks and responses at different locations and times.

Project Risk Management

Discussion on tools & techniques

Planning meeting

Must ensure participation of:

1. **project manager,**
2. **project team leaders,**
3. **people responsible to manage risks and implement plans,**
4. **Key stakeholders,**
5. **SMEs and others as necessary**

Project Risk Management

Planning meeting

What do we do in the meetings:

1. Define basic plans for risk management activities.
2. Develop risk cost elements and schedule activities for including in project budget and schedule.
3. Assign risk responsibilities.
4. Tailor to the project: templates for risk categories and definitions of terms like ‘Levels of Risk’, ‘Probability by type of Risk’, ‘Impact by type of objectives’, plus probability and impact matrix.

Project Risk Management

Discussion on outputs

*Risk management plan. ***The document describing how project risk management will be structured and performed on the project. it is contained in or is a subsidiary plan of the project management plan. Information in the risk management plan varies by application area and project size. *The risk management is different from the risk register that contains the list of project risks, the results of analysis, and the risk responses*."**

*This definition is taken from the Glossary of the Project Management Institute, *A Guide to the Project Management Body of Knowledge,* (*PMBOK® Guide)–Fourth Edition,* Project Management Institute, Inc., 2008.

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Sample RBS
Categorizing risks

Project Risk Management

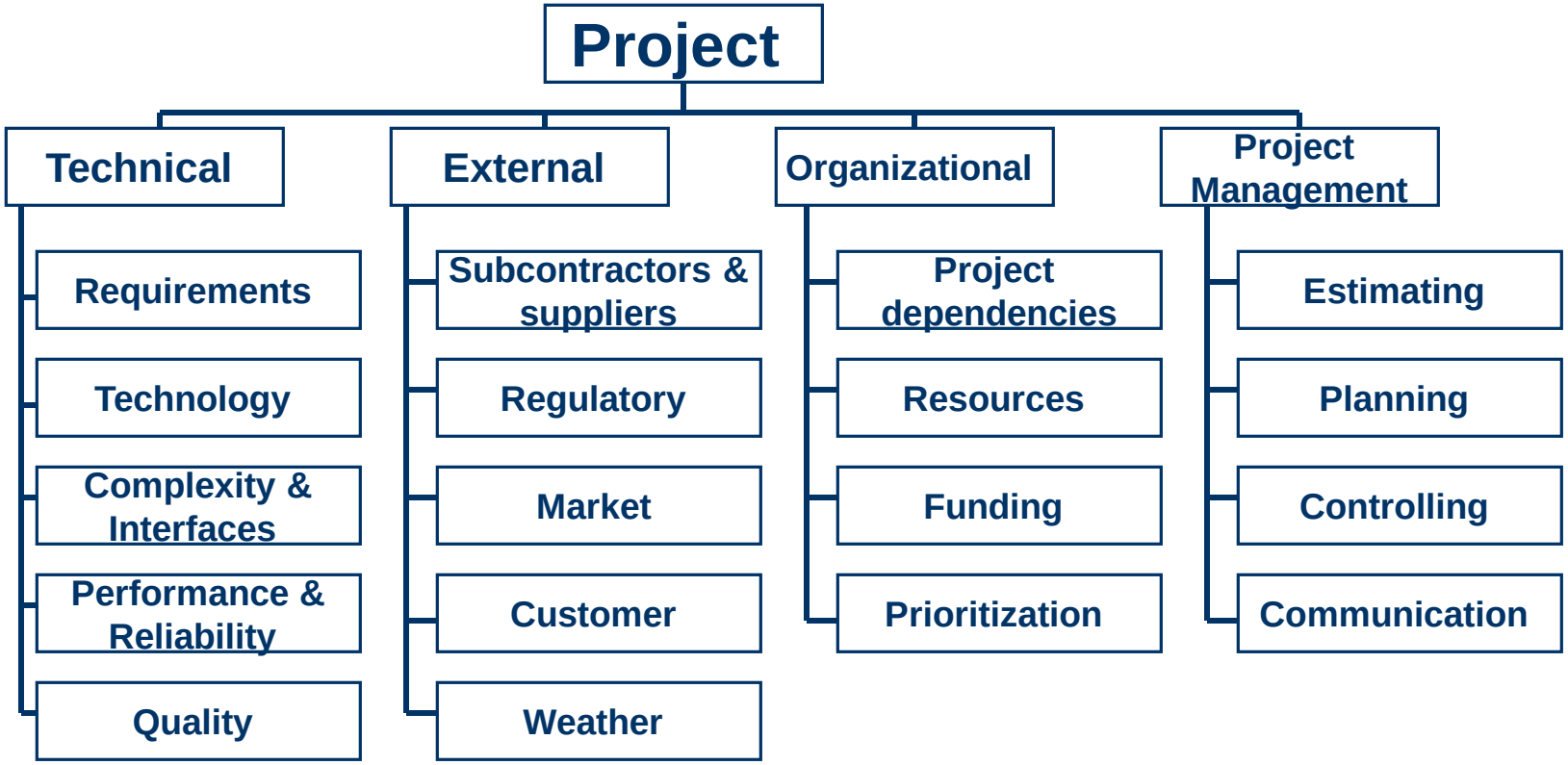

**Figure Source:* The Project Management Institute, *A Guide to the Project Management Body of Knowledge, PMBOK® Guide)–Fourth Edition,* Project Management Institute, Inc., 2008. Figure 11-4. Example of a Risk Breakdown Structure (RBS)

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Project Risk Management

DETERMINES which risks might affect project objectives! And document their characteristics.

Is it a one time job?

No, it's an iterative job as new risks may appear just as the project moves ahead in project life cycle!

Project Risk Management

Risk identification is not easy job.

- **I have seen many organizations taking it casually on their projects, only to pay heavily later (negative risk), or miss opportunity (positive risk) that they would have benefited from.**

Project Risk Management

IDENTIFIES which risks might affect the project

DOCUMENTS their characteristics

INVOLVES:

a) Reviewing every input variable, activity, key material and resource
b) Identifying threats and opportunities
c) Preparing checklists from others' experience and ensuring completeness

ADDRESSES:

1) Internal risks (risks within control / influence of project team, such as staff assignments, cost estimates, etc.)

2) External risks (risks beyond control / influence of the project team, such as market shifts or Government actions, etc.)

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Project Risk Management

SHOULD not be done by the project team alone.

MUST INCLUDE :

- ✓ your project team (for a sense of ownership/responsibility)
- ✓ risk management team (can you tell why?)
- ✓ subject matter experts (from other parts of your organization)
- ✓ other project managers (can you tell why?)
- ✓ outside experts
- ✓ customers
- ✓ end users (very important)
- ✓ other stakeholders

Project Risk Management

Risks can not be identified by just conducting the exercise once.

You have to *iterate* it to bring all risks to your grip.

Risk identification iterations:

1. First iteration- by a part of your project team.
2. Second iteration- by entire project team and primary stakeholders.
3. Final iteration- by people not involved in your project **(to remove the chances of any biased analysis).**

Project Risk Management

Please remember!

- ✓ Risks identification process normally leads to qualitative risk analysis.
- ✓ May also lead to quantitative risk analysis if done by an EXPERIENCED RISK MANAGER.
- ✓ Sometimes, simply conducting risk identification may suggest its response that is for further analysis and implementation in the risk response planning.

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Project Risk Management

***Identify Risks.** The process of determining which risk may affect the project and documenting their characteristics.

***Risk.** An uncertain event or condition that, if occurs, has a positive or negative effect on a project's objectives.

*These two definitions are taken from the Glossary of the Project Management Institute, *A Guide to the Project Management Body of Knowledge,* (*PMBOK® Guide)–Fourth Edition,* Project Management Institute, Inc., 2008.

Identify Risks Process

To master this process, we will now deliberate on the following three questions:

1. **What do we need?**
2. **How we perform it?**
3. **What do we achieve?**

Answering these questions will make us understand the process well.

Project Risk Management

Risk management plan

Provides all these used here

1) Assignment of roles and responsibilities for risk management activities.
2) Provision in budget and schedule
3) Categories of risks.

Project Risk Management

Risk management plan

Categories of risks

- **First category pertains to Technical / Quality / Performance Risks**

  Examples: dependence on new, or complex, or unproven technology, unrealistic performance objectives, etc.

Project Risk Management

Risk management plan

Categories of risks

- **Second category relates to Project Management Risks**

  Examples: inadequate application of project management disciplines, Poor quality of project plan, Insufficient allocation of resources and time, etc.

Project Risk Management

Risk management plan

Categories of risks

- **Third category pertains to Organizational Risks**

  Examples: internal inconsistency with scope, time, and cost objectives, poor project prioritization, funding problems, resource conflict due to multiple projects in the organization, etc.

Project Risk Management

Risk management plan

Categories of risks

- **Fourth category belongs to External Risks**

  Examples: labor unrests, shifting owner priorities, weather, legal/regulatory changes, country-related risk. FORCE MAJEURE RISKS : floods, earthquakes, civil riots, cyclones, etc.) do not call for risk management, but they need disaster recovery actions.

Project Risk Management

Risk identification needs an understanding of:

1) **The schedule,**
2) **Cost, and**
3) **Quality management plans**
4) **Outputs of other knowledge area processes for review to find possible risks across entire project.**

Project Risk Management

Outputs of other knowledge areas

most vital inputs **to risk identification as they allow us understand project's mission, scope, and objectives of the stakeholders (including customer, sponsor, etc.)**

These outputs are:

- ✓ **Project charter**
- ✓ **WBS**
- ✓ **Product description**
- ✓ **Schedule and cost estimates**
- ✓ **Resource plan**
- ✓ **Procurement plan**
- ✓ **Assumptions and constraints lists**

Project Risk Management

Stakeholder Register

Used in inviting inputs for identifying risks from key stakeholders (like customer).

Project documents

- assumptions log
- Work performance reports
- EV reports
- Network diagrams
- Baselines
- Other project information of use

Project Risk Management

Enterprise environmental factors

Provide for help in risk identification:

1) Commercial databases
2) Academic studies
3) Benchmarking
4) Other industry studies

Project Risk Management

Organization process assets

Provide information from previous project files, including actual data and lessons learned.
Can you figure out what help organizational process assets provide us here. Enough we have discussed about organizational process assets!

Project Risk Management

Risk identification **is a serious job, hence 5 tools and techniques come to Your Help comes from the following:**

1. Documentation reviews is the structured review of:

- Project plans
- Assumptions- project level
- Assumptions- detail scope levels
- Prior project files, and
- Any other information

Project Risk Management

2. Information-gathering techniques

The aim: to obtain a comprehensive list of risks that can be later addressed in risk assessment processes.

TECHNIQUES:

- **Brainstorming (frequently used)**
- **Delphi- to reach consensus of experts anonymously**
- **Interviewing: experienced project participants and subject matter experts**
- **Root cause identification (for effective response)**
- **SWOT analysis (project's strengths, weaknesses, opportunities, threats are analyzed to give a much wider view of the risks under consideration).**

Project Risk Management

2. Information-gathering techniques

- **Brainstorming (frequently used): project team performs with multidisciplinary set of experts. Ideas on project risk are gathered with the help of a facilitator. Categories of risk (like RBS) can be used as a framework. Risk are identified and categorized and their definitions refined.**

- **Delphi- to reach consensus of experts anonymously . A facilitator sends a questionnaire to gather ideas about important project risks, summarizes responses and sends them again. Consensus is reached in few rounds, but without experts knowing names of participants.**

  Advantage: helps reduce bias in data and keeps any one person from having undue influence on the outcome!

Project Risk Management

3. Checklist analysis

Most handy and generally liked by people for they are quick and simple.

Checklists are made, based on: Historical information, knowledge derived from experience on prior projects, and other sources.

ITEMIZE all categories of risks relevant to your project.

Project Risk Management

3. Checklists

But there is a caution!

It is not possible to make an exhaustive checklist containing all risks on your project. There may be some important risks on current project not listed in your standard checklist!

IMPROVIZE YOUR CHECKLIST DURING CLOSING PROCESS FOR USE ON NEXT PROJECTS! the risks that have happened a new should be incorporated! Updating risk checklist during closing is an important duty! Please don't forget it!

Project Risk Management

4. Assumptions analysis

Remember so many assumptions you have made while initiating the project, defining scope, planning resources, estimating time and cost, etc.?

What if they turn out to be

inaccurate, inconsistent, and incomplete later?

THEY BECOME RISKS!

Hence, you must analyze their validity to assess how far they will stand to be true.

Project Risk Management

5. Diagramming techniques

Help you immensely in identifying the risks.

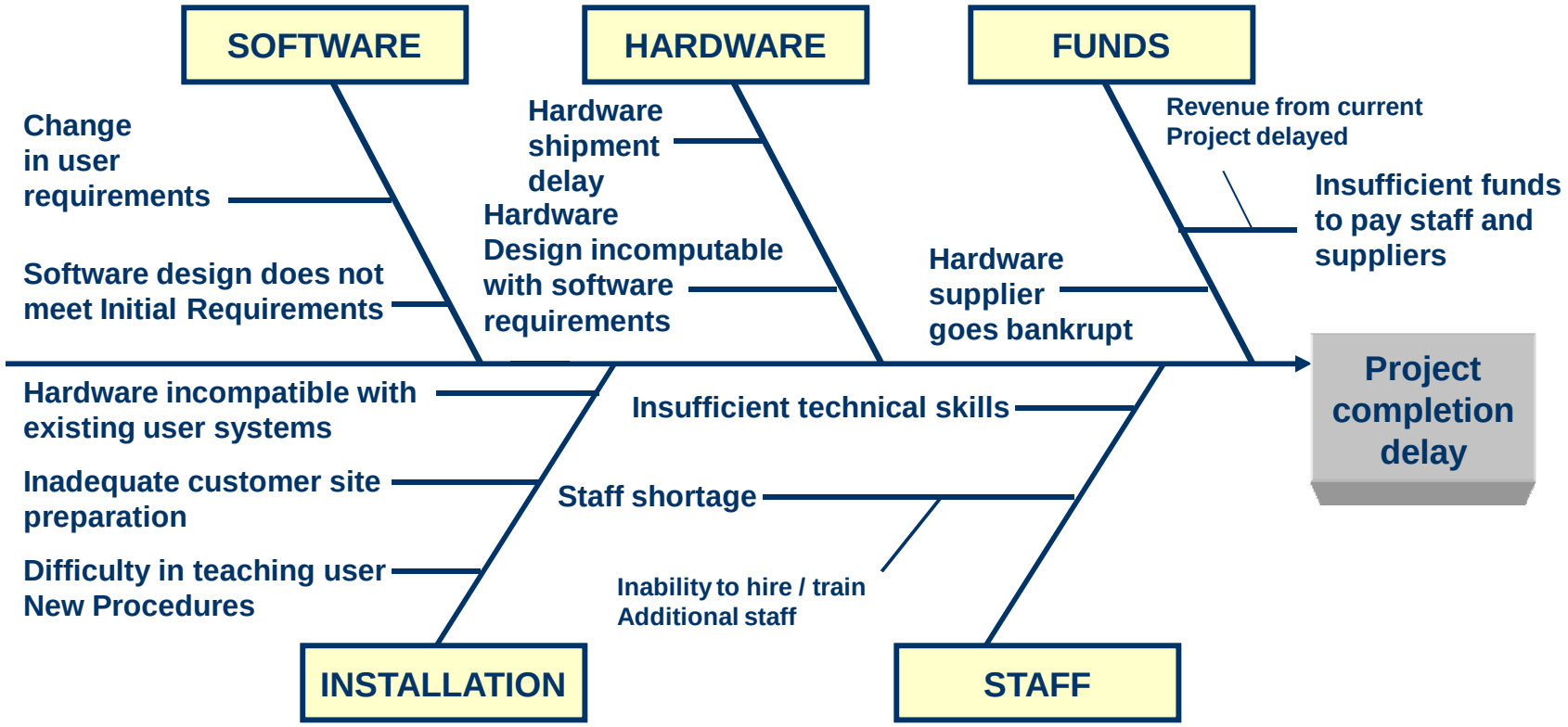
You can use:

- **Cause-and-effect diagrams (Ishikawa / fishbone diagrams)**
- **System / Process Flow Charts**
- **Influence Diagrams**

examples →

Project Risk Management

- **Cause-and-effect diagrams (Ishikawa / fishbone diagrams)**



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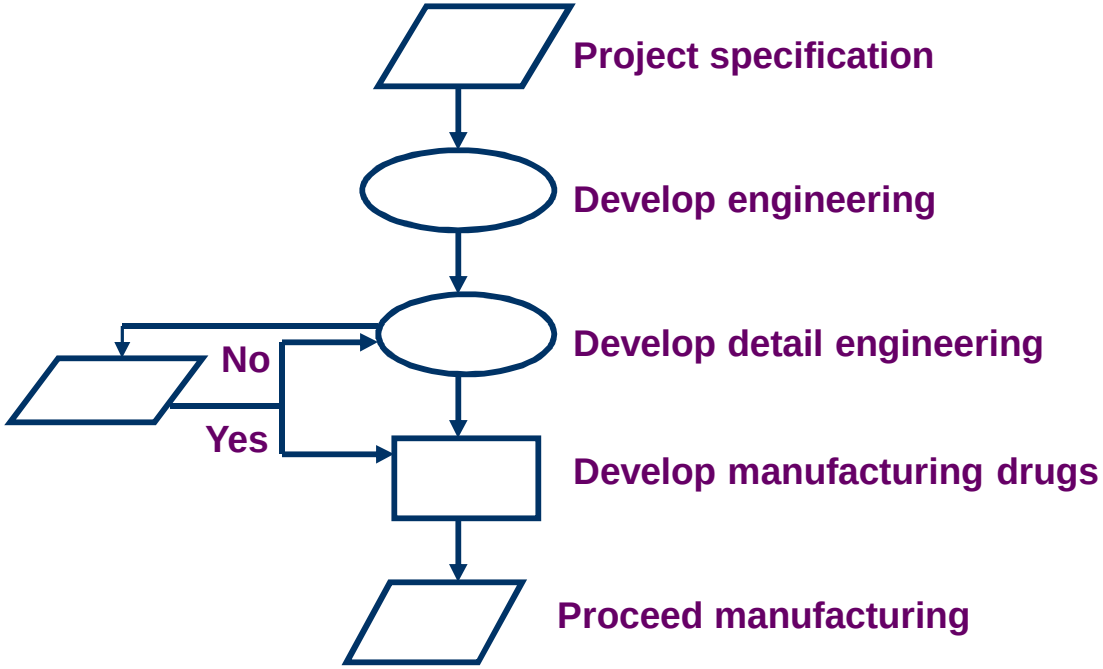
- System/ process flow charts

depict interrelationship of elements and mechanism of causation.



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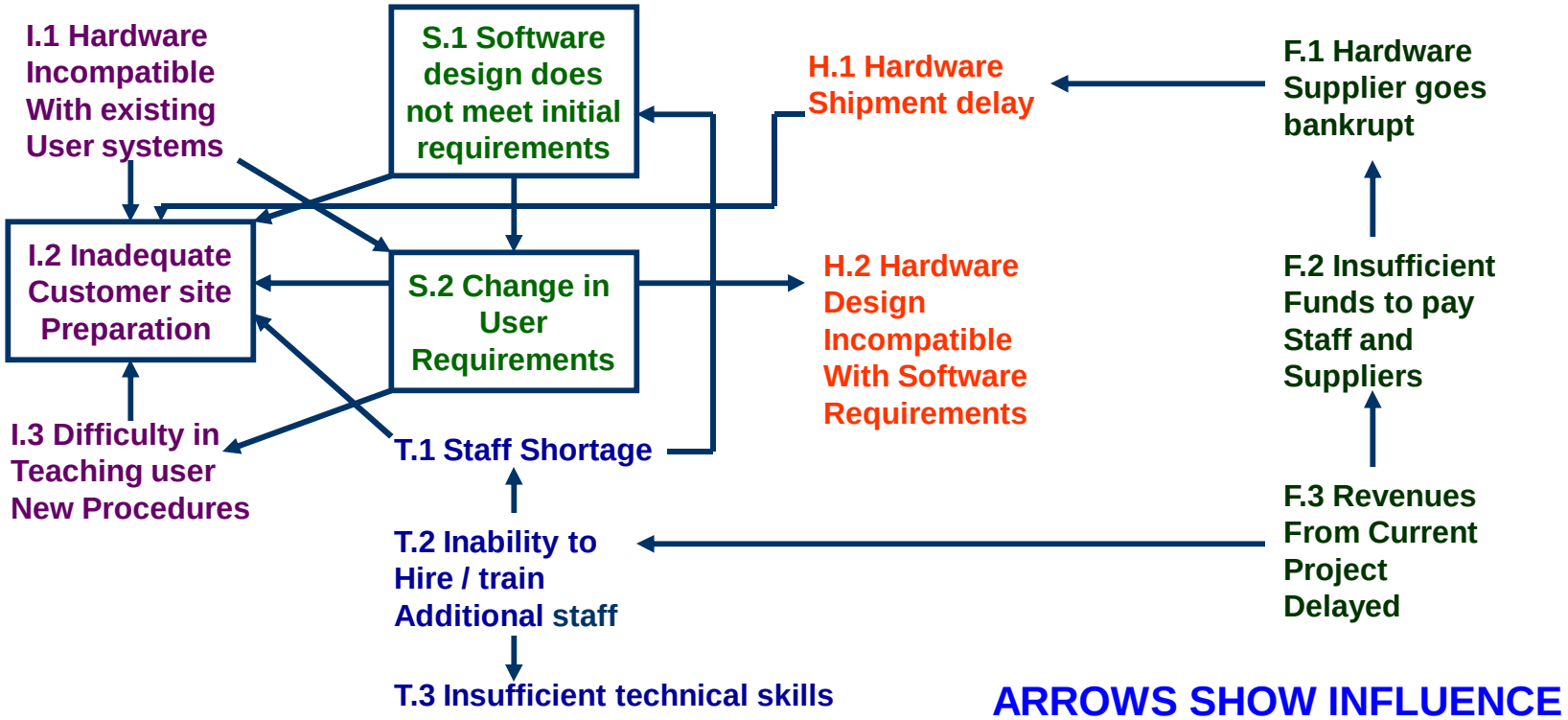
- **Influence diagrams- show a problem with casual influences, time ordering, and other linkages among variables and results.**



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Expert judgment

Experts with relevant experience help us identify risks.

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We have done great job!

Let's see the output we have got!

Risk Register

- **List of identified risks with their root causes.**
- **List of potential responses.**

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Please remember that the risk register is first developed in the Identify Risks process and then updated during rest of the risk management processes!

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Sample Risk Register

Output of Risk identification	Output of qualitative risk analysis	Output of quantitative risk analysis	Output of Risk response planning	Output of Risk monitoring and controlling	
✓List of identified Risks ✓List of potential Responses ✓Root causes of Risks					

Project Risk Management

- ✓ List of identified risks: identified risks with root causes under certain project assumptions. Examples:

1) A few large items with long lead times are on CP
2) IR problem at port may delay delivery and then delay completion of construction phase
3) Plan for a size of ten but only six resources available

- ✓ List of potential responses: identified during risk identification.
- ✓ Root causes of risk: fundamental conditions/events causing risk.
- ✓ Updated risk categories: new risk categories being added to the list of risk categories. RBS may be enhanced.

Project Risk Management

*Perform QUALITATIVE RISK ANALYSIS

*The process of prioritizing risks for further analysis or action by assessing combining their probability of occurrence and impact.

*This definition is taken from the Glossary of the Project Management Institute, *A Guide to the Project Management Body of Knowledge,* (*PMBOK® Guide)–Fourth Edition,* Project Management Institute, Inc., 2008.

Perform QUALITATIVE RISK ANALYSIS

Process of also assesses other factors

1) Timeframe
2) Risk tolerance of schedule, cost, scope, and quality

Project Risk Management

Some principles-A

1) Organizations can IMPROVE POJECT'S PERFORMANCE effectively by focusing on HIGH-PRIORITY RISKS.
2) A quick and cost-effective method of establishing priorities for: RISK RESPONSE PLANNING.

- Lays foundation for Quantitative Risk Analysis.
- MUST be revisited during project life cycle to remain current with the changes in the project risks.

Project Risk Management

Some principles-B

4) Definitions of the levels of probability and impact, and expert interviewing corrects the element of bias present in the data utilized in this process.

5) Time criticality of risk actions highlight the significance of A RISK

6) This process can lead to quantitative risk analysis or directly into risk response planning.

Project Risk Management

What do we intend to achieve?

- ✓ **Prioritize risks according to their potential effect on project objectives**
- ✓ **Sort out high or moderate risks for more analysis, their quantification, and management**
- ✓ **Find trends in qualitative risk analysis results to see urgency and significance for risk response and further analysis.**
- ✓ **Determine overall risk ranking of the project.**
- ✓ **Remove biases in the project plan**

Perform Qualitative Risk Analysis Process

To master this process, we will now deliberate on the following three questions:

1. **What do we need?**
2. **How we perform it?**
3. **What do we achieve?**

Answering these questions will make us understand the process well.

Project Risk Management

Organizational process assets provide data about risks on the past projects and lessons learned knowledge base for use here

Project Risk Management

Project scope statement

Common or recurring type

projects have well-understood

Risks. Projects using state-of-the-art, first-of-its-kind technology, or highly complex ones have more certainty.

We can know this from scope statement.

Project Risk Management

Risk management plan

Provides ***for this process***:

- roles & responsibilities
- Budgets and schedule activities
- Risk categories
- Definition of probability & impact
- P & I matrix
- Revised stakeholders' tolerances

Project Risk Management

Risk register

Provides ***for this process***:

- The KEY input LIST OF IDENTIFIED RISKS which need to be prioritized into Low, Medium, and High by combining their probability and impact as assessed during this process.
- The risk register also provides information on the characteristics and root causes of the identified risks.

Project Risk Management

Risk probability and impact

Describe probability and impact of a risk in

qualitative terms.

Risk probability

The likelihood that a risk will happen

Risk consequences

Its effect on project objectives, if it happens

- **Applied to specific risk events not entire project**
- **Helps identify risks that need to be managed more aggressively.**

Project Risk Management

Probability/impact rating matrix

Now, we build a matrix by combining probability and impact scales to know the risk in qualitative terms, such as very high, high, moderate, low, very low.

These scales improve quality of data and enable repeatability of process.

Project Risk Management

Probability/impact rating matrix

probability scale: 0.0 – 1.0

0.0 means no probability

1.0 means certainty

Ordinal scale defines relative probability from very unlikely to almost certain, can also be used.

Alternatively, specific probabilities could be denoted general scale: .1/.3/.5/.7/.9.

Qualitative Risk Analysis

Project Risk Management

Probability/impact rating matrix

impact scale can be

Cardinal: assigning linear values .1/.3/.5/.7/.9, or non-linear values .05/.1/.2/.4/.8 showing an organization's desire to avoid high impact risks.

Ordinal: simply rank-ordering, such as very low, low, moderate, high, very high.

Project Risk Management

Probability/impact rating matrix

- each risk is rated on its probability and impact of happening on a project objective (cost, schedule, scope, and quality) if it does happen
- an organization's thresholds for low, moderate, or high are depicted in PI Matrix
- and determine if the risk is scored low, moderate, or high for that project objective

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Qualitative Risk Analysis

*Probability and Impact Matrix

Risk Score

Probability	Threats					Opportunities				
0.90	0.05	0.09	0.18	0.36	0.72	0.72	0.36	0.18	0.09	0.05
0.70	0.04	0.07	0.14	0.28	0.56	0.56	0.28	0.14	0.07	0.04
0.50	0.03	0.05	0.10	0.20	0.40	0.40	0.20	0.10	0.05	0.03
0.30	0.02	0.03	0.06	0.12	0.24	0.24	0.12	0.06	0.03	0.02
0.10	0.01	0.01	0.02	0.04	0.08	0.08	0.04	0.02	0.01	0.01
	0.05	0.10	0.20	0.40	0.80	0.80	0.40	0.20	0.10	0.05

**Source:* The Project Management Institute, *A Guide to the Project Management Body of Knowledge,* (*PMBOK® Guide)–Fourth Edition,* Project Management Institute, Inc., 2008. Figure 11-10, page 293.

Project Risk Management

Risk Data quality assessment

We need accurate and unbiased data for our analysis of risks to be really useful. So we must test them for their degree of correctness by determining:

- **Extent of understanding of the risk**
- **Data availability on the risk**
- **Quality of data**
- **Reliability and integrity of data**

Qualitative Risk Analysis

Project Risk Management

Risk categorization

1) by sources of risk: RBS
2) by area of the project affected: WBS
3) other useful category: phase

To DETERMINE AREAS OF PROJECT MOST EXPOSED TO THE EFFECTS OF UNCERTAINTY!

Group risks by common root causes for effective risk responses!!!

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Risk urgency assessment
tells which risks need to be addressed in near term.
INDICATORS:

1) Time to effect a risk response
2) Symptoms and warning signals
3) Risk rating

Qualitative Risk Analysis

Project Risk Management

Expert judgment

From experts having recent experience of having Managed such projects.

Used to assess the probability and impact of each risk To determine its location in the Matrix.

To remove bias this should be obtained by using risk facilitation workshops or interviews.

Project Risk Management

Risk register updates

We had initiated the risk register during risk identification. We fill up the relevant information from this process in it. Thus we update it, writing:

1) Relative ranking or priority of list of the project risks
2) Risks grouped by categories
3) List of risks needing near-term response
4) List of risk for additional analysis and response
5) Watch lists of low priority risks
6) Trends in qualitative risk analysis

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Qualitative Risk Analysis

Project Risk Management

Risk Register updates

Output of Risk identification	Output of qualitative risk analysis				
✓List of identified Risks ✓List of potential Responses ✓Root causes of Risks	-Relative Ranking or priority of list of the project risks -Risks grouped by categories -List of risks needing near term response				

Project Risk Management

Relative ranking or priority of list of the project risks

PI matrix classifies risks according to their individual significance! **This helps project manager focus on high-importance items where responses can lead to better project outcomes!!**

- RISKS SHOULD BE LISTED BY PRIORITY SEPARATELY FOR TIME, COST, SCOPE, AND QUALITY. **WHY?**
- Because organizations may value *one objective over another!*
- Please don't forget to write the basis for assessed probability and impact for important risks.

Project Risk Management

Risks grouped by categories

Very important!

1) Reveals COMMON ROOT CAUSES of risk or project areas needing specific attention!

2) Improves effectiveness of risk response due to our finding CONCENTRATIONS of risk.

List of risks requiring response in the near-term

We should place separately risks needing urgent attention and risks needing later attention.

Project Risk Management

List of risks for additional analysis and response

Which risks need further analysis and more active management? High or moderate ones.

You go ahead with their Quantitative Risk Analysis and pay more attention to planning response for them and their subsequent management.

Project Risk Management

Trends in qualitative risk analysis results

You get various trends in results of qualitative risk analysis as you repeat it.

These trends may help you decide:

whether risk response and further analysis is more or less urgent, and important or not.

Project Risk Management

*Perform QUANTITATIVE RISK ANALYSIS

*The process of numerically analyzing the effect of identified risks on overall project objectives.

*This definition is taken from the Glossary of the Project Management Institute, *A Guide to the Project Management Body of Knowledge,* (*PMBOK® Guide)–Fourth Edition,* Project Management Institute, Inc., 2008.

Project Risk Management

Perform QUANTITATIVE RISK ANALYSIS

- Hence, analyzes the prioritized risks showing potential and substantial impact on project's competing demands
- **Presents a quantitative approach to "DECISION MAKING" amidst uncertainty**
- **Deploys techniques:**
  - **Monte Carlo Simulation**
  - **Decision Tree Analysis**

Project Risk Management

TO: 1) determine realistic and achievable scope, schedule, cost targets in the backdrop of identified / quantified risks

2) evaluate possibility of achieving a specific project objectives

TO: 3) quantify risk exposure for the project and decide schedule and cost contingency reserve

Project Risk Management

TO: 4) determine risks *needing most attention by quantifying their relative contribution to overall project risk*

5) quantify the probable outcomes for the project their probabilities

6) arrive at the best project management amidst some uncertain outcomes

QUANTITATIVE RISK ANALYSIS

- **Normally follows qualitative risk analysis, but Experienced Managers may prefer it immediately after risk identification**
- **May not be needed in some cases for developing effective risk response**

QUANTITATIVE RISK ANALYSIS

- requirement of methods on a project is decided by:
  a) availability of time and budget
  b) need for qualitative or quantitative statements about risks and consequences

Project Risk Management

QUANTITATIVE RISK ANALYSIS

- **MUST be repeated after:**
  - **a) risk response planning**
  - **b) part of risk monitoring and control**

TO EVALUATE WHETHER OVERALL PROJECT RISK HAS BEEN DECREASED TO SATISFACTION

Project Risk Management

QUANTITATIVE RISK ANALYSIS

- **TRENDS CAN HIGHLIGHT THE NECESSITY:**

FOR MORE OR LESS RISK MANAGEMENT ACTION

Perform Quantitative Risk Analysis Process

To master this process, we will now deliberate on the following three questions:

1. **What do we need?**
2. **How we perform it?**
3. **What do we achieve?**

Answering these questions will make us understand the process well.

Project Risk Management

Organizational process assets provide from industry or proprietary sources:

1. Information on previous similar projects
2. Studies of similar projects
3. Risk databases

Project Risk Management

Risk management plan
Provides ***for this process***:

- roles & responsibilities
- Budgets and schedule activities
- Risk categories, RBS
- Revised stakeholders' tolerances,

Project Risk Management

Risk register

Provides ***key inputs***:

- List of identified risks
- Priority list of project risks
- Risks grouped by categories

Project Risk Management

- Schedule management plan, sets format and establishes criteria for developing and controlling project schedule.
- Cost management plan, sets the format and establishes criteria for planning, structuring, estimating, budgeting, and controlling project costs.

Project Risk Management

Data gathering & representation techniques

1) Interviewing
2) Probability distributions
3) Expert judgment

Project Risk Management

Interviewing

Derive information from stakeholders and subject matter experts by interviewing them. Information needed depends on what type of probability distribution we are going to use.

Quantifying risks?
What is your first step?
Answer:
"Conduct risk interview with Project stakeholders and subject matter experts".

Quantitative
Risk
Analysis

Project Risk Management

Probability distributions:

Don't forget to document The RATIONALE OF RISK RANGES!

Why?

Because it will help you make "Effective Risk Response Strategies" during risk Response planning.

- **Triangular distribution/Mean and Standard deviation for Normal and Log Distributions: For these, we gather information on the optimistic (low), pessimistic (high), and most likely scenarios, shown in slide ahead.**
- **Continuous probability distributions: show both probability and consequences of project component.**
- **Common distribution types: uniform, normal, triangular, beta, and log normal.**

Project Risk Management

Risk interview

Breaks the myth of conventional estimate (arrived at totaling most likely estimates).

Actually, conventional estimate is relatively unlikely.

Identifies *three point estimates for each WBS!*

Quantitative Risk Analysis

Project Risk Management

EXAMPLE: INTERVIEW DEPLOYING BETA DISTRIBUTION

Mean = O + 4 M + P / 6 , Standard Deviation = P – O / 6, Variance = $(P - O / 6)^2$

ACTIVITY NAME	LOW	MOST LIKELY	HIGH	MEAN	SIGMA	VARIANCE
	O	M	P	$\overline{X}$	σ	σ^2
A	4	6	10	6.3	1	1
B	16	20	35	21.8	3.2	10
C	11	15	23	15.7	2	4
Total estimate		41		43.8	3.9	15

Quantitative Risk Analysis

Project Risk Management

EXAMPLE: INTERVIEW DEPLOYING TRIANGULAR DISTRIBUTION

$$\text{Mean} = O + M + P / 3, \quad \text{Variance} = \left(P - O / 6\right)^2 + (M - O)(M - P) / 18$$

ACTIVITY NAME	LOW	MOST LIKELY	HIGH	MEAN	SIGMA	VARIANCE
	O	M	P	$\overline{X}$	σ	σ^2
A	4	6	10	6.7	1.2	1.5
B	16	20	35	23.7	4.2	17.4
C	11	15	23	16.3	2.5	6.2
Total estimate	41			42.4	5	25.1

Project Risk Management

Expert judgment

used to validate data and techniques.

experts could be internal or external.

experts needed: engineering or statistical experts.

Project Risk Management

Quantitative risk analysis and modeling techniques:

1) Sensitivity analysis
2) Expected monetary value analysis
3) Decision tree analysis
4) Modeling and simulation

Project Risk Management

Sensitivity analysis

Want to know which risks have the most potential impact on the project? Sensitivity analysis does the same for you. It builds a tornado diagram.

How? Well, it examines the extent to which the uncertainty of each project element impacts the objective you are examining.

(caution: keep all other uncertain elements at their baseline values).

Project Risk Management

Expected monetary value analysis

A statistical concept, an analysis under uncertainty. Calculates average outcome scenarios that may or may not happen.

EMV of opportunity shown as positive values

EMV of threats shown as negative values

EMV = Value of each possible outcome x Probability, and add them together.

Project Risk Management

Expected monetary value analysis

commonly used in decision tree analysis. But modeling and simulation are more powerful and can not be misused compared to it.

Project Risk Management

Decision tree analysis

Build or upgrade an exiting plant? Make or outsource? Or any other such dilemmas face you! Don't worry take the help of Decision Tree.

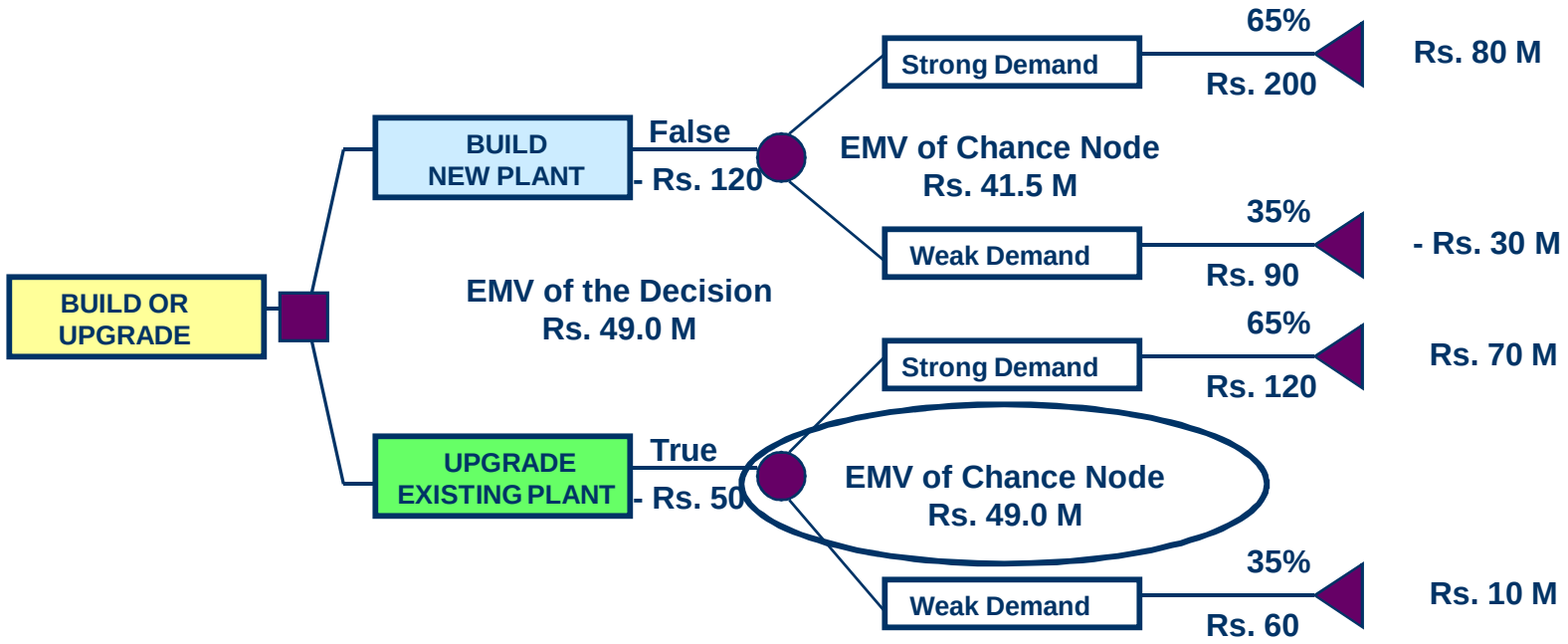
What is decision tree?

- **It's a tree-like diagram.**
- **Begins with the decision to be evaluated, say Build or upgrade.**
- **Branches are logical path of available alternatives.**
- **Each branch shows probabilities of risks and associated costs or rewards.**
- **Solving three shows you which decision provides "greatest expected value" to you (after quantifying all uncertain implications, costs, rewards, and subsequent decisions).**

Quantitative Risk Analysis

*Decision Tree Diagram

Decision Definition	Decision Node	Chance Node	Net Path Value
Decision to be Made	Input: cost of decision Output: decision made (true, false)	Input: scenario probability Output: expected monetary Value (EMV)	Computed: Payoffs – costs Along path



Source: The Project Management Institute, *A Guide to the Project Management Body of Knowledge,* (*PMBOK® Guide)–Fourth Edition,* Project Management Institute, Inc., 2008. Figure 11-15, page 299.

Project Risk Management

Simulation

Translates uncertainties (specified at a detail level) into potential impacts on project objectives expressed at whole project level.

Most popular software: Monte Carlo

- **WBS is used for simulation for cost risk analysis**
- **PDM schedule is used for schedule risk analysis**

Project Risk Management

Risk register updates

We had initiated the risk register during risk identification. We fill up the relevant information from this process in it. Thus we update it further, writing:

1) Probabilistic analysis of the project
2) Probability of achieving cost and time objectives
3) Prioritized List of quantified risks

Quantitative Risk Analysis

Project Risk Management

Risk Register updates

Output of Risk identification	Output of qualitative risk analysis	Output of quantitative risk analysis			
✓List of identified Risks ✓List of potential Responses ✓Root causes of Risks ✓Updated risk categories	-Relative Ranking or priority of list of the project risks -Risks grouped by categories -List of risks needing near term response	-Probabilistic analysis of the project -Probability of achieving cost and time objectives -Prioritized List of quantified Risks -Trends in QRA			

Project Risk Management

PROBALISTIC ANALYSIS OF THE PROJECT

Provides predictions of potential project schedule and cost results detailing expected completion dates or project duration and costs- along with concerned confidence levels

PROBABILITY OF ACHIEVING THE COST AND TIME OBJECTIVES

Using quantitative risk analysis, we can estimate the probability of achieving the project objectives- under the current plan and given knowledge of the risks.

Project Risk Management

Prioritized list of quantified

Risks **(with a measure of their impact)**

This list contains the risks that indicate:

- Major threat, or
- Major opportunity

Project Risk Management

Trends in Quantitative Risk Analysis

With the repetition of the quantitative risk analysis, a trend in its results emerges.

Project Risk Management

*PLAN RISK RESPONSES

*The process of developing options and determining actions **to ENHANCE Opportunities and REDUCE threats to "the project objectives."**

*This definition is taken from the Glossary of the Project Management Institute, *A Guide to the Project Management Body of Knowledge,* (*PMBOK® Guide)–Fourth Edition,* Project Management Institute, Inc., 2008.

Project Risk Management

PLAN RISK RESPONSES

- Follows the processes of qualitative and quantitative risk analysis
- Involves identification of risk response owners to carry through the responsibility of each agreed and funded risk response
- Deals with risks as per their priority

Project Risk Management

PLAN RISK RESPONSES

- incorporates needed resources and activities into:
  - a) schedule
  - b) budget
  - c) project management plan

Project Risk Management

PLAN RISK RESPONSES

- MUST be appropriate to:
  - a) the importance of risk
  - b) timely
  - c) cost-effective
  - d) agreed upon by "ALL PARTIES"
  - e) owned by a *responsible person*

PLAN
RISK RESPONSES

Project Risk Management

KEY PONITS NEED EMPHASIS AGAIN!

Risk response planning:

- Should correspond to severity of risk
- Should be cost effective
- Should be realistic
- Should be consented by all involved parties
- Should be owned by a responsible person

"MOST OFTEN RISK RESPONSE DOES NOT GIVE US INTENDED RESULTS BECAUSE ONE OR MORE OF THESE KEY PONITS ARE IGNORED" !

Plan Risk Responses Process

To master this process, we will now deliberate on the following three questions:

1. **What do we need?**
2. **How we perform it?**
3. **What do we achieve?**

Answering these questions will make us understand the process well.

Project Risk Management

Risk management plan

provides:

- Roles & responsibilities
- Risk threshold for L, M, H risks
- Time and budget for project risk management
- Risk analysis definitions

Project Risk Management

Risk register

Was created in risk identification process, updated with outputs of qualitative and quantitative risk analysis. We use these outputs here:

1) From risk identification

- Identified Risks, their root causes
- List of potential responses
- Risk owners
- Symptoms & warning signs

Project Risk Management

Risk register

We use these outputs here:

2) From qualitative risk analysis

- Priority list of risks
- Risks needing near-term response
- Risks for additional analysis and response
- Trends in qualitative risk analysis results
- Root causes
- Risks grouped by categories
- Watchlist of low priority risks

Project Risk Management

Risk register

We use these outputs here:

2) From quantitative risk analysis

- Probabilistic analysis of the project
- Probability of achieving cost and time objectives
- Prioritized list of quantified risks
- Trends in quantitative risk analysis results

Project Risk Management

RISK OWNERS MUST PARTICIPATE
IN DEVELOPING
RISK RESPONSES

Project Risk Management

WHICH STRATEGIES WILL YOU CHOOSE?

ANSWER:

- **First, the MOST EFFECTIVE STRATEGY for each risk**
- **Then, BACKUP STRATEGIES in case the best one fails**
- **After choosing Primary and Backup Strategies, develop actions to implement them**
- **A fallback plan if selected strategy not fully effective, or if accepted risk occurs**

Project Risk Management

Avoid

Eliminate threat by eliminating the cause! You change project plan to eliminate the threat, to isolate the project objective from the its impact, or to relax the objective that is in jeopardy.

- Extending schedule or reducing scope

Some risk that arise early can be avoided by:

- Clarifying requirements
- Obtaining information
- Improving communication or
- Acquiring expertise

Project Risk Management

Transfer

Can you shift the risk?

Yes, you can.

Project Risk Management

Transfer

You can shift it to third party for its ownership.

But remember, it is just shifted, the risk remains.

Only its ownership and management is off-loaded to the third party for which due premium is paid by you.

Risk transference is found most effective in transferring financial risk exposure.

Project Risk Management

Transfer

EXAMPLES

- ✓ Insurance
- ✓ performance bonds,
- ✓ warranties,
- ✓ guarantees
- ✓ Contracts (a fixed-price contract has least with the buyer. A cost reimbursable one leaves more risk with the buyer)

Project Risk Management

Mitigate

A very important response technique. We should try to master it.

Here, we attempt to reduce the probability and/or consequence of a negative risk to acceptable threshold.

Project Risk Management

Mitigate

CARDINAL PRINCIPLE

Take *early action* to reduce probability of a risk's occurrence or its consequence on the project objectives.

- **It is far better than making whole lot of repairs after it has taken place.**

"A STICH IN TIME SAVES NINE"!

Project Risk Management

Mitigate

Mitigation costs should be justified in view of the likely risk probability and its impact.

EXAMPLES

- Implementing a new course of action
- Adopting a less complex process
- Conducting more seismic/engineering tests
- Choosing more reliable seller
- Adding resources/time to schedule
- Developing prototypes
- Designing redundancy into a system

Project Risk Management

Exploit

Chosen for risks with positive impacts to ensure that the opportunity is realized. It tries to eliminate the uncertainty of an upside risk by making the opportunity surely happen.

Examples:

- Assigning more talented resources to reduce time to completion
- To provide better quality than originally planned

Project Risk Management

Share

Sharing a positive risk involves allocating ownership with a third party who is best able to capture the opportunity.

Examples:

- Forming risk-sharing partnerships, teams, special purpose companies, JVs for the sole purpose of managing opportunities.

Project Risk Management

Enhance

This strategy modifies the size of an opportunity by:

1) Increasing probability and positive impact
2) Identifying and enhancing key drivers of these risks.

This means seeking to facilitate/strengthen the cause of opportunity and reinforcing its trigger conditions. Impact drivers are also targeted.

Project Risk Management

Accept

This approach shows your project team has agreed:

- not to change project plan in order to deal with a risk, or
- is unable to find out any appropriate response strategy

This approach may be adopted both threats and opportunities.

Project Risk Management

Accept

ACTIVE ACCEPTANCE

Your acceptance may be active and you develop a contingency plan.

PASSIVE ACCEPTANCE

It may be passive. Do nothing- leaving the project team to deal

with the risks as they happen.

Project Risk Management

FAQ

How much contingency allowance should be kept?

Answer: It is determined by the impacts. Compute it at an acceptable level of risk exposure.

Accept

Most common risk acceptance response is establishing a contingency plan/reserve that incorporates amounts of:

- Money
- Time.
- Resources

to address *accepted* identified risks
Or even sometimes potential unknown threats and opportunities)

Project Risk Management

CALCULATING COST RESERVE

Accept

Risk	Probability	IMPACT COST = - tive Benefits = + tive	Expected Monetary Value (EMV)
A	20%	- Rs. 4000	- Rs. 800
B	45%	+ Rs. 3000	+ Rs. 1350
C	10%	+ Rs. 2100	- Rs. 210
D	65%	- Rs. 2500	- Rs. 1625

BENEFIT : Rs. + 1560, WE WILL SAVE
COST : Rs. - 2425, WE WILL SPEND
CONTINGENCY AMOUNT NEEDED : Rs. 865

Project Risk Management

CALCULATING COST RESERVE: Hands-on Exercise for Students

For a product modification project, we have following data. Please calculate Cost Reserve!

RISK THREATS OPPORTUNITIES	Probability	IMPACT COST = - tive Benefits = + tive
Delay in shipment of parts	30%	- Rs. 9000
Parts need extra installation work	25%	+ Rs. 3500
Design defect will cause rework	5%	- Rs. 5000
Parts will be cheaper than expected	20%	+ Rs.10000
Production will be simpler than expected	30%	+ Rs. 2500

PMAC
Project Management Advancement Center

Project Risk Management

CALCULATING COST RESERVE: hands-on Exercise for Students

RISK THREATS OPPORTUNITIES	Probability	IMPACT COST = - tive Benefits = + tive	Expected Monetary Value (EMV)
Delay in shipment of parts	30%	- Rs. 9000	- Rs. 2700
Parts need extra installation work	25%	+ Rs. 3500	- Rs. 875
Design defect will cause rework	5%	- Rs. 5000	- Rs. 250
Parts will be cheaper than expected	20%	+ Rs.10000	+ Rs. 2000
Production will be simpler than expected	30%	+ Rs. 2500	+ Rs. 750

BENEFIT : Rs. + 2750, WE WILL SAVE
COST : Rs. - 3825, WE WILL SPEND
CONTINGENCY AMOUNT NEEDED : Rs. 1075

Project Risk Management

Contingent response strategy

Designed for use only when CERTAIN EVENTS occur. Why? Well, for some risks, it's better to make a response plan that will be used only under certain predefined conditions (when there will be sufficient warning to implement the plan).

Events that trigger contingency response:

1) Missing intermediate milestones
2) Gaining higher priority with a supplier

Project Risk Management

Expert judgment

From knowledgeable parties, inputs can be taken regarding actions for specific and defined risks.

Project Risk Management

STRATEGIES FOR RISK RESPONSE

CONTINGENCY AMOUNT

- Can be added to individual activities or work packages, or to the project as a whole

Project Risk Management

Risk register updates

We fill the outputs in the risk register. At this point, the risk register contains:

- Identified risks with descriptions, concerned area of project like WBS element, their causes, and how they may impact project objectives
- outputs from qualitative and quantitative risk analysis
- Risk owners and their assigned responsibilities
- Budget and times for responses

Project Risk Management

Risk register updates

We fill the outputs in the risk register. At this point, the risk register contains:

- Expected level of residual risks
- Consented responses for each risk and specific actions for chosen response strategy
- Symptoms and warning signals of risks occurrence
- Budget and schedule activities for implementing chosen responses
- Contingency reserves of time and cost designed to provide for stakeholders' risk tolerances
- Contingency plans and trigger that call for their execution

Project Risk Management

Risk register updates

We fill the outputs in the risk register. At this point, the risk register contains:

- Fallback plans if primary response inadequate
- Residual risks expected to remain after planned responses have been taken and those that have been deliberately accepted
- Secondary risks that arise as a direct outcome of implementing a risk response
- Contingency reserves calculated on the basis of quantitative risk analysis and organization's risk thresholds

Project Risk Management

Project management plan updates

Updated as response activities are added to it after review and approval through Integrated Change Control. Integrated change control is applied in the Direct and Manage Project Execution process. Why? To make sure that agreed-upon actions are implemented and monitored as part of the progressing project.

Risk response strategies are fed back into concerned processes in other knowledge areas (WBS, budget, schedule).

Project Risk Management

Risk-related contractual agreements

Contractual agreements are prepared to specify each party's responsibility for specific risks, in case they occur.

Example:

Agreements for insurance, services, and other items as found suitable.

Project Risk Management

Project document updates

Example:

1) Assumptions log updates
2) Technical documentation updates

Executing Process Group

EXECUTING PROCESS Group

Executing processes

EXECUTING PROCESS GROUP

THE CONCEPT

Involves:

1) Coordinating **PEOPLE** and **RESOURCES,**
2) Integrating and performing the activities according to the project management plan,
3) Addressing the defined scope,
4) Implementing approved changes.

Executing processes

EXECUTING PROCESS GROUP

THE CONCEPT

Requires some replanning: **Due to normal execution variances**

Examples of general variances:

a) Activity duration variances
b) Resource productivity variances
c) Resource availability variances
d) Unanticipated risks (variance from what risks you had expected)

Executing processes

EXECUTING PROCESS GROUP

THE CONCEPT

These variances: May or may not impact the project management plan. But you must analyze them! WHY?

Because the results of your analysis may:

1) Trigger a change request
2) If the change request is approved, it would modify the project plan and MAY NEED REBASELINING!!

EXECUTING PROCESS GROUP

processes

1) **Direct and Manage Project Execution**
2) **Acquire project team**
3) **Develop project team**
4) **Manage project team**
5) **Perform quality assurance**
6) **Distribute information**
7) **Manage stakeholders expectations**
8) **Conduct procurements**

Monitoring and Controlling

MONITORING & CONTROLLING PROCESS GROUP

Monitoring and Controlling

The concept of Monitoring and Controlling

1.Checking performance
2. Managing changes

Monitoring and Controlling

1.Checking performance against the plan or baselines by conducting variance analysis. Variance analysis means comparing actual with the plan.

Formula = Plan – Actual

Example: if you want to check my scope performance, please compare the scope performed with the scope planned.

Monitoring and Controlling

Example: if you want to check my schedule performance, please compare the actual start and finish dates of a work completed and actual time taken in doing it **with** the dates planned and duration written in schedule baseline (approved schedule). It will give you schedule variance, called performance measurements, that may be:

SV = 0 or SV = + or SV = -

Monitoring and Controlling

Checking performance

In case of variance:

1) Find causes of variance,
2) Find corrective action to recover,
3) Recommend it for approval.

Perform Integrated Change Control process will review it and then approve.

Monitoring and Controlling

Once approved, then :

1) Give it execution for implementation,
2) Write approved changes in the project management plan. This is called versioning and done with the help of configuration management system. You had original project management plan and when you write approved changes, its version or configuration changes.

Monitoring and Controlling

You must retain all versions! This will help us understand evolution of project management plan through approved changes during the project life cycle.

Also update project documents. We will learn more on it as we proceed. Right now, we are talking about the concept.

Monitoring and Controlling

Once approved, then :

3) Inform concerned stakeholders about approved changes.

This was about the first part of the concept of Monitoring and Controlling. Now, the second part: Managing Changes.

Monitoring and Controlling

2. Managing Changes: changes to scope, schedule, cost, and quality. There is a standard change control procedure.

Step one ⇨	Step two ⇨	Step three ⇨	Step four
Change Request	**Evaluation, Impact Analysis**	**Recommend for approval.**	**Review and then approval or rejection.**

Monitoring and Controlling

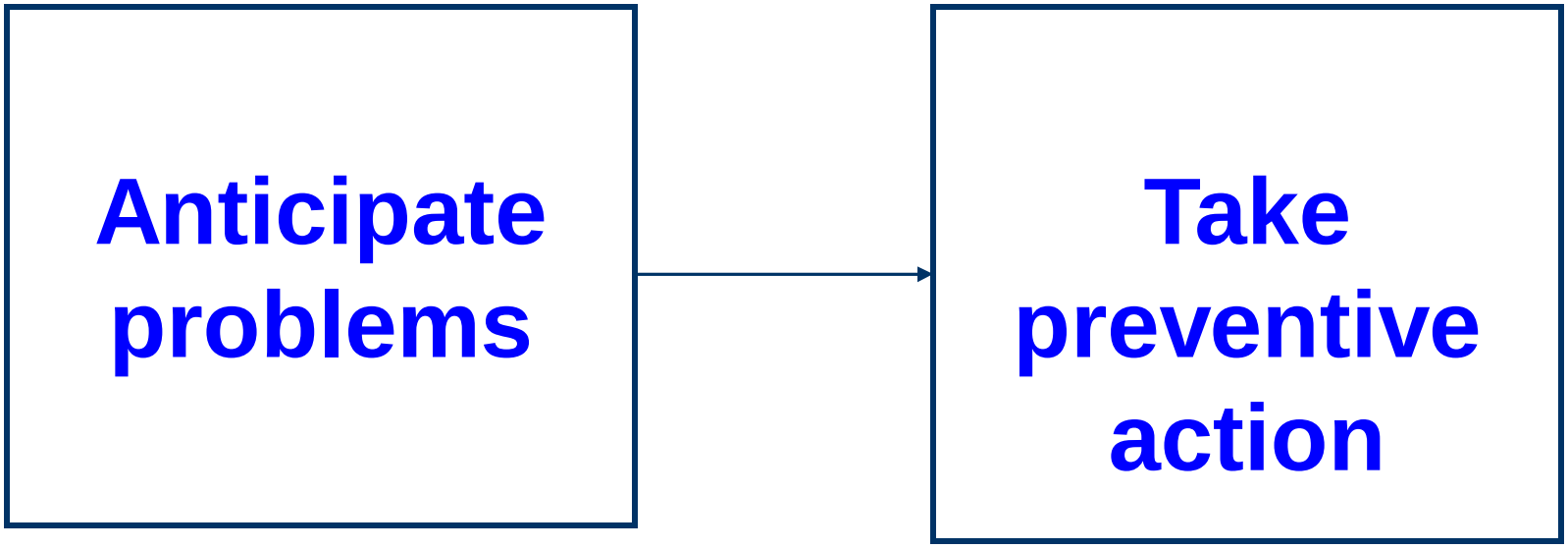
2. Managing Changes:

Once approved, then:

1) Give it to execution for implementation
2) Write approved changes in project management plan.
3) Update project documents.
4) Inform concerned stakeholders about approved changes.

Controlling Concepts

"Prevention is better than cure"



Monitoring & Controlling Concepts

Purposes
of
Project control

- Identify problems
- Solve problems
- Get the project back on track as soon as possible after problem has been identified!

Monitoring and Controlling

CONCEPT

THIS process group consists of processes to

- observe project execution,
- identify problems in timely manner,
- recommend corrective action for problems that have occurred,
- recommend preventive action in anticipation of possible problems,
- thus bring the project into compliance with the project management plan.

Monitoring and Controlling

CONCEPT

Key benefit

- **project performance** is observed and measured regularly.
- **continuous monitoring** suggests areas that need attention in order to complete the project within baselines.

Monitoring and Controlling

CONCEPT

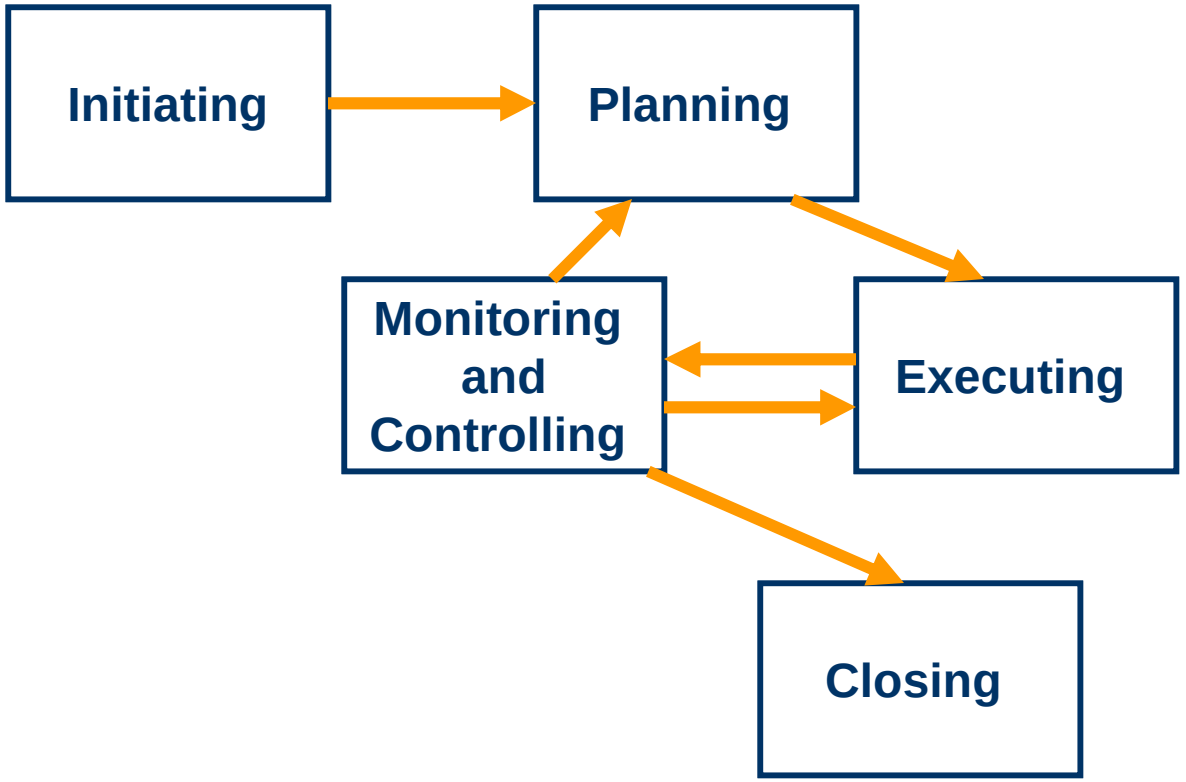
Key benefit

- **Monitors and controls** the entire project effort!
- **When variances** require revisions and changes, we raise change request which are reviewed for necessary actions in favour of meeting project objectives!

example

Monitoring and Controlling

Dynamics of Project Management Process Groups



Monitoring and Controlling

Project Risk Management

Monitor and Control Risks

***Monitor and control risks.** The process of implementing risk response plans, tracking identified risks, monitoring residual risks, identifying new risks, and evaluating risk process throughout the project.

This definition is taken from the Glossary of the Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide)–Fourth Edition,* Project Management Institute, Inc., 2008

Project Risk Management

Monitor and Control Risks

THE CONCEPT

Collect Work Performance Information from Direct and Manage Project Execution to perform VARIANCE ANALYSIS, TREND ANALYSIS, and TECHNICAL PERFORMANCE MEASUREMENT.

THE RISK MONITORING AND CONTROLLING IS AN ONGOING PROCESS DUTING THE LIFE OF THE PROJECT!

Project Risk Management

Monitor and Control Risks

THE CONCEPT

- **Making effective decisions before risk occurs is the crux of risk monitoring and control processes.**

- **You must periodically ascertain the risk acceptability level of project stakeholders by reporting information to them!**

Monitor and Control Risks Process

To master this process, we will now deliberate on the following three questions:

1. **What do we need?**
2. **How we perform it?**
3. **What do we achieve?**

Answering these questions will make us understand the process well.

Discussion on Inputs

Project Management Plan *provides us* Risk Management Plan that defines methodology to be followed while monitoring and controlling risks, roles and responsibilities of people for this process, and risk tolerances of the stakeholders.

Risk Register is the key input here, *provides*
List of identified risks with their analysis, warning signals, risk reserves, and response plans. It also provides information on residual risks and secondary risks, and low-priority risks as contained in the Watchlist!

Discussion on Inputs

Work performance information *provides*

Direct and Manage Project Execution process provides work performance information **regarding scope performance (deliverables status), time performance (time taken), cost performance (money spent), and Technical Performance (quality requirements met).**

This information helps conducting Variance Analysis, Trend Analysis, and Technical Performance Measurement!

Discussion on Inputs

Performance reports

Performance reports are generated through variance analysis (comparing actual with the plan). The data includes SV, SPI, CV, CPI, EAC, ETC, VAC.

Performance reports help us know how effectively risks are being managed, or if we need to pay more attention! It also helps conducting trend analysis.

We need to know if any performance analysis impacts the risk management processes!

Discussion on Techniques

Risk reassessment (identify new risks, reassess current ones, and close outdated one).

We reassess whether identified risks are being managed properly or not. If not, then we plan more corrective actions, get them approved, and implement them.

We reassess whether a new risk is occurring. If yes, then we immediately analyze it, design workaround plan, get it approved and implement.

Discussion on Techniques

Risk reassessment

AS PROJECT PERFORMANCE MEASURED AND REPORTED

↓ **MAY SURFACE**

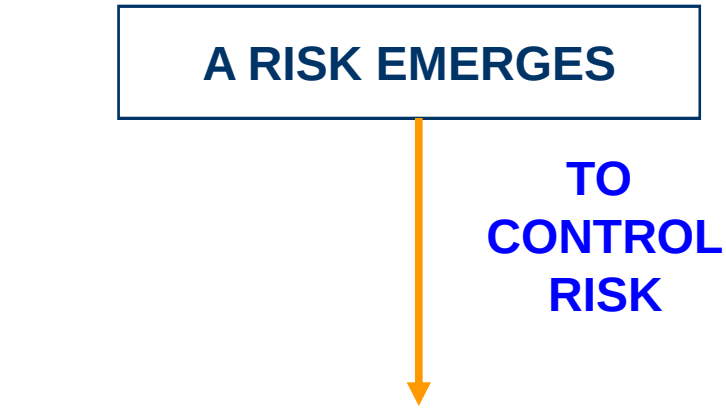
POTENTIAL RISKS NOT IDENTIFIED EARLIER

↓ **IMPLEMENT**

CYCLE OF RISK MANAGEMENT PROCESSES FOR THESE RISKS

Discussion on Techniques

Additional risk response planning



That was

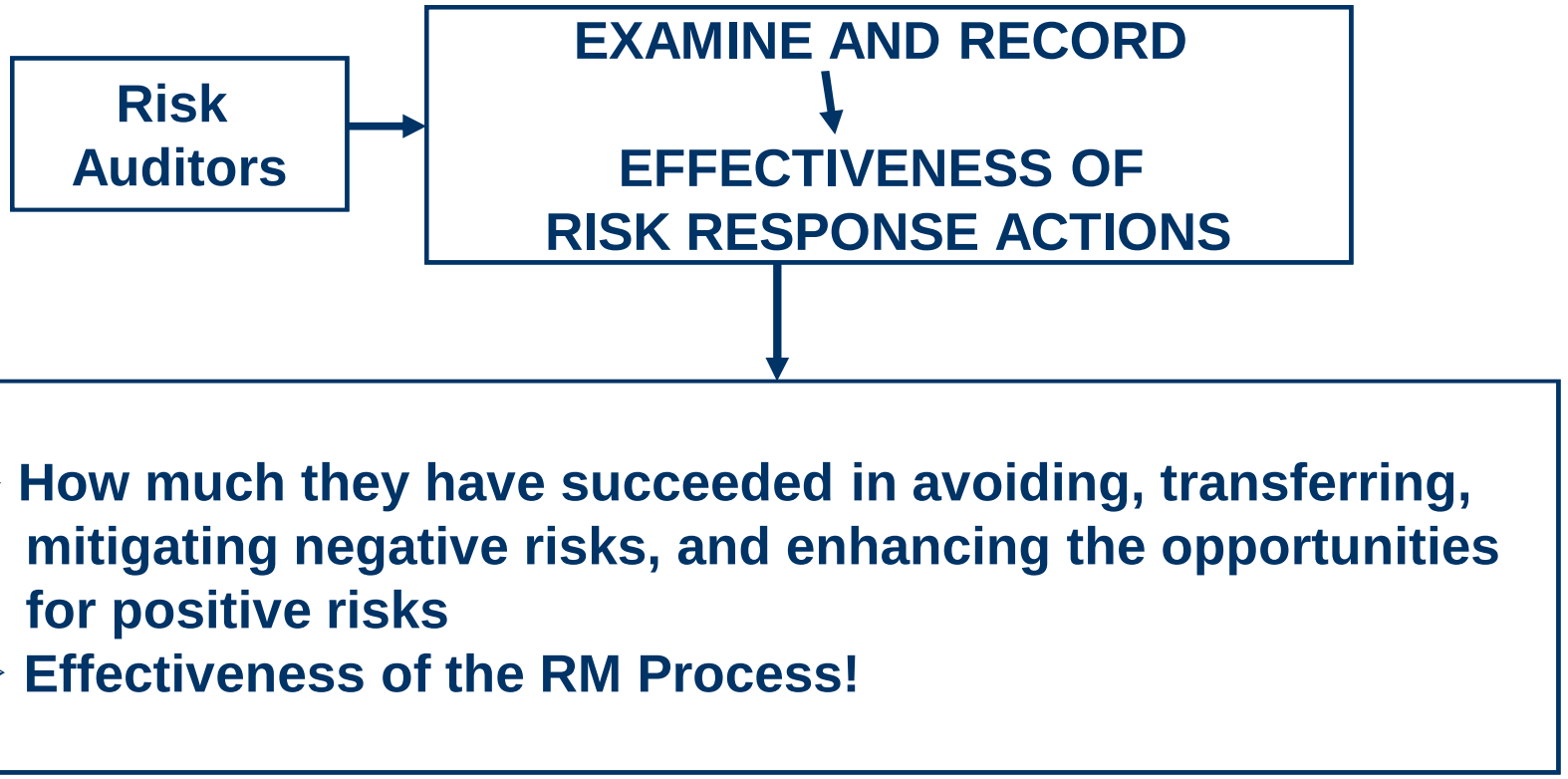
1) **Not anticipated in the Risk response plan, or**
2) **Its impact on objectives IS GREATER THAN EXPECTED**

Planned response not adequate

Monitor and Control Risks-Tools & Techniques

Risk audits

Conducted during the project life cycle



Project Risk Management

Variance & trend analysis

Variance and trend in project execution is reviewed with the help of:

1) Performance data,
2) EV Analysis,
3) Other variance and trend analysis results.

Outcomes from variance and trend analysis may forecast cost and schedule potential deviations at project completion, as an impact of threats and opportunities!

Project Risk Management

BEWARE OF SCOPE CHANGES!

WE HAVE ALREADY DISCUSSED SCOPE CHANGES!

Project Risk Management

Earned value analysis

- EV analysis (as already discussed). Used for tracking overall project performance against a baseline plan.
- Results tell us about potential deviation of the project at completion from schedule and cost objectives.
- If a project deviates substantially from the baseline, an updated risk identification and analysis must be conducted! At least you don't get surprises for the remaining project!

Project Risk Management

Technical performance measurement

Compares technical performance accomplishments during execution to the project plan's schedule for technical achievement.

Example: If a functionality planned as a milestone is not demonstrated, it poses risk to attaining project's scope!

Project Risk Management

Reserve analysis

Compares the amount of COST AND SCHEDULE contingency reserve left to the amount of risks remaining AT ANY TIME IN THE PROJECT!

To find out if the remaining contingency is sufficient for remaining risks!

Project Risk Management

Status meetings

VERY IMPORTANT TOOL!

- Risk reviews must be done regularly.
- All meetings should have it as a necessary agenda!

ALSO, PLEASE REMEMBER:

1) **As the project advances, the risk ratings and prioritization may change.**
2) **These changes may need additional qualitative and quantitative analysis.**

Project Risk Management

Risk register updates

Two categories of updates:

- Results of risk reassessments, risk audits, and risk views. Examples: updates to Probability, Impact, priority, response plans, ownership, and other items of risk register.

Project Risk Management

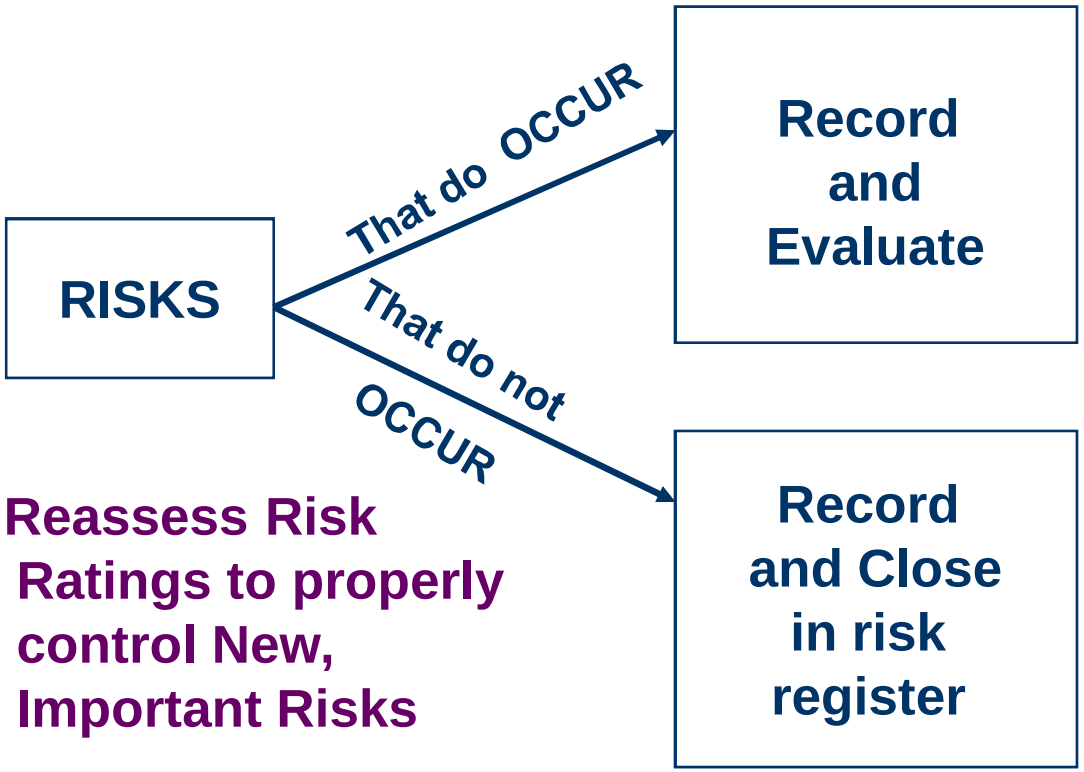
Risk register updates

Two categories of updates:

- Actual outcomes of risks and risk responses which help us plan for risk throughout our organization (for future projects). This concludes the record of risk management on the project and serves as input to Close Project process and included in project closure documents!

Project Risk Management

Risk register updates



- **Reassess Risk Ratings to properly control New, Important Risks**

Performing Risk Controls reduces the impact or probability of identified - tive Risks and enhances opportunity for + tive risks

Project Risk Management

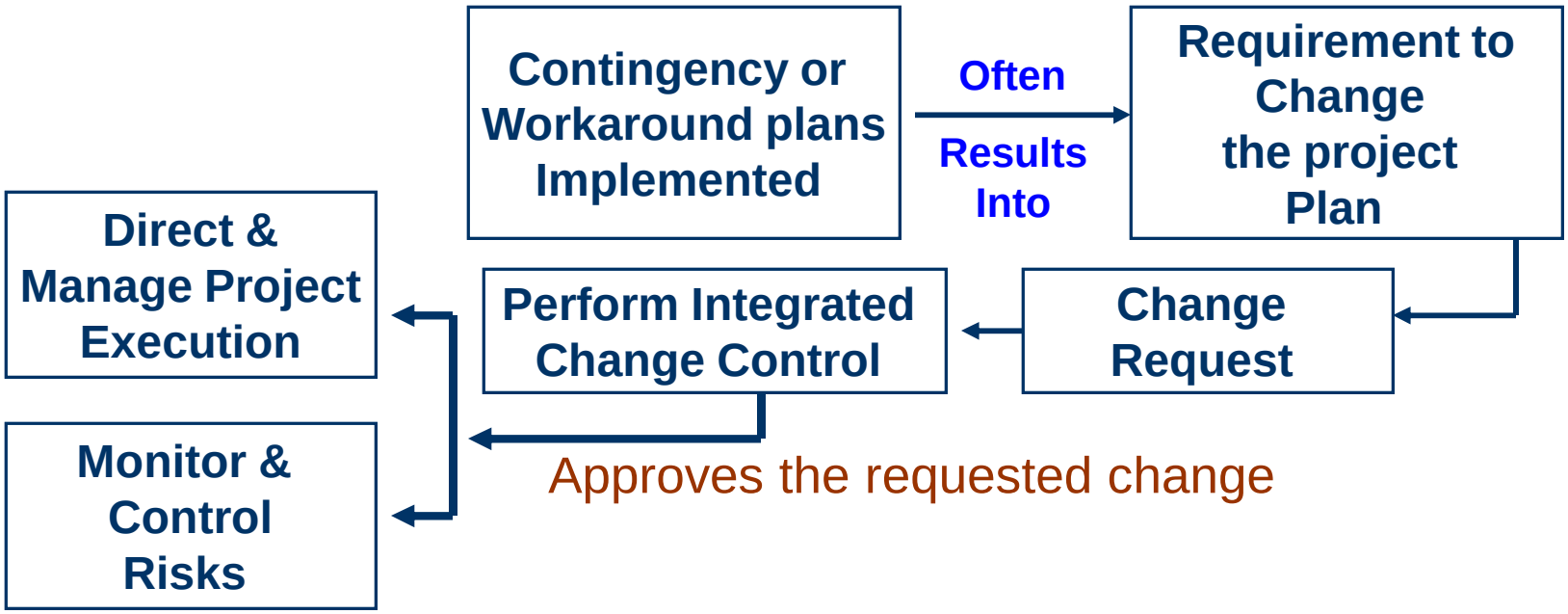
Change Requests

Frequently, the implementation of contingency or workaround plans necessitates change to PM Plan! ICC reviews and approves them.

After approval, these change requests are implemented to manage unclosed identified risk or a new risk!

Project Risk Management

Change Requests



Project Risk Management

Change Requests

Include :

- Contingency plans and workaround plans
- Workaround plans must be properly recorded. They are included in both Direct & Manage Project Execution process and Monitor & Control Project Work process! Remember!!

Project Risk Management

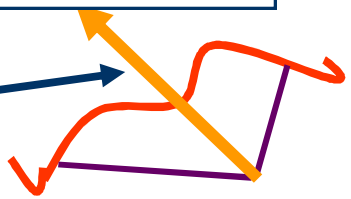
Change Requests May lead to

Workaround plans

Are Unplanned Responses to the emerging risks which were not identified or accepted passively.

RISKS
(not identified or accepted passively)

WORKAROUNDS: Unplanned Responses



DOCUMENT WORKAROUNDS IN PM PLAN AND RISK RESPONSE PLAN

Project Risk Management

Change Requests May lead to

Recommended preventive actions

Are actions taken to bring the project into compliance with Project Management Plan.

OPAs updates

All the six risk management processes provide information that can help future projects, and hence must be entered in OPAs.

examples →

Project Risk Management

OPAs updates

Examples:

1) Templates for the following can be updated at Project Closure:

- ❖ risk management plan template
- ❖ P & I Matrix template
- ❖ risk register template

2) Risks can be documented and RBS updated.

3) Risk Lessons Learned can be entered in OPAs.

Project Risk Management

OPAs updates

Examples:

4) Data on actual costs and durations can be added to organization's database.

5) Final versions of risk register and risk management plan templates are included.

Project Risk Management

Risk database (a useful repository)

RISK REPOSITORY
RISK DATA COLLECTED, MAINTAINED, And ANALYSED

USED IN

RISK MANAGEMENT PROCESSES

- **Assists risk management throughout the organization**
- **Over time, builds basis of " A RISK LESSONS LEARNED PROGRAM"**

ITS USE

Project Risk Management

Updates to risk identification checklist

ORIGINAL CHECKLIST

1.....
2.....
3.....
4.....
5.....

UPDATED BY EXPERIENCE →

Updated checklist

1.....
2.....
3.....
4.....
5.....
6.....
7.....
8.....
9.....

WILL HELP RISK MANAGEMENT OF FUTURE PROJECTS

Project Risk Management

PM Plan updates

When approved changes impact risk management processes, corresponding component documents of PM Plan are revised and reissued to reflect those changes.

Project document updates

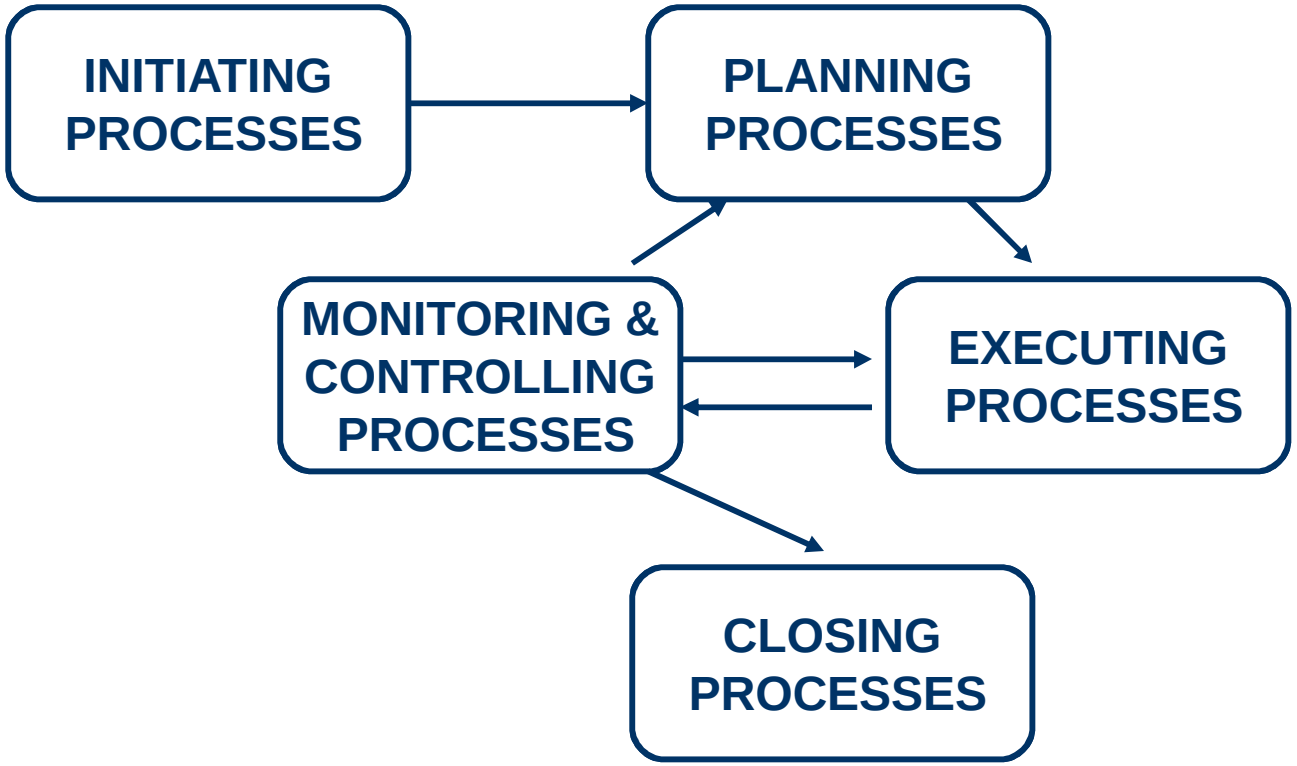
- Assumptions log updates
- Technical documentation updates

Closing Process Group

CLOSING PROCESSES

Closing Process Group

POSITION IN PROJECT MANAGEMENT LIFE CYCLE



Closing Process Group

THE CONCEPT

- **Projects are have a definite beginning and a definite end.**
- **The end is reached**
  - **1. When objectives are accomplished;**
  - **2. When it is concluded that objectives will not be / can't be achieved;**
  - **3. When the need for the project no longer exists; or**
  - **4. The project is terminated before completion (for various reasons).**

Closing Process Group

THE CONCEPT

- During closing, it is the project manager who ensures that all project-related work has been completed and formally closed out by a specific date.
- It is his / her responsibility to put an end to the project (sometimes through requirement when there is no follow-up project)!
- By the time the end-item has been delivered and installed, many people in the project will have lost the enthusiasm and be anxious to move on to another project.

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Closing Process Group

THE CONCEPT

- As a result, the project closeout gets little attention as managers shift their emphasis to upcoming projects OR scan the environments FOR LEADS about potential projects.
- YET, CLOSING A PROJECT PROPERLY IS NO LESS IMPORTANT THAN ANY OTHER PROJECT ACTIVITY!
- The process of project closeout is so critical that it can determine whether ULITIMATELY project was A SUCCCESS OR FAILURE.

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Closing Process Group

THE CONCEPT

- **UNLESS *formally* closed, the projects have a tendency to *drag on*:**
  - ✓ **Sometimes unintentionally from neglect or insufficient resources**
  - ✓ **Sometimes intentionally for lack of follow-up work**
- **Workers stay on project payroll for months after their obligations have been met, which can turn an otherwise successful project into *financial failure***

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Closing Process Group

THE CONCEPT

- As long as the project has not been ***officially*** closed, work orders remain open and labor charges continue to incur.
- The seeds of successful closeout are sown early in the project: Since closure requires customer acceptance, the "Criterion of Acceptance" SHOULD BE CLEARLY DEFINED, AGREED UPON, and DOCUMENTED at the beginning of the project.

Closing Process Group

THE CONCEPT

- Any subsequent changes to criteria (made during the project) must be approved both by contractor and customer.

- Throughout all phases of the project, the project manager must emphasize achievement of customer's acceptance criteria!

Closing Process Group

*"**Closing Processes.** Those processes performed to finalize all activities across Project Management Process Groups to formally close the project or phase."

*This definition is taken from the Glossary of the Project Management Institute, *A Guide to the Project Management Body of Knowledge,* (*PMBOK® Guide)–Fourth Edition,* Project Management Institute, Inc., 2008.

Closing Process Group

THE CONCEPT

- **The Closing Process Group processes**

Close Procurements

1) COMPLETION AND SETTLEMENT OF THE CONTRACT,

2) RESOLUTION OF OPEN ITEMS IF ANY

CLOSE PROJECT or phase

1) GENERATING, GATHERING, AND DISSEMINATING INFORMATION TO FORMALIZE PROJECT OR PHASE COMPLETION
2) EVALUATING THE PROJECT
3) COMPILING LESSONS LEARNED FOR USE IN FUTURE PROJECTS OR PHASES

Just a bit more!

Thanks a lot for learning project management.
It will help you achieve your career dreams!

You will progress in life and attain HIGH REPUTATION as worthy professional **but just a bit more…**

Just a bit more!

You are now ready to take next leap in your career. You need thinking about your professional and social responsibility.

It will make you shine out and give a great fillip to your career ahead, believe me!

Professional and Social Responsibility

- Be committed to doing **what is right and honorable.** Set high standards for ourselves and aspire to meet these standards in all aspects of our lives: at work, at home, and in service to our profession.
- Think of expectations that we have of ourselves and our fellow practitioners in the global project management community. Think of ideals to which we aspire as well as the behaviors that are mandatory in our professional roles.

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Professional and Social Responsibility

- The credibility and reputation of the project management profession is shaped by the collective conduct of individual practitioners. **All of you there!!!**
- We can advance, both individually and collectively, by embracing PMI®'s Code of Ethics and Professional Conduct.
- This Code will assist us in making wise decisions, ***particularly when faced with difficult situations where we may be asked to compromise our integrity or our values.***

Professional and Social Responsibility

Hope you are NOW excited to know about

PMI's Code of Ethics and Professional Conduct!

Professional and Social Responsibility

The four values:

- **Responsibility.** Ownership of decisions and actions.
- **Respect.** Appropriate treatment of people and resources.
- **Fairness.** Being objective and making impartial decisions.
- **Honesty.** Understanding the truth and taking action based on truth.

Responsibility

1. Make decisions and take actions based on the best interests of society, public safety, and the environment.
2. Accept assignments you are qualified for.
3. Fulfill the commitments that you undertake do what you say you will do.
4. In case of errors or omissions, take ownership and make corrections promptly. When you discover errors or omissions caused by others, communicate them to the appropriate body.

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Responsibility

5. Protect proprietary or confidential information that has been entrusted to us.

6. Be informed and uphold the policies, rules, regulations and laws that govern our work, professional, and volunteer activities.

7. Report unethical behavior or violations.

8. Only file ethics complaints when they are substantiated by facts.

9. Uphold this Code and hold each other accountable to it.

Question

You are assigned to a US $500 million project and you discover that some of the team members, experience and skills are not appropriate to the needs of the project, but you have no choice for any change in the team composition. What is the BEST thing to do?

A. Add time and cost for training and revise baselines.

B. Motivate more experienced members to work overtime.

C. Ensure that key stakeholders receive timely and complete information regarding the gaps in the skills of the concerned team members to facilitate them to take informed decisions.

D. Conduct risk analysis and note in the risk register.

Answer

C. Ensure that key stakeholders receive timely and complete information regarding the gaps in the skills of the concerned team members to facilitate them to take informed decisions.

Professional and Social Responsibility

Respect

Appropriate treatment of people and resources.

1. **Respect cultural diversity, customs, and norms.**
2. **Maintain an attitude of mutual cooperation.**
3. **Be direct in dealing with conflict.**
4. **Do not use your expertise, power or position to influence others for your own benefit at the expense of others.**
5. Negotiate in good faith.

Respect

Our duty to show a high regard for ourselves, others, and the resources entrusted to us. Resources entrusted to us may include people, money, reputation, the safety of others, and natural or environmental resources.

- **An environment of respect engenders trust, confidence, and performance excellence by fostering mutual cooperation- an environment where diverse perspectives and views are encouraged and valued.**

Fairness

Being objective and making impartial decisions.

Our conduct must be free from competing self interest, prejudice, and favoritism.

1. **Do not discriminate against others,** based on gender, race, age, religion, disability, nationality, or sexual orientation.
2. **Always look for conflict of interest and disclose them to the appropriate stakeholders.**

What is conflict of interest?

A conflict of interest occurs when we are in a position to influence decisions or other outcomes on behalf of one party when such decisions or outcomes could affect one or more other parties with which we have competing loyalties.

For example, when we are acting as an employee, we have a duty of loyalty to our employer.

Even if we believe that we can set aside our divided loyalties and make decisions impartially, we treat the appearance of a conflict of interest as a conflict of interest !

Fairness

Being objective and making impartial decisions. Our conduct must be free from competing self interest, prejudice, and favoritism.

3. Do not hire or fire, reward or punish, or award or deny contracts based on personal considerations, such as, favoritism, nepotism, or bribery.

4. Demonstrate transparency in the decision-making process.

Honesty

Understanding the truth and taking action based on truth.

1. **Seek to understand the truth.**
2. **Be truthful in communications and conduct.**
3. **Provide accurate information in a timely manner.**
4. **C**reate an environment in which others feel safe to tell the truth.
5. Make commitments and promises, implied or explicit, in good faith.

Honesty

Understanding the truth and taking action based on truth.

6. Do not engage in or condone behavior that is designed to deceive others, such as, making misleading or false statements, stating half-truths, providing information out of context or withholding information that, if known, would render our statements as misleading or incomplete.

7. Do not engage in dishonest behavior with the intention of personal gain or at the expense of another.

A Game

You will see 25 jumbled up sentences in next two pages. Your task is to assign right numerical values against the sentences choosing:

R1 for Responsibility

R2 for Respect

F for Fairness

H for Honesty

A Game

1. Do not deceive people.
2. Do not discriminate.
3. Observe laws.
4. Respect cultural diversity.
5. Generate an environment where others follow truth.
6. Make decisions based on best interests of the organization you work for.
7. Obey copyright laws and protect proprietary information.

A Game

8. Acknowledge your own errors and omissions.
9. Inform superiors gap in your experience before accepting assignment.
10. Report unethical behavior.
11. Tell truth in all communications.
12. Maintain an attitude to foster mutual cooperation.
13. Be direct in dealing with conflict, whatsoever!

A Game

14. Have you understood reality? Or just swayed away by someone influencing you?
15. Make sure information is truthful.
16. Uncover conflict of interest.
17. Acting impartially.
18. Don’t use position for your own gain.
19. Don’t say negative things that could insult others.
20. Negotiate in good faith.

A Game

21. Do not misuse your position for your own gain.
22. Make commitment you can fulfill.
23. Do not agree for assignments you are not qualified for.
24. Follow copyright law, other laws of the land, and propriety information you are using.
25. Report violations.

A Game

Answers

A Game

1. Do not deceive people. H= Honesty
2. Do not discriminate. F= Fairness
3. Observe laws. R1= Responsibility
4. Respect cultural diversity. R2= Respect
5. Generate an environment where others follow truth. H= Honesty
6. Make decisions based on best interests of the organization you work for. R1
7. Obey copyright laws and protect proprietary information. R1= Responsibility

A Game

8. Acknowledge your own errors and omissions. R1= Responsibility
9. Inform superiors gap in your experience before accepting assignment. R1= Responsibility
10. Report unethical behavior. R1=Responsibility
11. Tell truth in all communications. H= Honesty
12. Maintain an attitude to foster mutual cooperation. R2= Respect
13. Be direct in dealing with conflict, whatsoever! R2= Respect

A Game

14. Have you understood reality? Or just swayed away by someone influencing you? H= Honesty
15. Make sure information is truthful. H= Honesty
16. Uncover conflict of interest. F= Fairness
17. Acting impartially. F= Fairness
18. Don’t use position for your own gain. F= Fairness
19. Don’t say negative things that could insult others. R2= Respect
20. Negotiate in good faith. R2= Respect

A Game

21. Do not misuse your position for your own gain. R2= Respect
22. Make commitment you can fulfill. R1= Responsibility
23. Do not agree for assignments you are not qualified for. R1= Responsibility
24. Follow copyright law, other laws of the land, and propriety information you are using. R1= Responsibility
25. Report violations. R1= Responsibility

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THE PROJECT RISK MANAGEMENT

WE WISH YOU ALL SUCCESS!

AND HOPE

YOU WILL ACHIEVE HIGHER LANDMARKS!

THE PROJECT RISK MANAGEMENT

THANK YOU!