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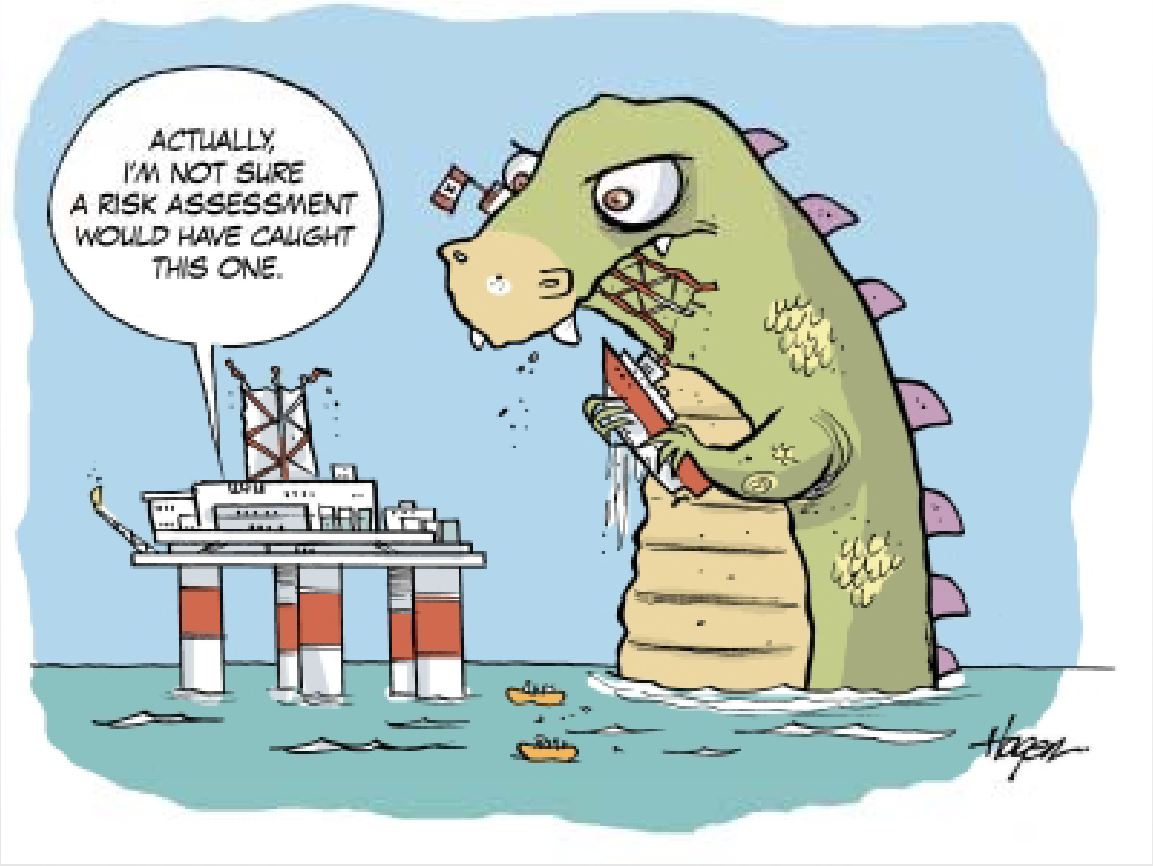

If you don't attack the risks, the risks will attack you

Project Management Institute
Registered Education Provider

Change Consulting & Training is a Project Management Institute (PMI) Registered Education Provider (R.E.P.)

PROJECT MANAGEMENT INSTITUTE
Making project management indispensable for business results.®

Corporate Risk Management and PMI-RMP Exam Preparation

Eyad S. Saadeh

- 26 years of project management experience
- 10 years in organizational management and strategic planning
- 35 Projects (KSA, Bahrain, Qatar, Kuwait, UAE, Oman, Libya, Egypt, Jordan, Syria, Yemen, Cyprus, Iran, Pakistan, and Kyrgyz Republic)
- 6 PMO's setup (building & Implementation)
- 3 Programs (manage and execute)
- 8 Products/ system development projects
- General Manager, partner, and founder of one of a largest technology company operating in Saudi Arabia for 5 years (2001 to 2005)
- Founder and owner of Change Consulting & Training www.change-ppi.com

Eyad S. Saadeh

- **MBA** Executive, University of Wales, UK
- **PMP** (Project Management Professional)
- **PgMP** (Program Management Professional)
- **PMI-RMP** (Risk Management Professional)
- **PMI-ACP** (Agile Certified Practitioner)
- **PMI-SP** (Scheduling Professional)
- **PMOC** (Project Management Office Certificate)
- MS Project Orange, Blue, and **Black** Belts

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Introduce Yourself

- Name
- Organization
- Field
- Project management experience
- Why you are here (expectations)?

The Pain

The Problem

The Solution

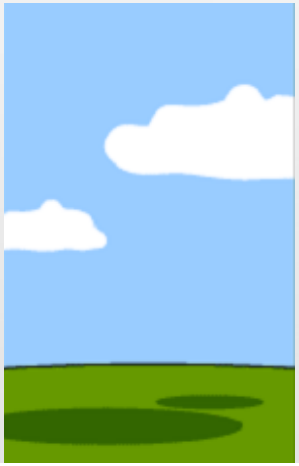
Customer Explanation

Project Manager

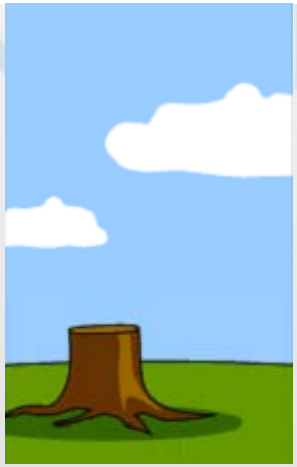
Analyst

Developer

Consultant



Documentation



Support

Installation

Billing

Customer Real Needs!!

Project Fails

- Various public studies (Forrester, Gartner, World Bank, Standish Group) recently reported that between 81% to 84% of all IT project fail.
- 62% to 75% from other non-IT project fail

Failure Examples

- Over half of the reengineering projects have failed.
- Less than one-third of e-business efforts deliver the planned results.
- Many systems projects overrun their budgets and schedules.
- Many engineering and construction projects deliver unplanned problems and fewer benefits than planned

Discussion

- Why projects fail?

Why Projects Fail?

Projects fail mainly because of two reasons:

(1) A failure of estimation and

(2) A failure of implementation

Dr. J. Davidson Frame

Why Projects Fail?

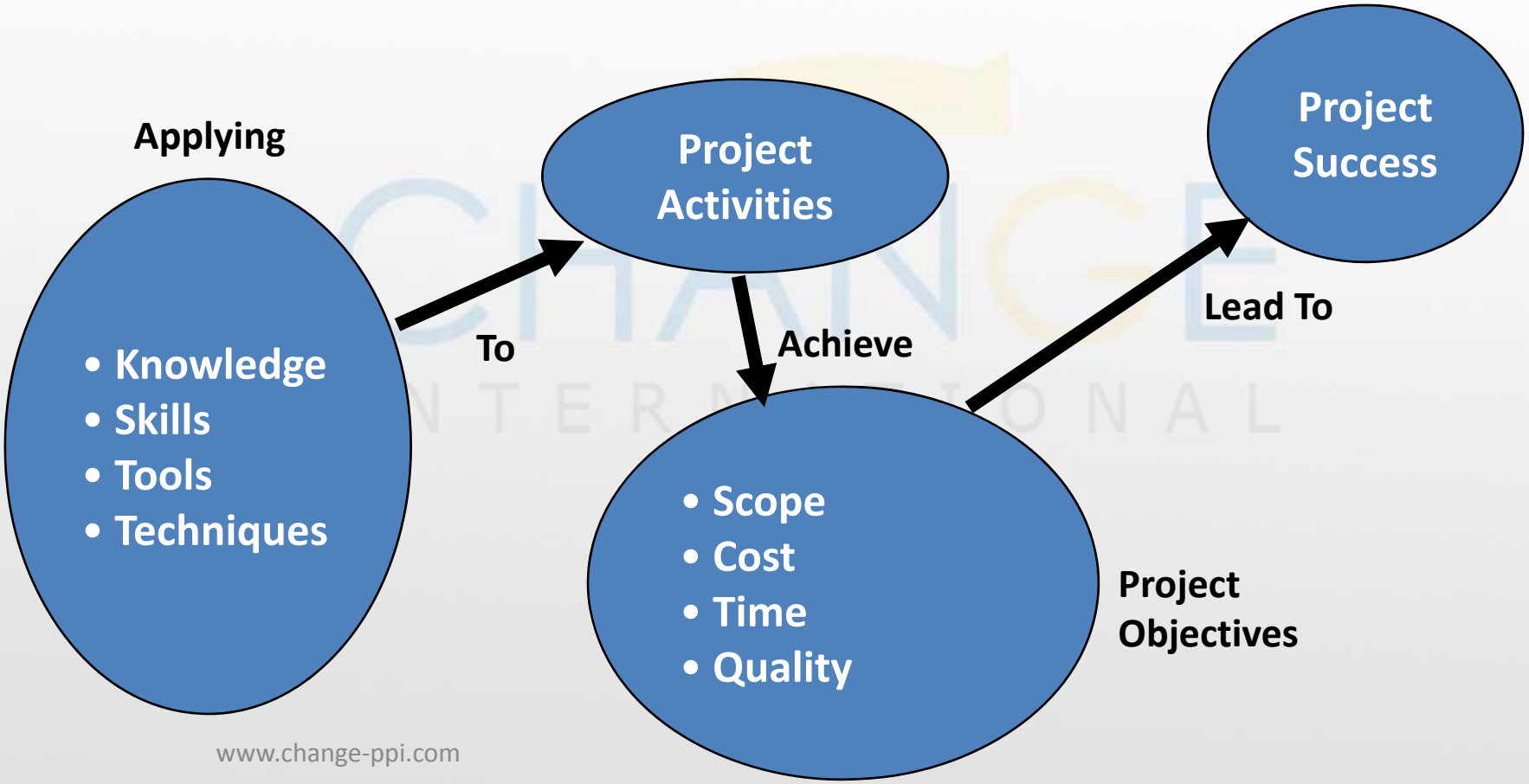
- Is it the management?
- Is it the team?
- Is it the tools?
- Is it the requirements?
- Is it the quality?
- Lack of agreement and communication!!
- Lack of objectives!!
- Lack of resources!!
- Lack of time!!
- Lack of budget!!

It always appears to be everyone else's fault !!

Project Constraints

Trade-Off

Project Management



The Story About

- High quality project will deliver the required (product or service or result) within scope, on time, and within budget.

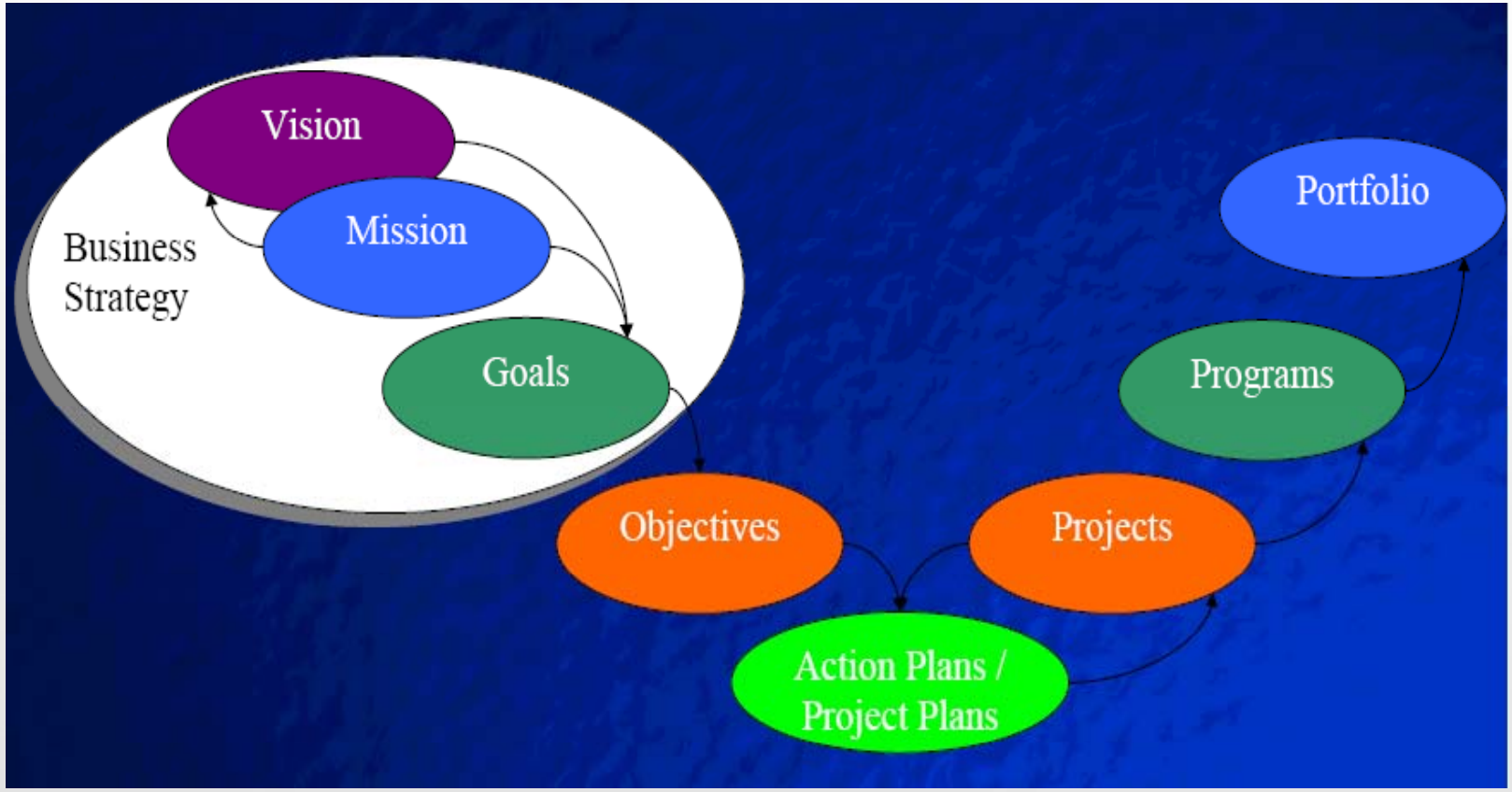
Discussion

- Project & Project management is it new concept?
- When was the 1st project ?

Recommendation

- Stop doing projects to end this headache
- So we will solve the problem!!
- Can we do that?

Big Picture


Vision
Mission
Business Strategy
Goals
Objectives
Action Plans / Project Plans
Projects
Programs
Portfolio

Discussion

- What about your personal vision?
- Are we using projects in our daily life?

NASA

- No project has ever finished on time, within budget, to requirement - yours won't be the first to
- Why?

Projects and Uncertainty

- Projects contain high level of uncertainty
- Explain!!

Course Objectives

1. Getting a solid understanding of risk management concepts and knowledge
2. Be able to mange threats and opportunities effectively and efficiently to deliver successful projects that meet stakeholder expectation
3. Learn how to prepare a comprehensive risk management plan
4. Learn how to develop a practical response strategies for common project risks
5. Learn how to monitor, control, and communicate risks throughout the project life cycle
6. Prepare the participant to pass **PMI-RMP** certificate exam

Course Models

1. Model 01 Introduction
2. Model 02 Risk Planning
3. Model 03 Risk Identification
4. Model 04 Risk analysis
5. Model 05 Risk Response Planning
6. Model 06 Monitor and Control Project Risk
7. Model 07 Recape
8. Model 08 PMI-RMP Exam Preparation

Daily Agenda

Session	From	To
1	08:30 am	10:00 am
Break	10:00 am	10:30 am
2	10:30 am	12:00 pm
Pray Break	12:00 pm	12:30 pm
3	12:30 pm	02:00 pm

Course Materials

- PMI Project Management Body Of knowledge PMBOK
- PMI Practice Standard for Project Risk Management
- Practical Project Risk Management: The ATOM Methodology David Hillson and Peter Simon
- Project Management a Systems Approach to Planning, Scheduling and Controlling Harold Kerzner

Risk Resources

- The Institute of Risk Management www.theirm.org
- Risk Doctor www.risk-doctor.com

Model 01
Introduction

"what can go wrong will go wrong"
Murphy's Law

What is Risk?

- Risk is an uncertain event or condition that, if it occurs, has an effect on at least one project objective
- A risk may have one or more causes and, if it occurs, it may have one or more impacts
- A cause maybe a requirements, assumptions, constraints, or conditions

What is Risk?

- The chance of something happening that will have an impact on objectives.
  - A risk is often specified in terms of an event or circumstance and the consequences that may flow from it.
  - Risk is measured in terms of a combination of the consequences of an event and their likelihood.
  - Risk may have a positive or negative impact.

Project Risk Management

- The processes of conducting risk management planning, identification, analysis, response planning, and monitoring and control on a project

Project Risk Management

- Risk management is the culture, processes and structures that are directed towards the effective management of potential opportunities and adverse effects within the organization environment
- It is an enterprise wide process with multi-dimensions
- It is best achieved by a multidisciplinary team
- Risks must be appropriately communicated and shared

Project Risk Management Objectives

- To increase the probability and impact of positive events, and decrease the probability and impact of negative events in project

Role of Project Risk Management in Project Management

- Project Risk Management is integral to successful project management. Because risk management should be embedded in the planning and operational documents of the project, it is established as part of the project
- Project Risk Management should not be considered as an optional activity

Good Risk Management Practice

- Project Risk Management should always be conducted on an ethical basis.
- Honesty, responsibility, realism, and fair dealing with others

Project Manager's Role for Project Risk Management

- Determining the acceptable levels of risk for the project in consultation with key stakeholders
- Approving the risk management plan
- Promoting the risk management process for the project
- Participating in the risk management process and identifying and owning risks
- Approving risk responses and associated actions prior to implementation

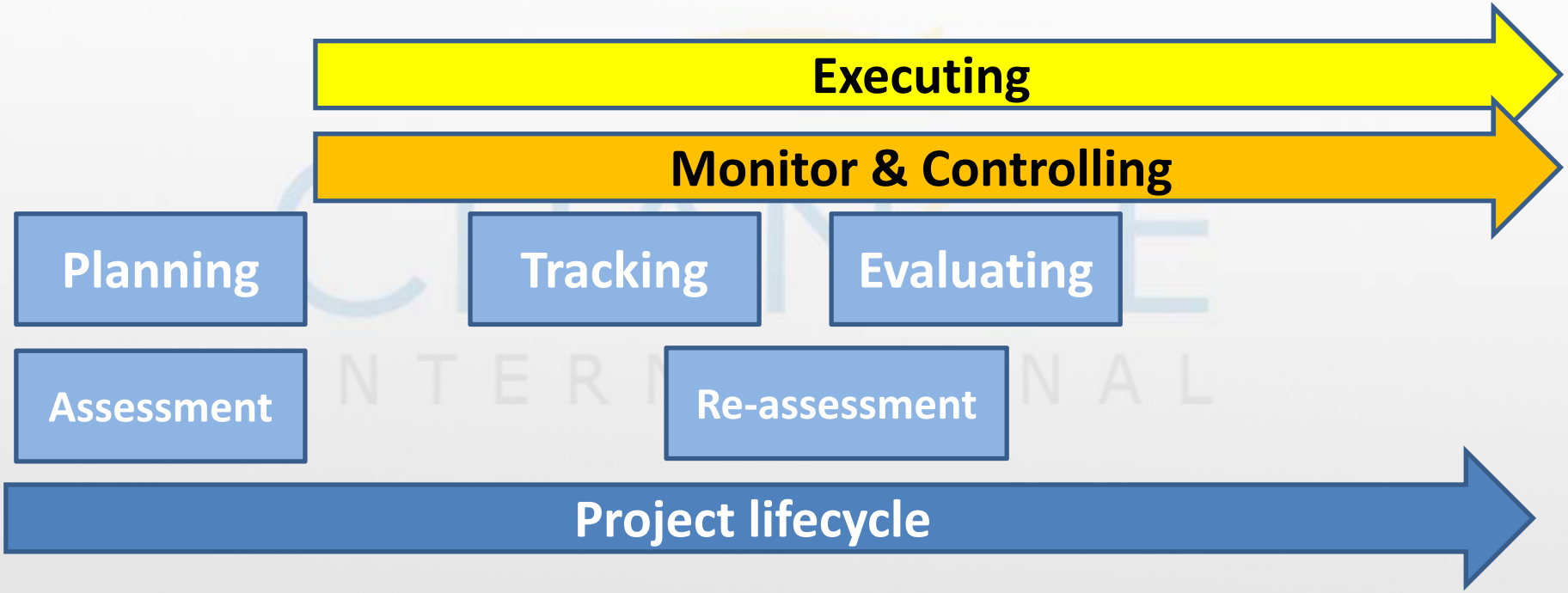
Project Manager's Role for Project Risk Management

- Applying project contingency funds to deal with identified risks that occur during the project
- Overseeing risk management by subcontractors and suppliers
- Regularly reporting risk status to key stakeholders, with recommendations for appropriate strategic decisions and actions to maintain acceptable risk exposure
- Highlighting to senior management any identified risks which are outside the scope or control of the project, or which require input or action from outside the project, or where release of "management reserve" funds might be appropriate
- Monitoring the efficiency and effectiveness of the Project Risk Management process.

Risk Management Process

1. Risk definition process
2. Risk identification process
3. Risk assessment process
4. Risk response identification process
5. Risk monitoring and review process

Risk Management Process



Model 02
Risk Planning

Plan Risk Management

- The process of defining how to conduct risk management activities for a project

Plan Risk Management Objectives

- To develop the overall risk management strategy for the project
- To decide how the risk management processes will be executed
- To integrate Project Risk Management with all other project management activities

Critical Success Factors for the Plan Risk Management Process

- Identify and address barriers to successful project risk management
- Involve project stakeholders
- Comply with the organization's objectives, policies, and practices

Key Areas of Focus for the Plan Risk Management Process

People	Tools	Business
Attitudes	Toolbox	Constraints
Roles, responsibilities, authority	Parameters	Amount of detail and effort
Communications	Definitions	

Choose Your Project

1. Run an annual “global Conference for IT professionals” in Istanbul –Turkey
2. Build and operate China Town in your city
3. Building the Ministry of Interior portal (e-government project)
4. Establish and operate high class coffee shop
5. Establish and operate healthy food restaurant at XYZ Mall
6. Or your own project

Congratulation

You are now assigned as a Project Risk Manager

Workshop

- Introduce your project

Risk Management Plan

- Describes how risk management will be structured and performed on the project
- Contained in or is a subsidiary plan of the project management plan

Risk Management Plan

- Methodology
- Roles and responsibilities
- Budgeting
- Timing
- Risk Categories, RBS
- Definition of Risk Probability and Impact
- Probability and impact matrix (PI matrix)
- Revised Stakeholders tolerances
- Reporting Formats
- Tracking

Definition of Risk Probability and Impact (Probability)

Title	Score	Description
Very Low	20	Highly unlikely to occur; however, still needs to be monitored as certain circumstances could result in this risk becoming more likely to occur during the project
Low	40	Unlikely to occur, based on current information, as the circumstances likely to trigger the risk are also unlikely to occur
Medium	60	Likely to occur as it is clear that the risk will probably eventuate
High	80	Very likely to occur, based on the circumstances of the project
Very High	90	Highly likely to occur as the circumstances which will cause this risk to eventuate are also very likely to be created

Definition of Risk Probability and Impact (Impact)

Title	Score	Description
Very Low	20	Insignificant impact on the project. It is not possible to measure the impact on the project as it is minimal
Low	40	Minor impact on the project, e.g. < 5% deviation in scope, scheduled end-date or project budget
Medium	60	Measurable impact on the project, e.g. 5-10% deviation in scope, scheduled end-date or project budget
High	80	Significant impact on the project, e.g. 10-25% deviation in scope, scheduled end-date or project budget
Very High	90	Major impact on the project, e.g. >25%% deviation in scope, scheduled end-date or project budget

Probability and impact matrix (PI matrix)

ID	Likelihood	Impact	Priority Score	Rating
1.1	20	80	50	Medium
1.2	80	60	70	High
1.3	90	40	70	High
2.1	40	20	30	Low
2.2	80	90	80	Very High
2.3	20	80	50	Medium

Defined Conditions for Impact Scale of a Risk on Major Project Objectives

Project Objective	Very Low .05	Low .1	Moderate .2	High .4	Very High .8
Cost	Insignificant Cost Increase	<5% Cost Increase	5–10% Cost Increase	10–20% Cost Increase	>20% Cost Increase
Schedule	Insignificant Schedule Slippage	Schedule Slippage <5%	Overall Project Slippage 5–10%	Overall Project Slippage 10–20%	Overall Project Schedule Slips >20%
Scope	Scope Decrease Barely Noticeable	Minor Areas of Scope Are Affected	Major Areas of Scope Are Affected	Scope Reduction Unacceptable to the Client	Project End Item Is Effectively Useless
Quality	Quality Degradation Barely Noticeable	Only Very Demanding Applications Are Affected	Quality Reduction Requires Client Approval	Quality Reduction Unacceptable to the Client	Project End Item Is Effectively Unusable

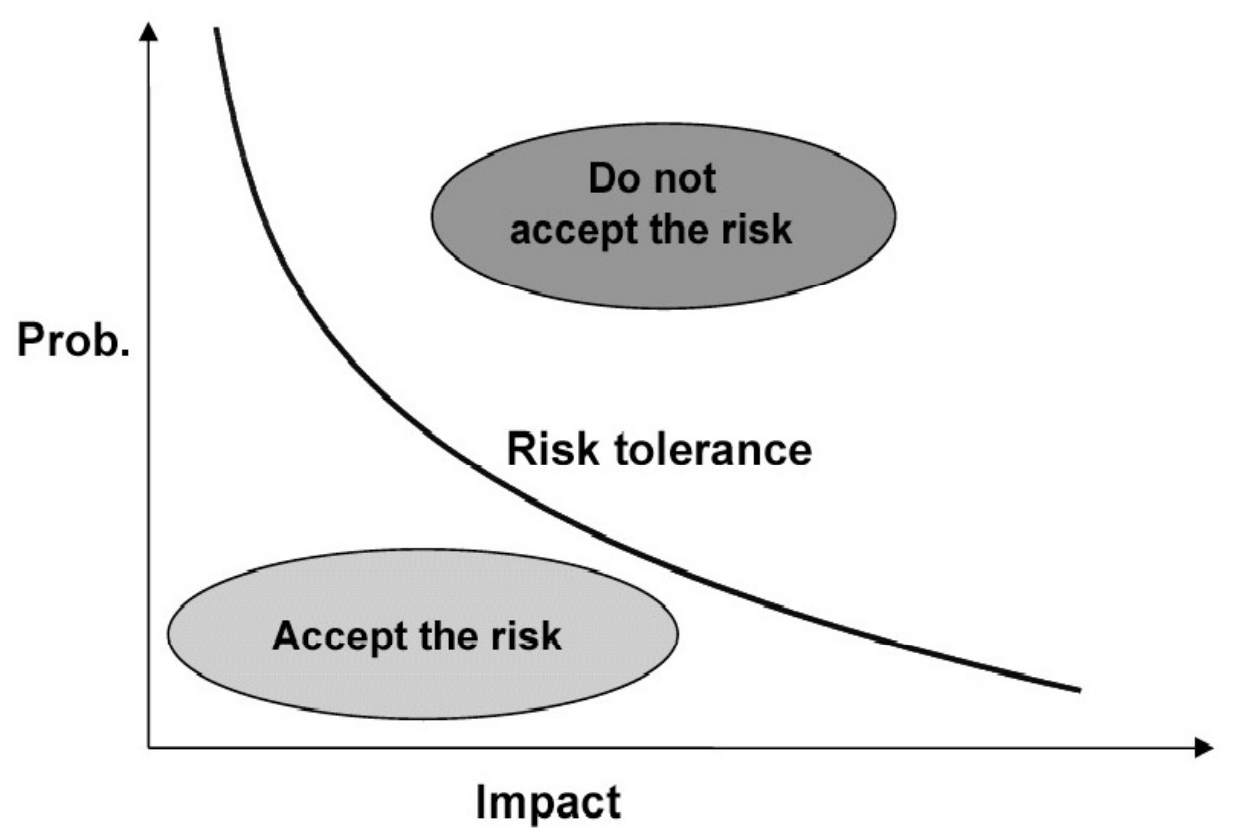
Uncertainty

- A lake of knowledge about an event that reduces confidence in conclusions drawn from the data
- Absence of information, knowledge, or understanding regarding the outcome of an action, decision, or event

Risk Tolerance

- The degree, amount or volume of risk that an organization or individual will accept
- Areas of risks that are acceptable or unacceptable (a risk that affects our reputation will not be tolerated)
- Project constraints and any intangibles can be within tolerance area
- People and organizations have differing risk tolerances

Risk Tolerance



Risk Threshold

- A cost, time, quality, technical or resource value used as parameter, and which may be included in product specification
- Crossing the threshold should trigger some actions
- The amount of risk that is acceptable (a risk of two weeks delay is ok, but nothing more)

Risk Averse

- Somebody who don't want to take a risk

Risk Category

- Business, technical, or operational
- Acceptable or unacceptable
- Short or long term
- Risks are viewed as either manageable or unmanageable
- Risks are either internal or external

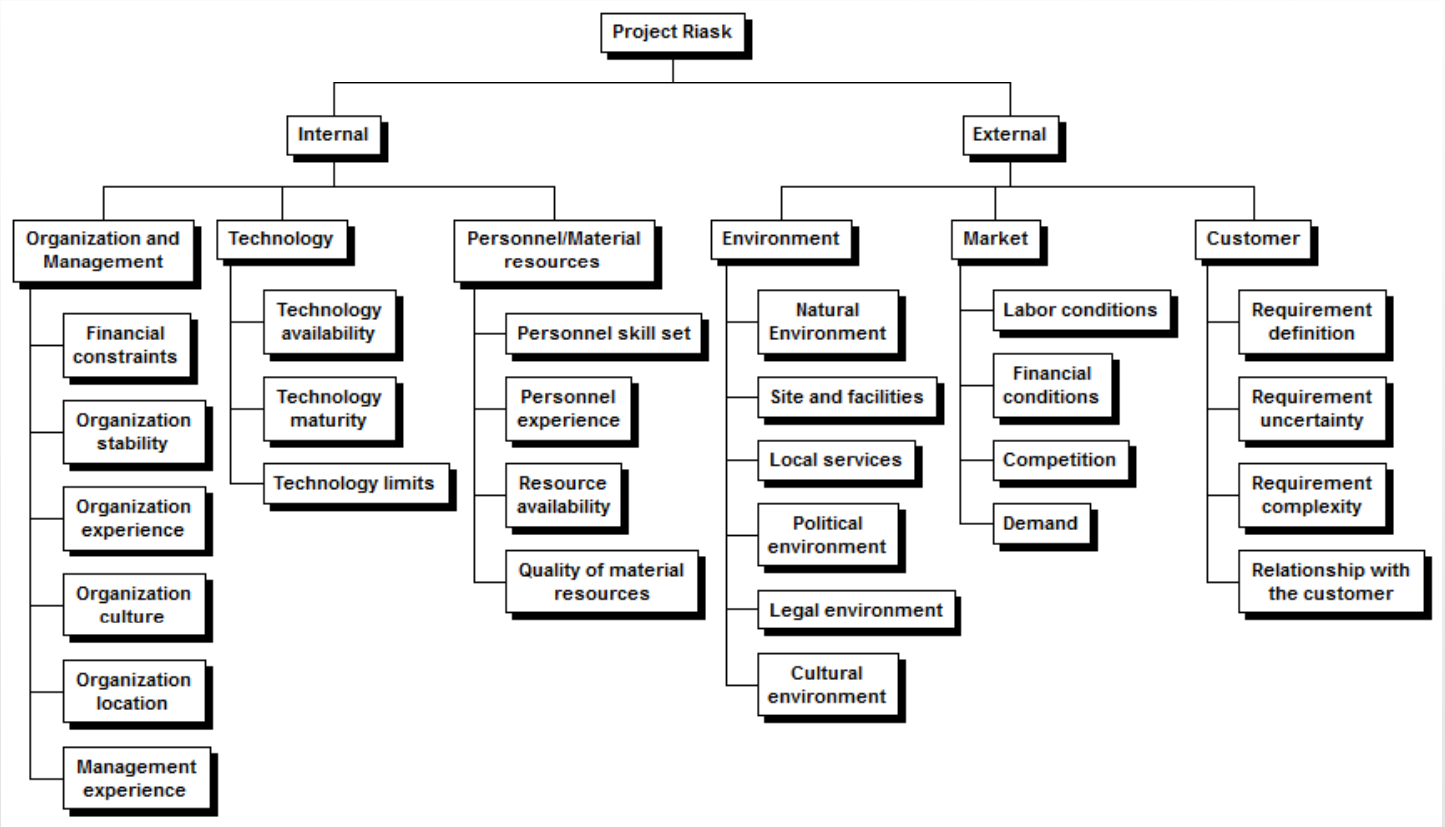
Risk Category

- Requirements
- Benefits
- Schedule
- Budget
- Deliverable
- Scope
- Issues
- Supplier
- Acceptance
- Communication
- Resource

Risk Categories

- Human (qualification, absence, resignation, etc)
- Technical (complex, virus, hackers, obsolete, failure, etc)
- Project-management (poor estimation, poor WBS, etc)
- Organizational (lake of vision, unclear project prioritization, management support, changing sponsor priorities)
- Operational (delivery dates, approvals, access to clients, etc)
- Government & Political (change regulation, new laws, change ministry, tax, public opinion, government policy, etc)
- Financial (business failure, stock market, interest rates, etc)
- Natural (weather, natural disaster, accident, disease, etc)

Risk Breakdown Structure RBS



Explore

- Risk Management Plan and Process templates
- KACST risk management plan

Workshop

- Build your risk categories template

Workshop

- Explore the S/W tool

Case Study

- 01 Lessons in Risk Management

Model 03
Risk Identification

Identify Risks

- The process of determining which risks may affect the project and documenting their characteristics

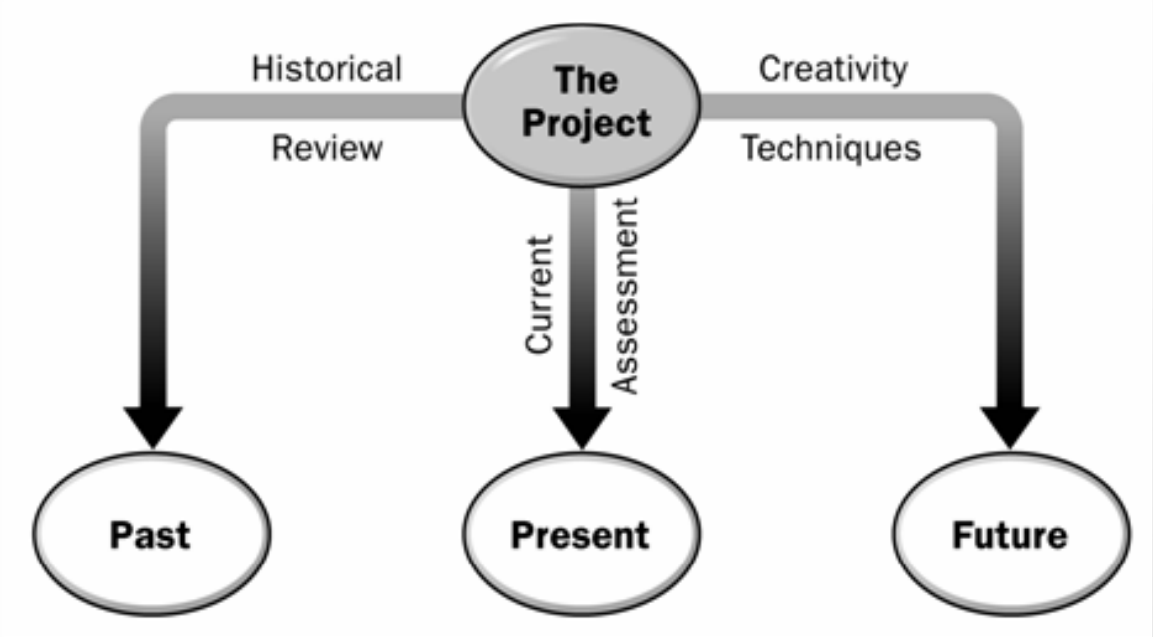
Critical Success Factors for the Identify Risks Process

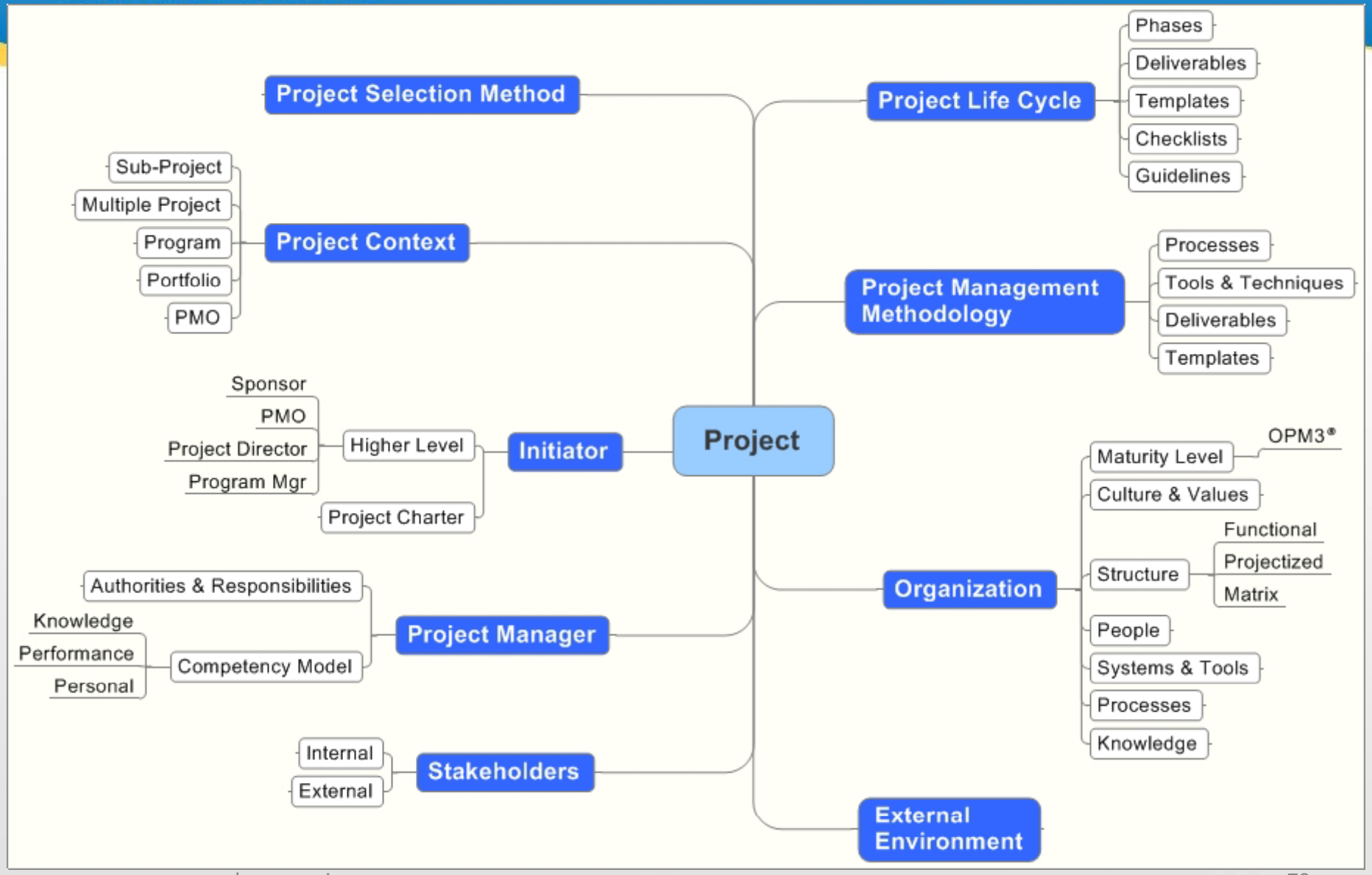
- Early identification
- Iterative identification
- Emergent identification
- Comprehensive risk identification
- Explicit identification of opportunities
- Multiple perspectives
- Risks linked to project objectives
- Complete risk statement
- Ownership and level of detail
- Objectivity (sources of bias should be exposed wherever possible)

Risk Identification

- The first thing we must do in risk identification is recognize the areas of the project where the risks can occur.
  - Scope (scope statement and WBS)
  - Time (duration estimation , Network diagram, and schedule)
  - Cost (cost estimation)
  - Estimation should be accurate and reliable

Three Perspectives of Risk Identification

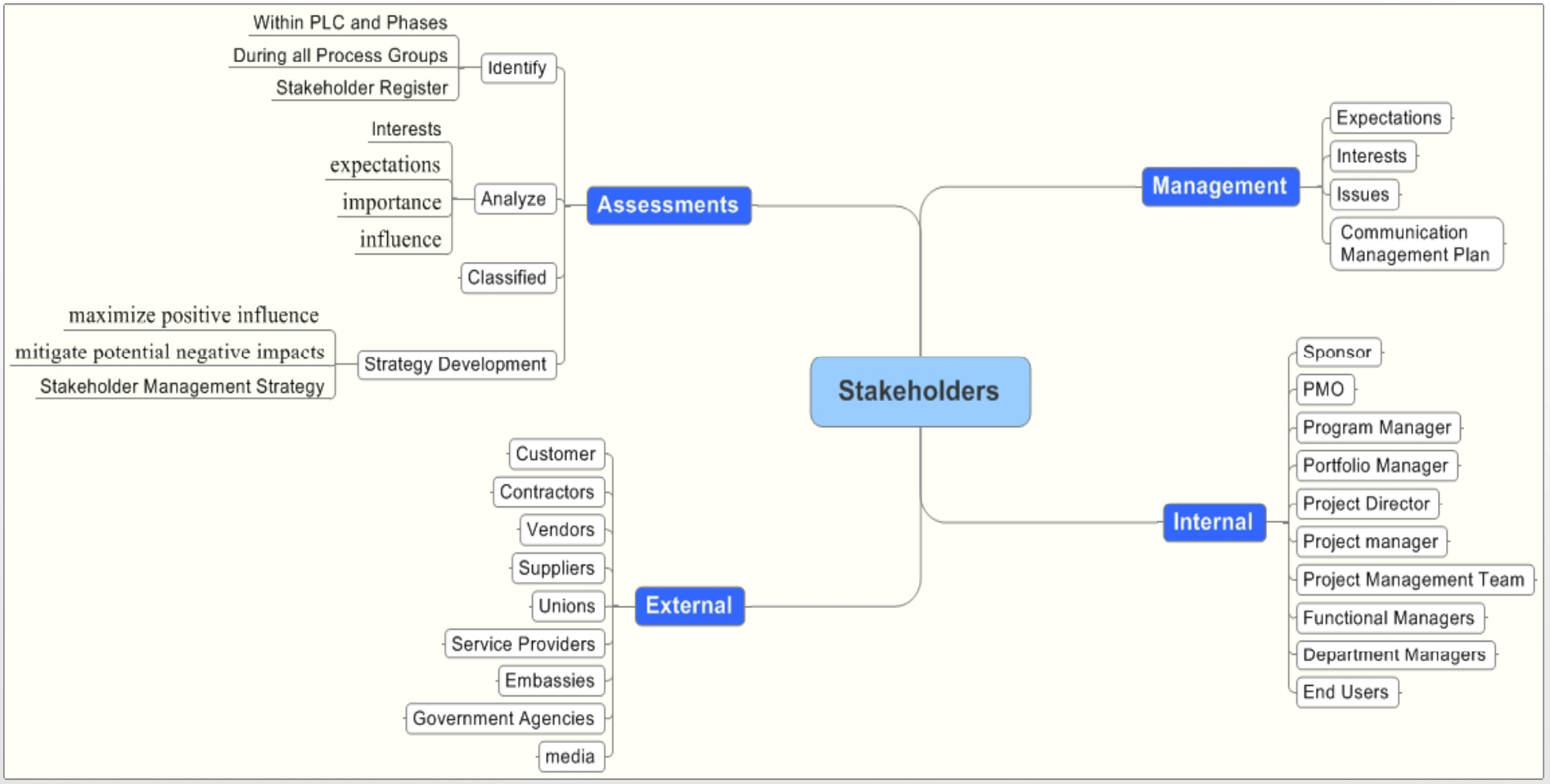



Project
Project Selection Method
Project Life Cycle
Phases
Deliverables
Templates
Checklists
Guidelines
Project Context
Sub-Project
Multiple Project
Program
Portfolio
PMO
Project Management Methodology
Processes
Tools & Techniques
Deliverables
Templates
Initiator
Higher Level
Sponsor
PMO
Project Director
Program Mgr
Project Charter
Organization
Maturity Level
OPM3®
Culture & Values
Structure
Functional
Projectized
Matrix
People
Systems & Tools
Processes
Knowledge
Project Manager
Authorities & Responsibilities
Competency Model
Knowledge
Performance
Personal
Stakeholders
Internal
External
External Environment

Project Stakeholder

- Stakeholder - Person or organization that is actively involved in the project or whose interests may be positively or negatively affected by execution or completion of the project. A stakeholder may also exert influence over the project and its deliverable

These 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.


Stakeholders
Assessments
Identify
Within PLC and Phases
During all Process Groups
Stakeholder Register
Analyze
Interests
expectations
importance
influence
Classified
Strategy Development
maximize positive influence
mitigate potential negative impacts
Stakeholder Management Strategy
Management
Expectations
Interests
Issues
Communication Management Plan
Internal
Sponsor
PMO
Program Manager
Portfolio Manager
Project Director
Project manager
Project Management Team
Functional Managers
Department Managers
End Users
External
Customer
Contractors
Vendors
Suppliers
Unions
Service Providers
Embassies
Government Agencies
media

Stakeholder's Influences

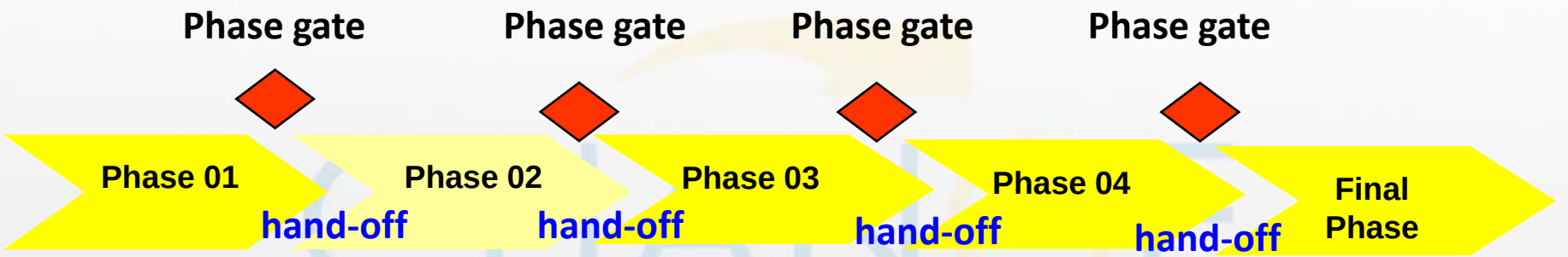
- Key stakeholders can make or break the success of a project
- Even if all the deliverables are met and the objectives are satisfied, if your key stakeholders aren't happy, nobody's happy
- They can make life wonderful or inordinately challenging
- The definition of a successful project is one that accomplishes the goals of the project and meets or exceeds stakeholders' expectations

Organization and Project Management

- Strategy (vision, mission, strategic objectives)
- Structure and culture
- People
- Process (business, project management)
- Governance
- Level of maturity
- Documentation
- Tools
- Stakeholders
- Services and products

Organizational Project Management Maturity Model OPM3

Project Lifecycle



Number of phases related to project parameter (type, nature, size, and complexity)

Basic Framework to Manage the Project

Scoping

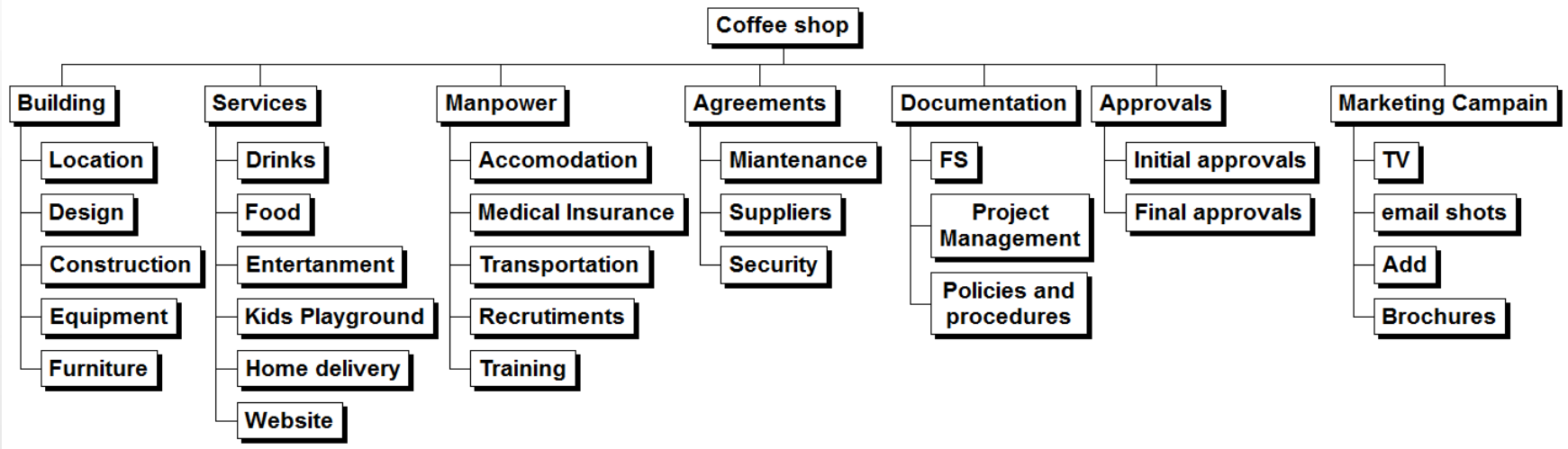
- Lack of requirements management is one of the biggest reasons why 60% of project defects are due to requirements, and almost half of the project budget is spent reworking requirements defects

Software Engineering Institute

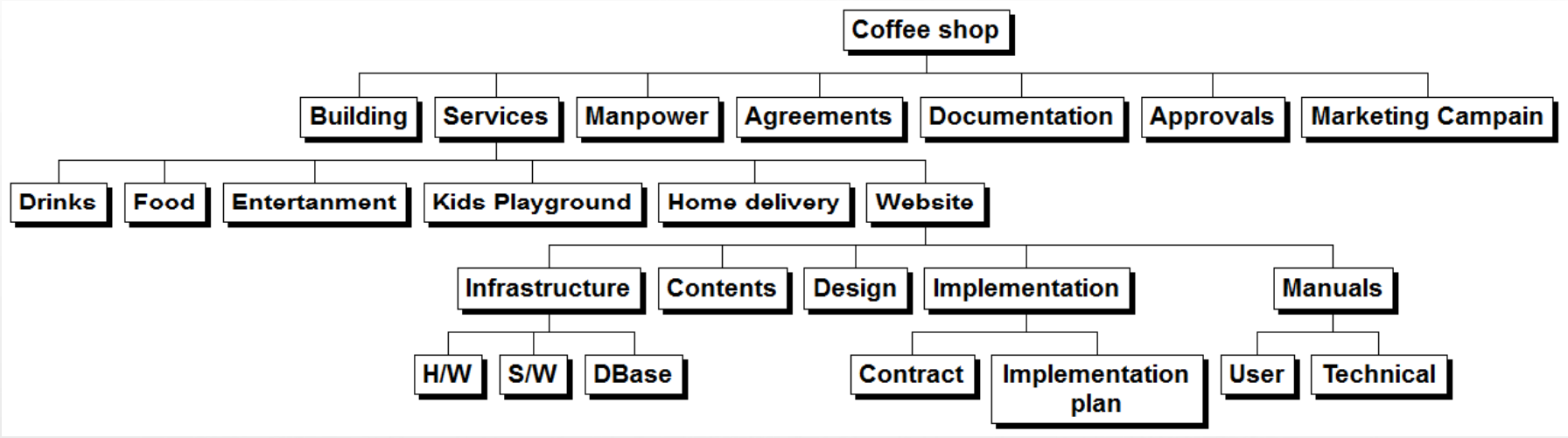
WBS

- Deliverable-oriented hierarchical decomposition
- Work packages (lowest level) can be scheduled, cost estimated, monitored, and controlled
- Powerful communications and collaboration tool

WBS


Coffee shop
Building
Location
Design
Construction
Equipment
Furniture
Services
Drinks
Food
Entertanment
Kids Playground
Home delivery
Website
Manpower
Accomodation
Medical Insurance
Transportation
Recrutiments
Training
Agreements
Miantenance
Suppliers
Security
Documentation
FS
Project Management
Policies and procedures
Approvals
Initial approvals
Final approvals
Marketing Campain
TV
email shots
Add
Brochures

WBS


Coffee shop
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Approvals
Marketing Campain
Drinks
Food
Entertanment
Kids Playground
Home delivery
Website
Infrastructure
Contents
Design
Implementation
Manuals
H/W
S/W
DBase
Contract
Implementation plan
User
Technical

RISK REGISTER

Identify Risks Tools and Techniques

1. Documentation reviews (quality, consistency)
2. Information gathering techniques
3. Checklist analysis
4. Assumptions analysis
5. Diagramming techniques
6. SWOT analysis
7. Expert judgment

Risk Exposure

- Team size
- Project history (Newer projects are riskier because the processes have not been refined)
- Staff expertise and experience
- Project complexity
- Management stability (unity of direction)
- Time compression
- Resource availability

Typical Sources of Project Risk

- Staff:
  - Key staff will not be available when needed
  - Key skill sets will not be available when needed
  - Key staff will be lost during the project
  - Subcontractors will under perform and fail to meet their assignments
- Equipment:
  - Required hardware will not be delivered on time
  - Access to the development environment will be restricted
  - Equipment will fail

Typical Sources of Project Risk

- Customer
  - Customer resources will not be made available as required
  - Customer staff will not reach decisions in a timely manner
  - Deliverables will not be reviewed according to the schedule
  - Knowledgeable customer staff will be replaced with those less qualified
  - A lack of project experience with this customer will result in delays or undermine the relationship.
  - Conflict within the customer organization about the desirability or feasibility of the project will threaten it
  - A lack of clear lines of responsibility and escalation will interfere with problem resolution
  - Benefits have not been quantified
  - Customer expectations for the application exceed the capabilities of technology

Typical Sources of Project Risk

- Scope
  - A lack of clarity in the scope definition will result in numerous scope changes.
  - A lack of clarity in the scope definition will result in conflict in the customer about the scope
  - Scope changes will be introduced without the knowledge of project management
  - A lack of clearly defined acceptance criteria will cause delays in acceptance and sign-off.
  - A hurried estimate or one that has not been validated will result in a project plan that will not be met

Typical Sources of Project Risk

- Technology
  - The technology will have technical or performance limitations that endanger the project
  - Technology components will not be easily integrated
  - The technology is unproved and will fail to meet customer and project requirements
  - The technology is new and poorly understood by the project team and will introduce delays

Typical Sources of Project Risk

- System:
  - System response time will not be adequate
  - System capacity requirements will exceed available capacity
  - The system will fail to meet functional requirements.
- Physical:
  - The office will be damaged by fire, flood, or other catastrophe.
  - A computer virus will infect the development environment or operational system
  - The team is not co-located, which will impede communication and introduce errors
  - A team member will steal confidential project material and make it available to competitors of the customer
- Management Risk:
  - The relative inexperience of the project manager will result in budget or schedule slippages
  - Management will deem this project to have a lower priority for resources and attention

Information Gathering Techniques

- Brainstorming
- Delphi technique
- Interviewing
- Root cause analysis

Brainstorming

- Popular tool that helps you generate a comprehensive list of project risks
- Help you to get buy in from stakeholders
- Provides a freewheeling environment in which everyone is encouraged to participate
- Quirky ideas are welcomed, all participants are asked to contribute fully and fairly
- During brainstorming sessions there should be no criticism of ideas

Delphi Technique

- A way to reach a consensus of experts
- Experts participate anonymously
- Help reduce bias
- The anonymity and remoteness of the process helps to avoid issues of groupthink and personality conflict
- It gives people time to think issues through properly, critique arguments rigorously and contribute fully

Groupthink Phenomenon

- You decide to speak in a meeting and then decided against it because you did not want to appear unsupportive of the group's efforts
- Led a team in which the team members were reluctant to express their own opinions
- When the desire for group consensus overrides people's common sense desire to present alternatives, critique a position, or express an unpopular opinion

Groupthink

- Groupthink happens when there is:
  - A strong, persuasive group leader
  - A high level of group cohesion
  - Intense pressure from the outside to make a good decision

Root Cause Analysis

- The Importance of the big picture
- Figure out what negative events are occurring. Then, look at the complex systems around those problems, and identify key points of failure. Finally, determine solutions to address those key points, or root causes

Root Cause Analysis

- Appreciation
- 5 Whys
- Drill Down
- Cause and Effect Diagrams

Appreciation

- Simple but powerful technique for extracting the maximum amount of information possible from a simple fact or statement
- Ask the question "So what?“ until you explore all possible conclusions from it

Appreciation Example

- You've just found out that your department's budget is going to be cut by 25 percent next year. This is a huge cut, and you want to make sure that you've uncovered all the implications before you start to brainstorm possible solutions

Appreciation Example

- Statement: Our department's budget is going to be cut 25 percent starting January 1.
- So what?
- So the only way to accommodate that cut is to reduce our spending dramatically
- So what?
- So we're probably going to have to cut staff, and we'll definitely have to cut spending on supplies, research, and staff parties
- So what?
- So staff morale is probably going to drop, especially if I have to lay off members of our team
- So what?
- So I'll need to come up with plenty of low-cost ways to boost morale without spending money
- So what?
- So I'll need to start thinking about this tomorrow, since the new budget will go into effect in two months, and I want to be able to manage the consequences when I let the team know

5 Whys?

Workshop

- Your client, Hinson Corp., is unhappy?
- Do the root cause analysis using 5 whys

Drill Down

- Breaking complex problems down into progressively smaller parts

Drill Down

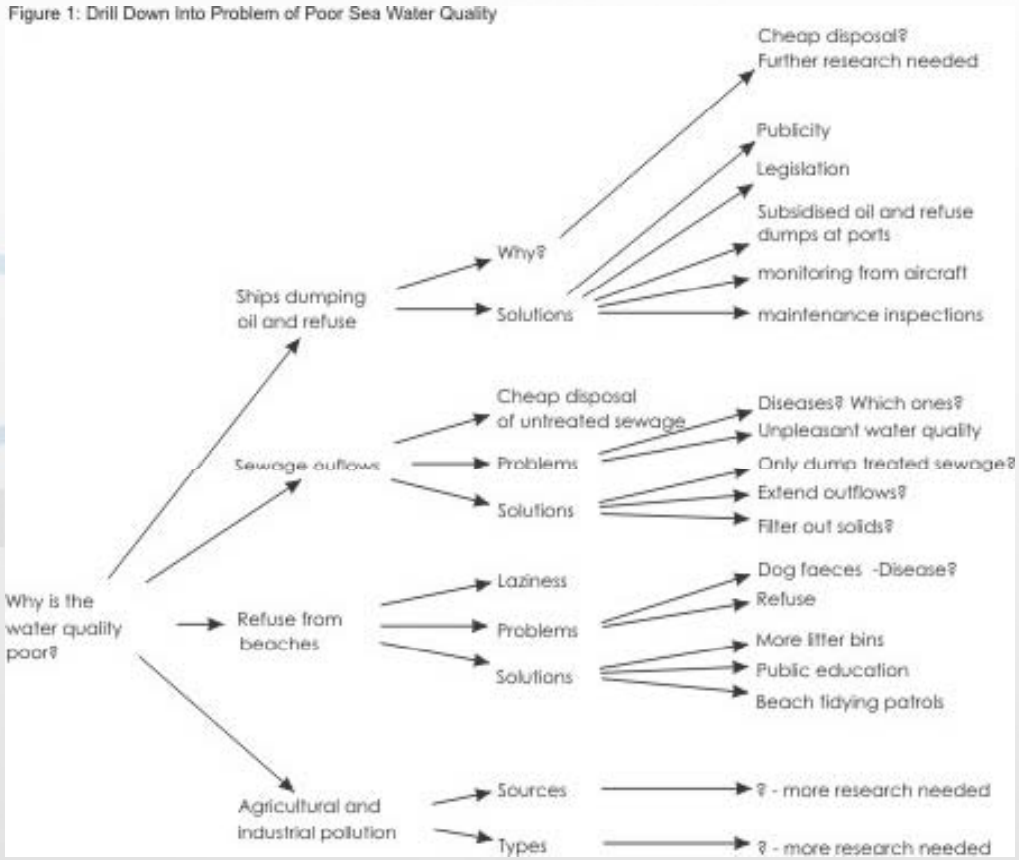
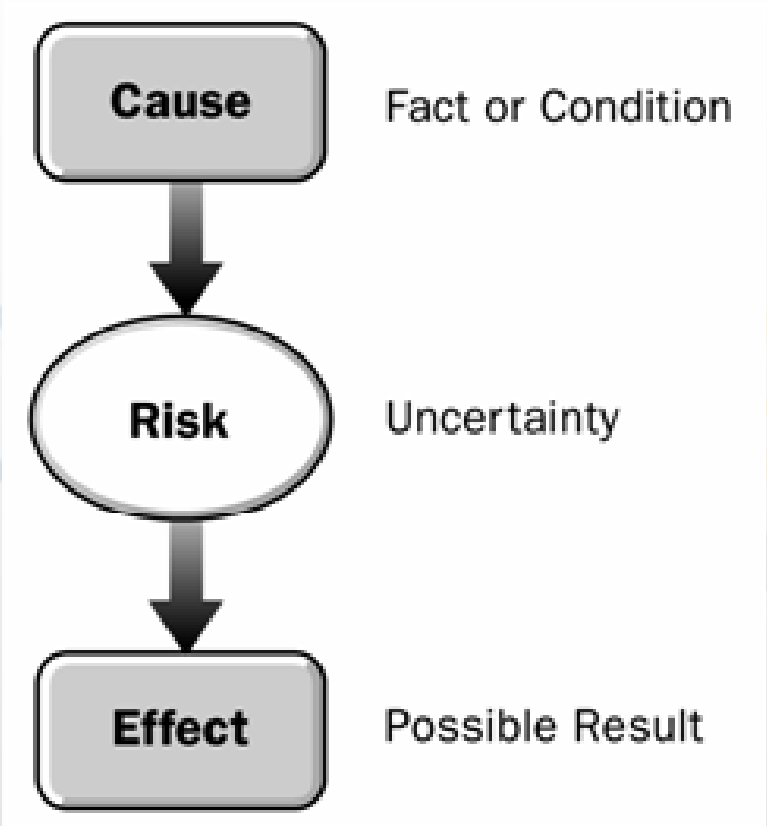
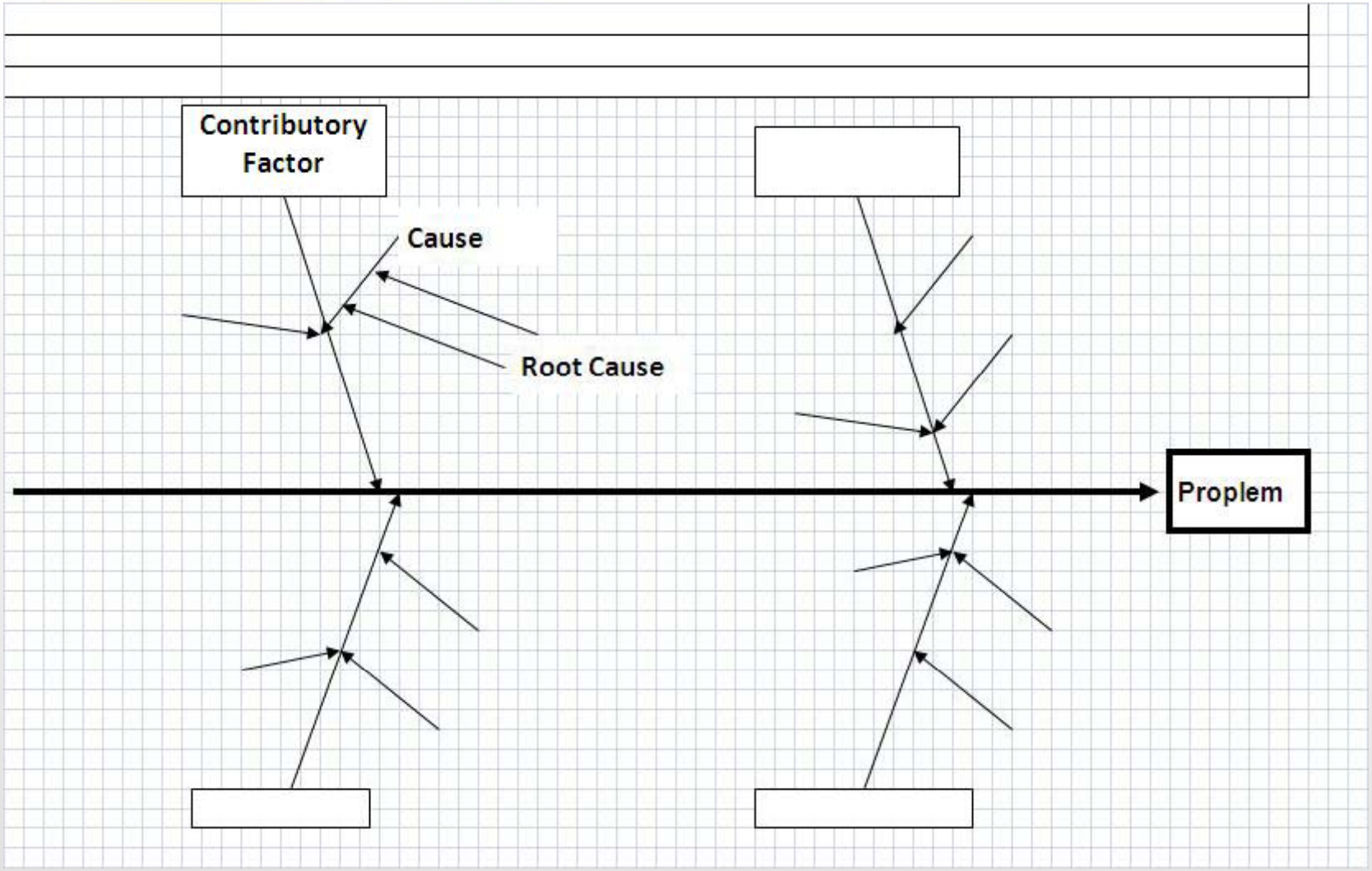


Figure 1: Drill Down Into Problem of Poor Sea Water Quality
Why is the water quality poor?
Ships dumping oil and refuse
Why?
Solutions
Cheap disposal?
Further research needed
Publicity
Legislation
Subsidised oil and refuse dumps at ports
monitoring from aircraft
maintenance inspections
Sewage outflows
Cheap disposal of untreated sewage
Problems
Solutions
Diseases? Which ones?
Unpleasant water quality
Only dump treated sewage?
Extend outflows?
Filter out solids?
Refuse from beaches
Laziness
Problems
Solutions
Dog faeces -Disease?
Refuse
More litter bins
Public education
Beach tidying patrols
Agricultural and industrial pollution
Sources
Types
? - more research needed
? - more research needed

Cause and Effect Diagram

- Define the problem
- Identify the main contributing factors
- Identify the causes within each of these factors
- Drill down to isolate the root causes
- Analyze the problem in detail
- Identify possible solutions


Cause
Fact or Condition
Risk
Uncertainty
Effect
Possible Result


Contributory Factor
Cause
Root Cause
Proplem

Cause and Effect Diagram

- Main Contributory Factor
  - People
  - Process
  - Organization
  - Environment
  - Equipment
  - Measurement

Workshop

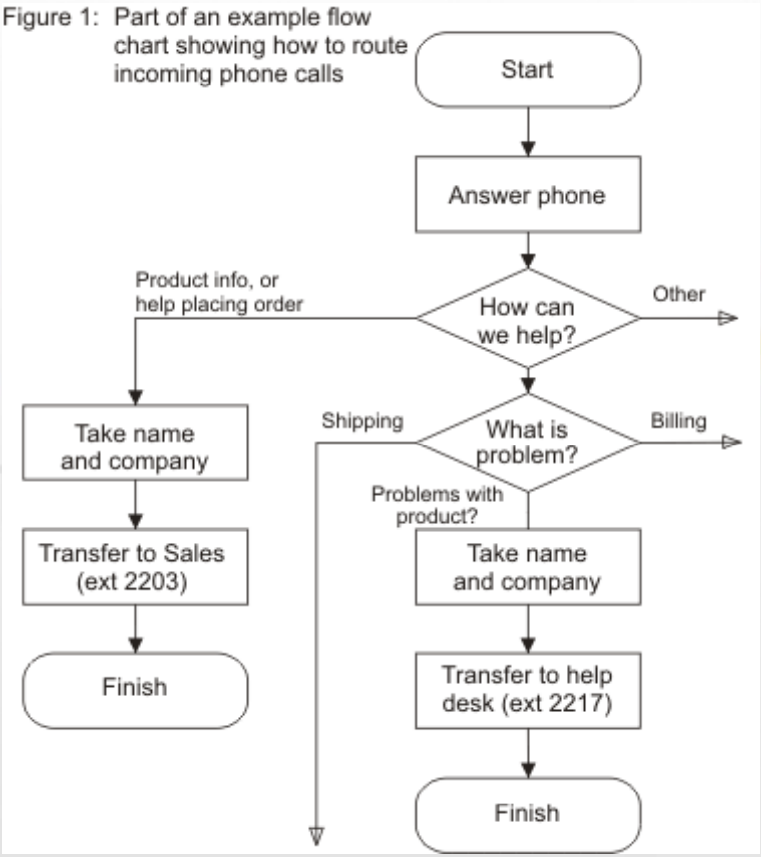
- Using cause and effect diagram Help S & P Office Machines to find the root cause of their problem

Diagramming Techniques

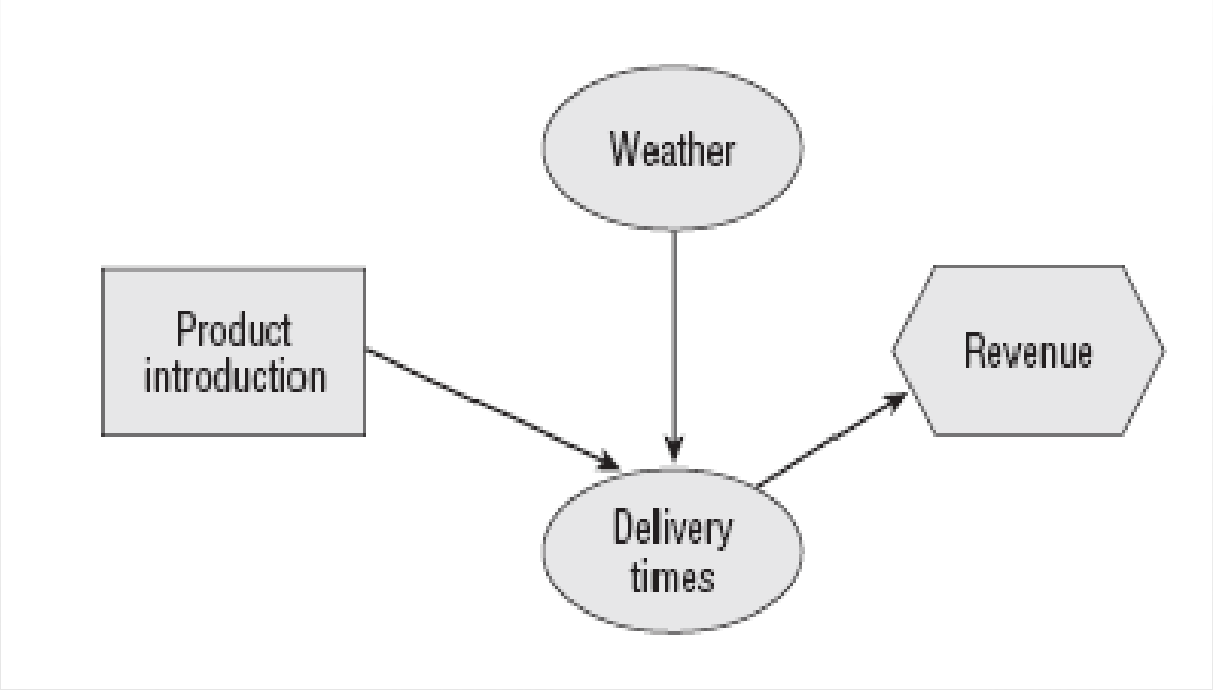
- Cause and effect diagrams
- System or process flow charts
- Influence diagrams

System or Process Flow Charts

Figure 1: Part of an example flow chart showing how to route incoming phone calls



Influence Diagrams



Influence Diagrams

- Eat,
- Gain weight
- Self esteem

SWOT Analysis

Strengths: What do you do well? What unique resources can you draw on? What do others see as your strengths?	**Weaknesses:** What could you improve? Where do you have fewer resources than others? What are others likely to see as weaknesses?
Opportunities: What good opportunities are open to you? What trends could you take advantage of? How can you turn your strengths into opportunities?	**Threats:** What trends could harm you? What is your competition doing? What threats do your weaknesses expose you to?

Workshop

- SWOT analysis for “The Sweet Dreams Motel”

Checklist Analysis

- Explore “Risk Assessment Questionnaire”

Risk Register

- Ultimately contains the outcomes of the other risk management processes
- List of identified risks
- List of potential responses

Risk	Probability	Impact	Priority	Response Strategy
Lake of sponsorship				
Unclear Project Dependencies				
Unclear Alignment of vendor objectives with Program Objectives				

Risk Meta Language

- Distinguishing the risk from its cause (s) and effect (s)
- Describing each risk using three-part statements in the form:

"As a result of (cause) , an (uncertain event) may occur, which would lead to (effect on project objectives)"

Risk Meta Language

- As a result of *lose connection*, a *fire* may occur, which would lead to a *loss of 10,000$*
- As a result of *not being able to control the availability of our project resources, we may have to develop the critical data interfaces with less experienced staff*, which would *affect our ability to deliver the complete interface solution for the project*

Workshop

- Identify your project risks

Workshop

- Using the S/W tool List your project risk

Model 04
Risk Analysis

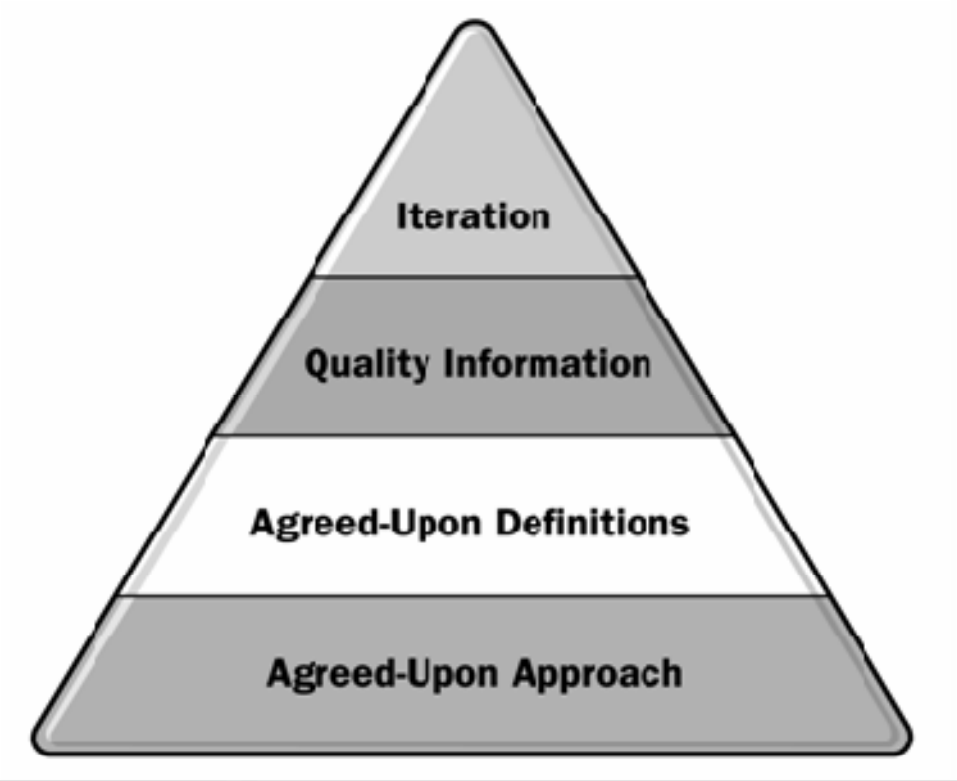
What is Risk Analysis

- The process which answers the following questions:
  - What can happen?
  - What is the likelihood of occurrence?
  - What are the consequences?
  - How certain is this knowledge?
  - Risks are inherently uncertain
  - Risks tend to differ for individuals or areas
  - Use qualitative or quantitative models to characterize the information

Risk Analysis

- Can be performed qualitatively or quantitatively
- Qualitative risk analysis generally involves assessing a situation by instinct or “gut feel,” and is characterized by statements like, “That seems too risky” or “We’ll probably get a good return on this”
- Quantitative risk analysis attempts to assign numeric values to risks, either by using empirical data or by quantifying qualitative assessments

Building Risk Analysis Credibility



QUALITATIVE RISK ANALYSIS

Qualitative Risk Analysis

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

Qualitative Risk Analysis

- Subjective analysis of the risks identified in identify risks
- A rapid and cost-effective means of establishing priorities for plan risk responses
- Lays the foundation for perform quantitative risk analysis if required
- Qualitative risk analysis should be revisited during the project's life cycle
- Reflect the organization's sensitivity to particular impacts or the organization's desire to avoid high-impact threats or exploit high-impact opportunities

Critical Success Factors for the Perform Qualitative Risk Analysis Process

- Collect high-quality information about risks
- Use an agreed-upon approach
- Use agreed-upon definitions of risk terms
- Perform Iterative qualitative risk analysis


Select Risk Characteristics
Collect and Analyze Data
Prioritize Risks
Categorize Risk Causes
Document

Qualitative Risk Analysis Tools and Techniques

1. Risk probability and impact assessment
2. Probability and impact matrix
3. Risk data quality assessment
4. Risk categorization
5. Risk urgency assessment
6. Expert judgment

Probability and Impact Assessment

- A qualitative risk assessment requires accurate and unbiased data if it is to be credible
- Accuracy, quality, reliability, and integrity of the data about the risk

Probability and Impact Matrix

Risk Score for a Specific Risk					
Probability %					
90					
70					
50					
30					
10					
	5	10	20	40	80
	Impact on Objective %				

Probability and Impact Matrix

Impact

Probability	Extreme	Very high	Moderate	Low	Negligible
Almost certain	Severe	Severe	High	Major	Moderate
Likely	Severe	High	Major	Significant	Moderate
Moderate	High	Major	Significant	Moderate	Low
Unlikely	Major	Significant	Moderate	Low	Very low
Rare	Significant	Moderate	Low	Very low	Very Low

Risk Data Quality Assessment

- A qualitative risk assessment requires accurate and unbiased data if it is to be credible
- Accuracy, quality, reliability, and integrity of the data about the risk

Risk Urgency Assessment

- Risks requiring near-term responses
- Indicators of urgency can include time to affect a risk response, symptoms and warning signs, and the risk rating
- Risk severity rating

Risk Register Updates

- Relative ranking or priority list of project risks
- Risks grouped by categories
- Causes of risk or project areas requiring particular attention
- List of risks requiring response in the near-term
- List of risks for additional analysis and response
- Watchlists of low-priority risks
- Trends in qualitative risk analysis results

Risk	Probability	Impact	Priority	Response Strategy
Lake of sponsorship	10%	80%		
Unclear Project Dependencies	30%	80%		
Unclear Alignment of vendor objectives with Program Objectives	50%	80%		

Workshop

- Analyze your risks using PI Matrix

Workshop

- Using the S/W tool
- Perform qualitative risk analysis

QUANTITATIVE RISK ANALYSIS

Quantitative Risk Analysis

- Quantitative Risk Analysis gives the project manager ability to see how project schedule will be affected if certain risks are occur
- As a result, project managers are able to mitigate risk factors and manage their projects better

Quantitative Risk Analysis

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

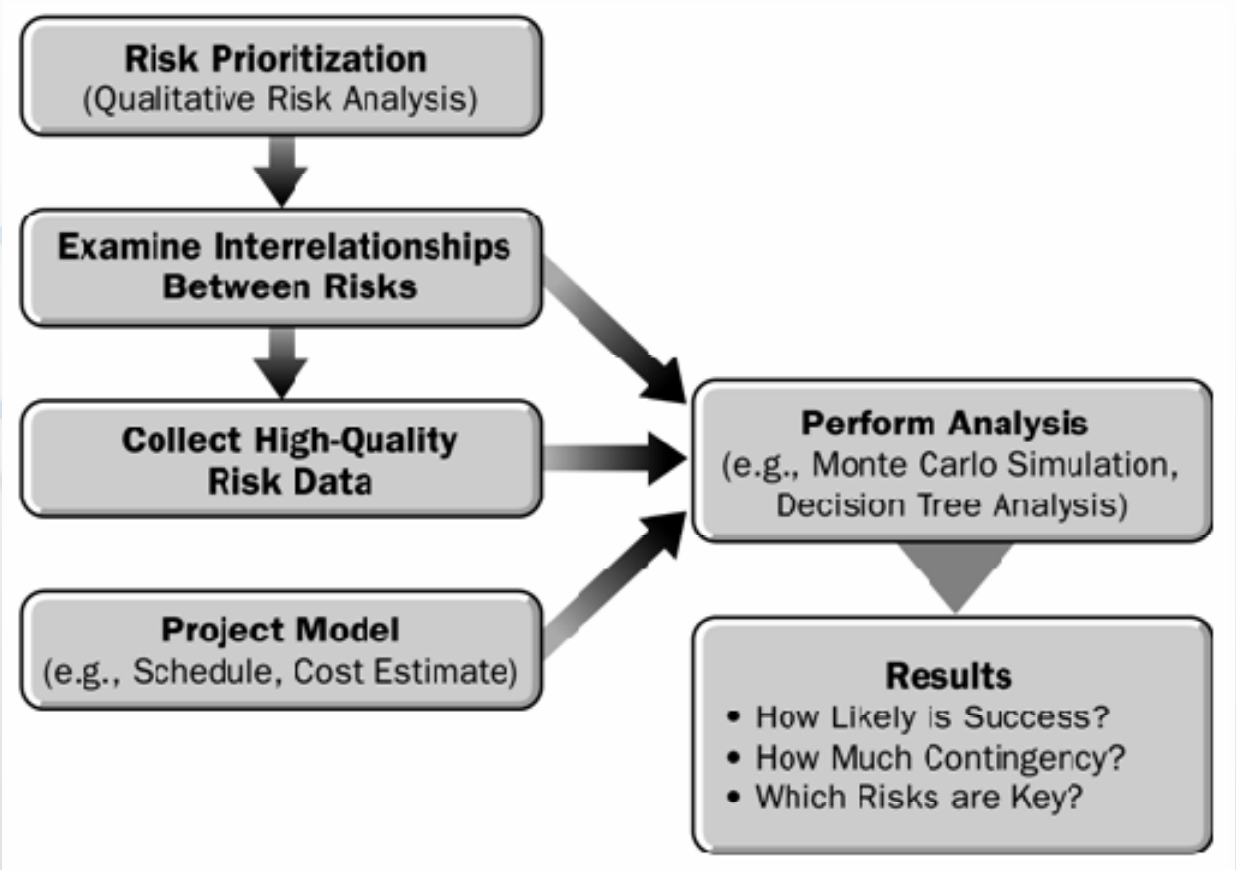
Quantitative Risk Analysis

- Provides a numerical estimate of the overall effect of risk on the objectives of the project, based on current plans and information, when considering risks simultaneously
- Results from this type of analysis can be used to evaluate the likelihood of success in achieving project objectives and to calibrate contingency reserves, usually for time and cost that are appropriate to both the risks and the risk tolerance of project stakeholders
- It is generally accepted that analyzing uncertainty in the project using quantitative techniques such as Monte Carlo simulation may provide more realism in the estimate of the overall project cost or schedule than the traditional approach which assumes that the activity durations or line-item cost estimates are known with certainty

Results of Quantitative Analysis

- What is the probability of meeting the project's objectives?
- How much contingency reserve (e.g., reserves or buffers of scope, time, resources, and cost) is needed to provide the organization with the level of certainty it may require based upon its risk tolerance?
- What are those parts of the project, such as line-item costs or schedule activities, which contribute the most risk when all risks are considered simultaneously?
- Which individual risks contribute the most to overall project risk?

Structure of a Quantitative Risk Analysis



Quantitative Risk Analysis Tools and Techniques

1. Data gathering and representation techniques
2. Quantitative risk analysis and modeling techniques
3. Expert judgment

Data Gathering and Representation Techniques

- Interview
- Probability distribution

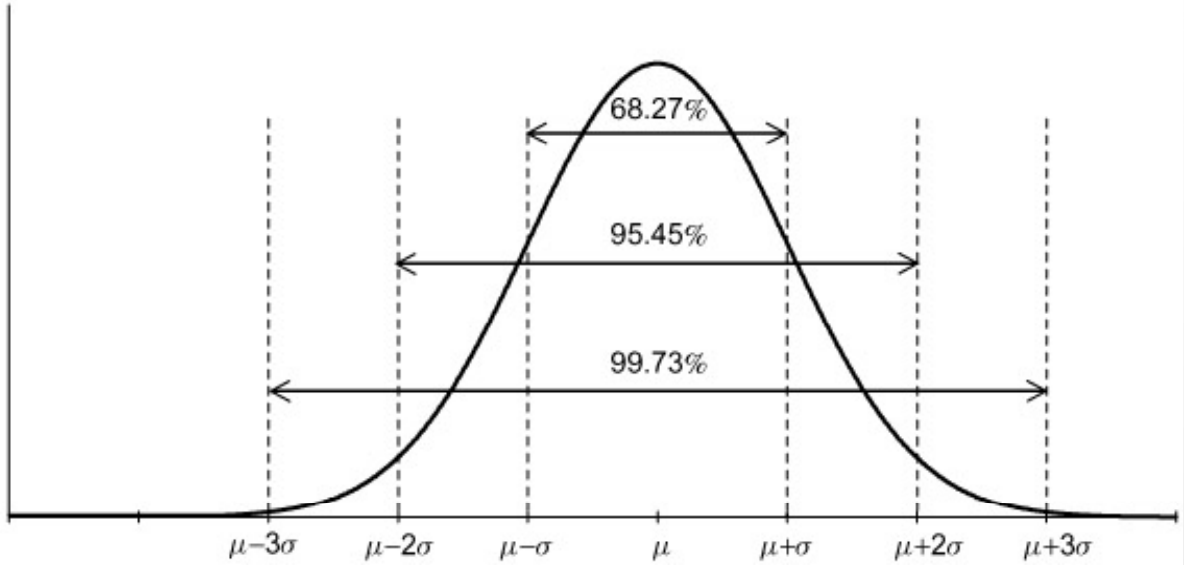
Interviewing

- Draw on experience and historical data to quantify the probability and impact of risks on project objectives
- The information needed depends upon the type of probability distributions that will be used
- Some commonly used distribution use the three-point estimates
- Can provide insight on the reliability and credibility of the analysis

Probability Distribution

- Continuous probability distributions represent the uncertainty in values such as durations of schedule activities and costs of project components
- Beta and triangular distributions are frequently used
- Other commonly used distributions include the uniform, normal and lognormal

Normal Distribution

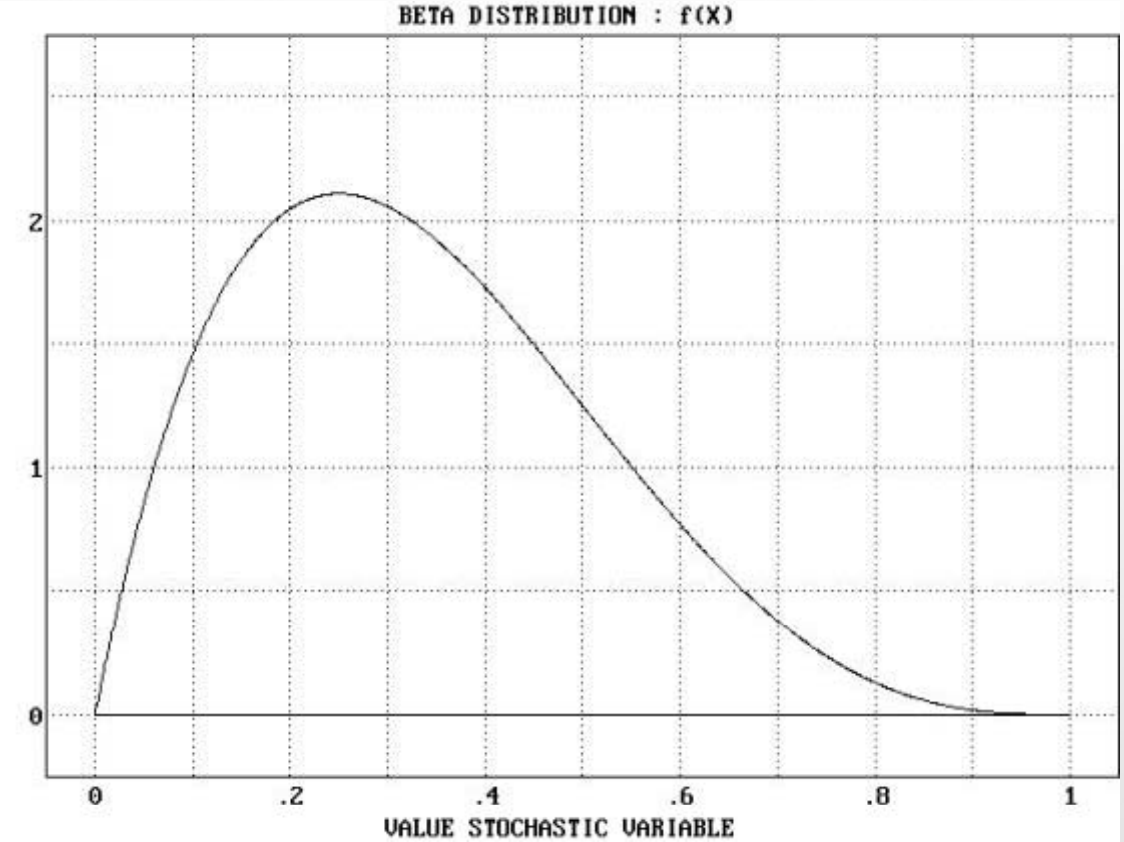


About 68% of the (area under the curve/data) falls within 1 standard deviation of the mean
About 95% of the area under the curve falls within 2 standard deviations of the mean
About 99.7% of the area under the curve falls within 3 standard deviations of the mean

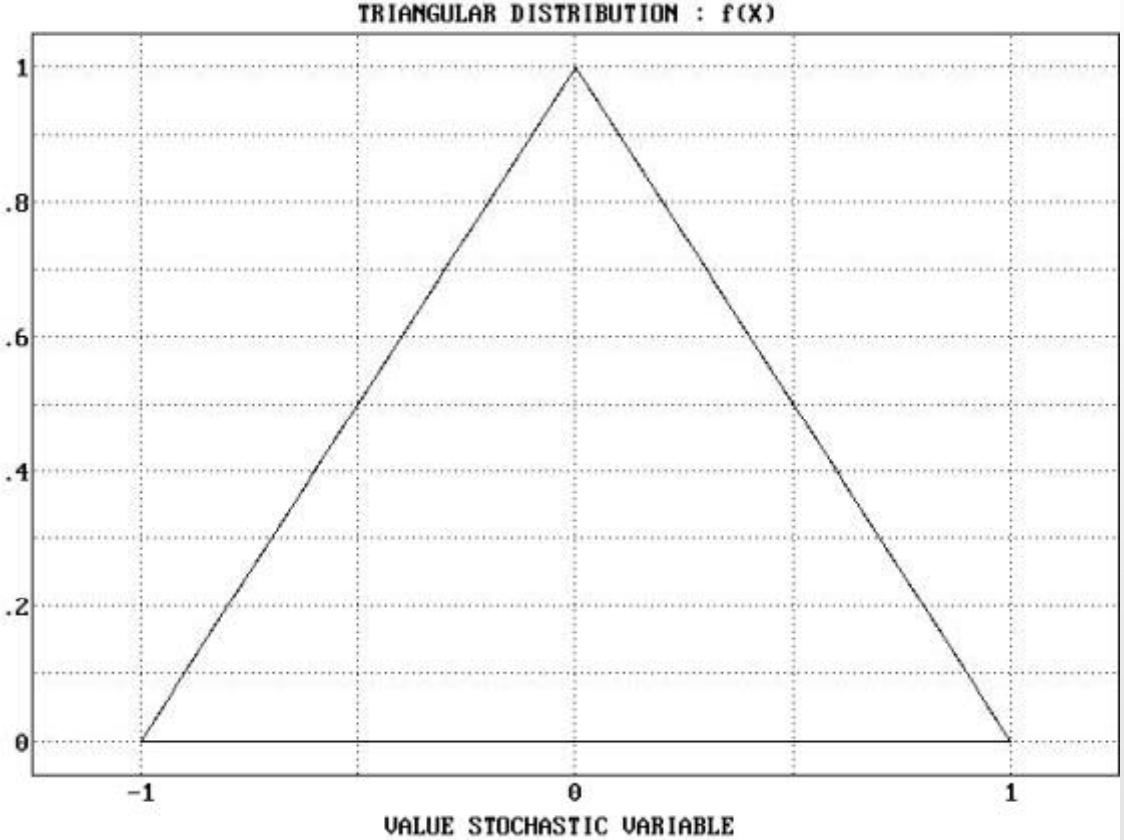
Normal Distribution

- Used in many natural processes
- Gaussian distribution
- Bell shape/ curve
- Symmetric, area under the curve =1
- Specified by 2 parameter mean and standard deviation
- Empirical rules

Beta Distribution



Triangular Distribution



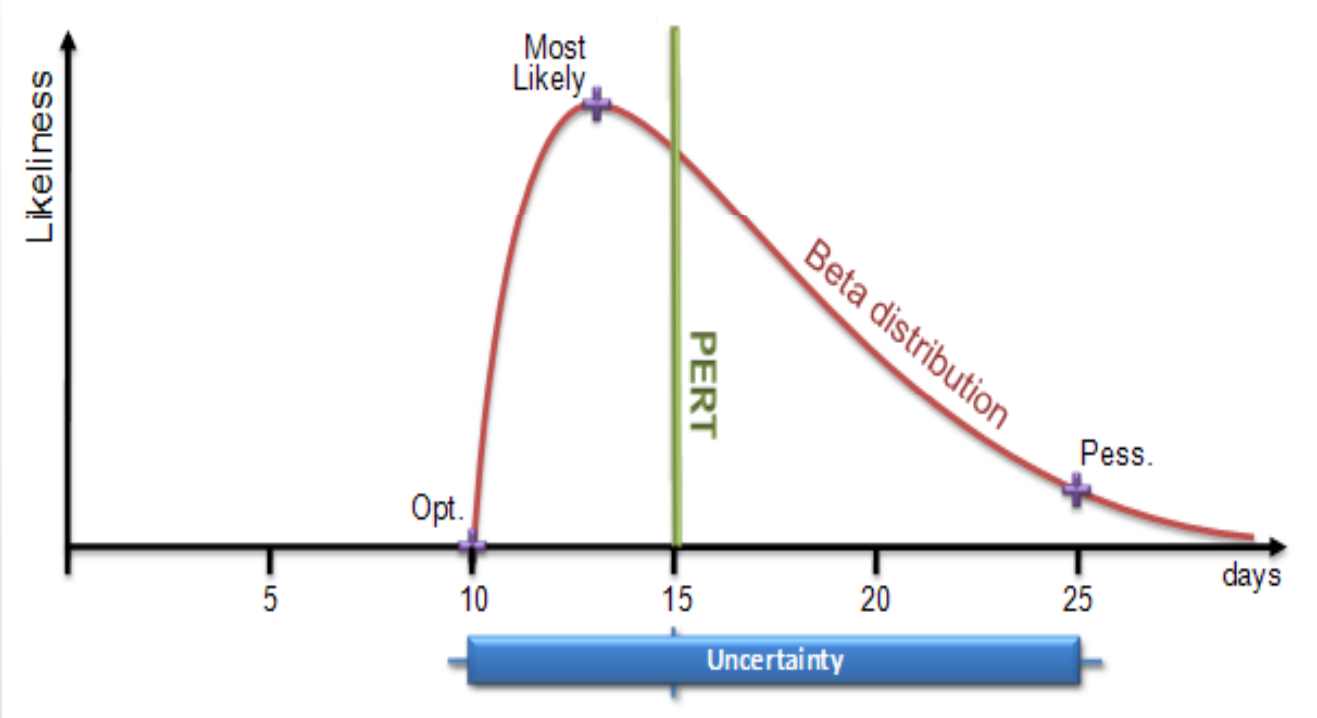
PERT Model

- Program Evaluation and Review Technique
- Three-point estimation assumes that there is uncertainty on costs, efforts and duration. This uncertainty can not be handled by the traditional single estimation point
- expected task duration is calculated as the weighted average of the most optimistic, the most pessimistic, and the most likely time estimates
- The expected duration of any path on the precedence network can be found by summing up the expected durations

PERT Model

- Optimistic: 10 days
- Most likely:13 days
- Pessimistic: 25 days
- Pert (Opt + 4*ML + Pes) / 6
- Pert (10 + 4*13 + 25) / 6
- PERT weighted average ~ 15 days
- Three-point estimations assumes a beta distributions
- The PERT 1-4-1 rule a standard from a document called the DOD-NASA PERT-Cost Guide of 1962

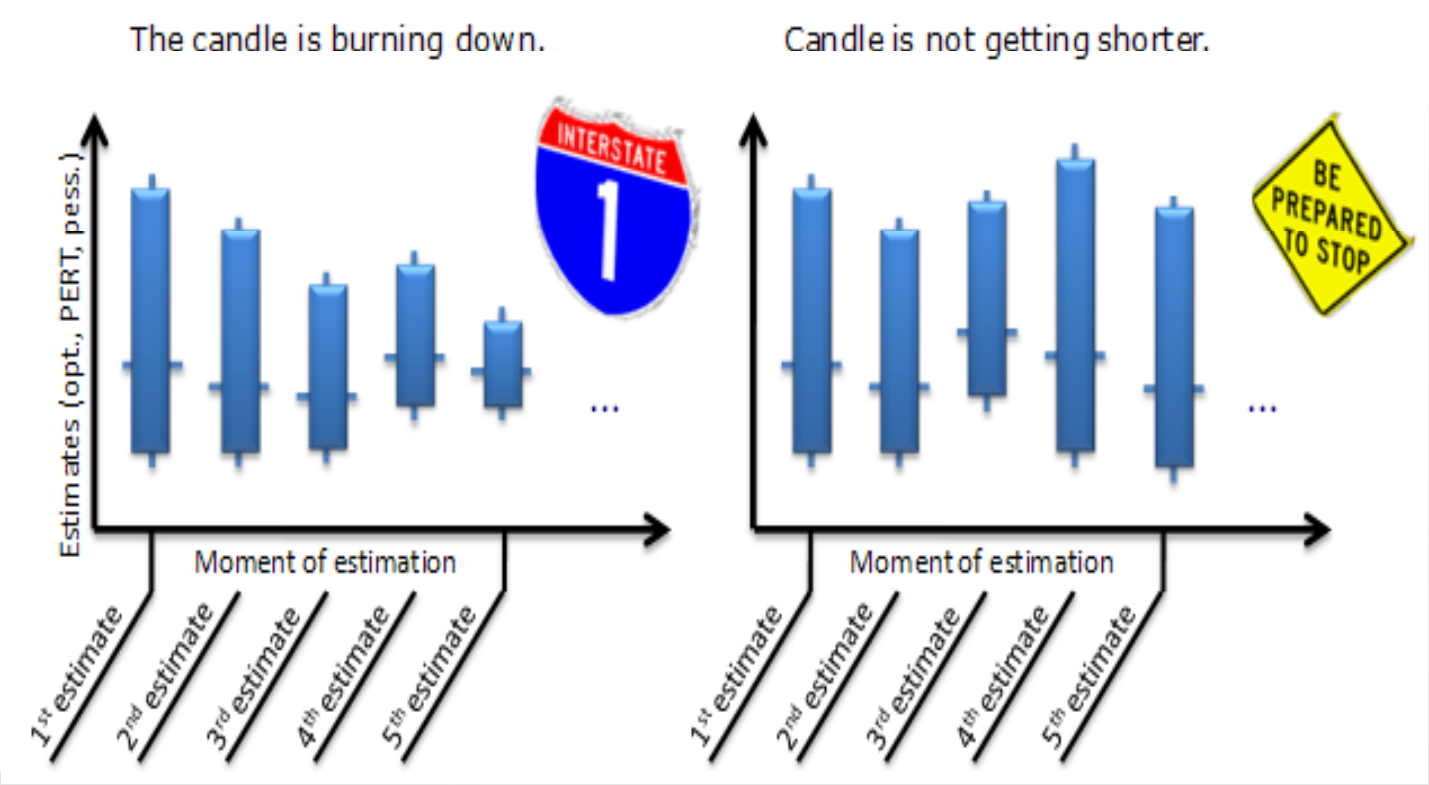
PERT Model


Likeliness
Most Likely
Beta distribution
PERT
Pess.
Opt.
5
10
15
20
25
days
Uncertainty

Three-Point Estimating Benefits

- Estimates are on average ~ 30% faster
- The manager knows for what degree of overruns should be prepared
- Repeating the estimates during the PLC for each activity, the uncertainties should naturally become smaller
- If this doesn't happen, this is a signal that the estimating person doesn't gain confidence, which is an alarm that something may be on the way to go wrong
- Use candle diagrams to visualize the development of uncertainties

Candle Diagrams



PERT Limitations

- The main problem is associated with accurately estimating the optimistic, most likely, and pessimistic durations of the task
- It gives accurate results only if there is a single dominant path through a precedence network

When to Use PERT

- If you have accurate estimations for optimistic, most like and pessimistic durations based on reliable historical data
- If your project has a single dominant path through the network

Workshop

- Using the S/W tool
- Perform PERT analysis

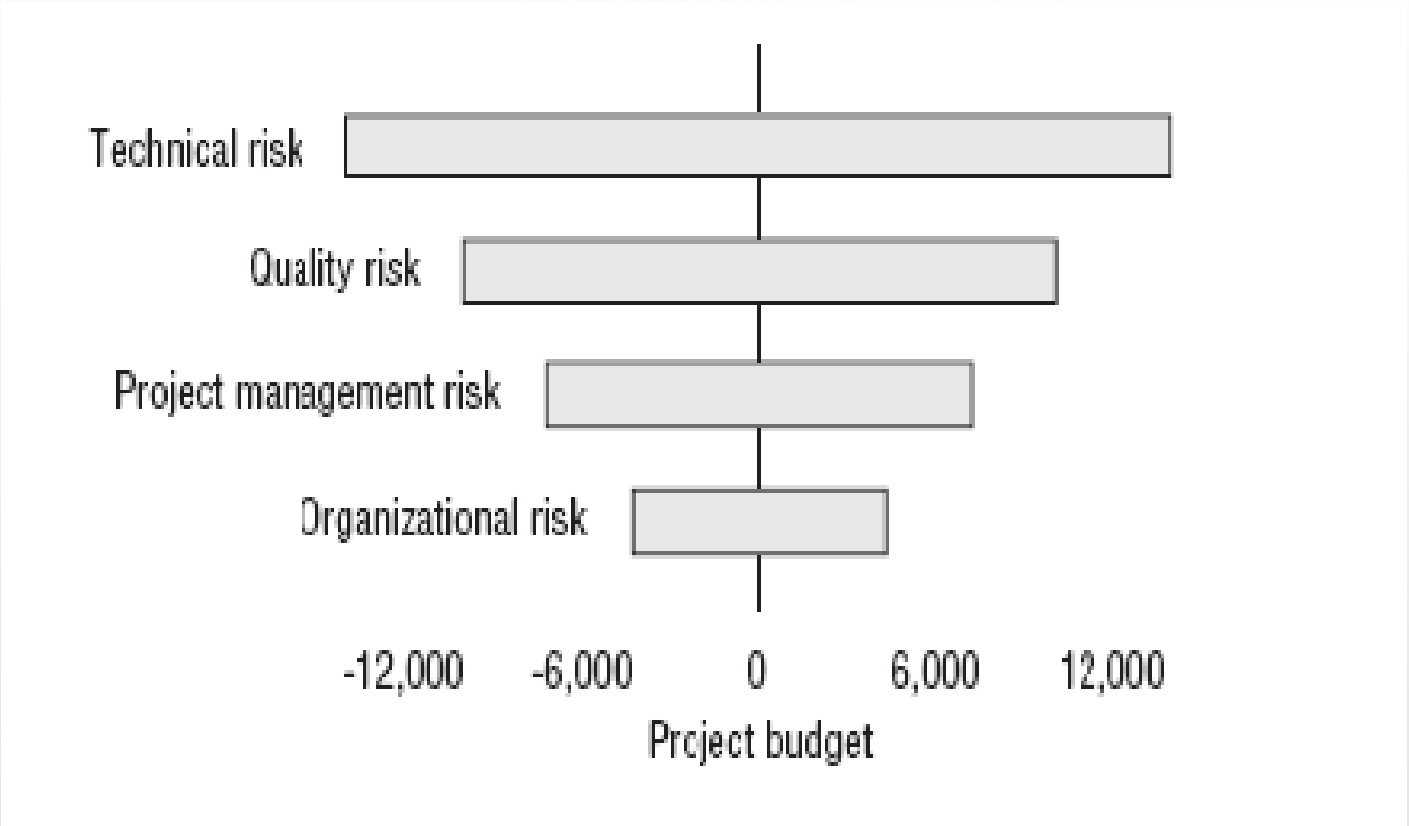
Quantitative Risk Analysis and Modeling Techniques

- Sensitivity analysis
- Expected monetary value analysis
- Modeling and simulation (performed using the Monte Carlo technique)

Sensitivity Analysis

- To determine which risks have the most potential impact on the project
- Tornado diagram (useful for comparing relative importance and impact of variables that have a high degree of uncertainty to those that are more stable

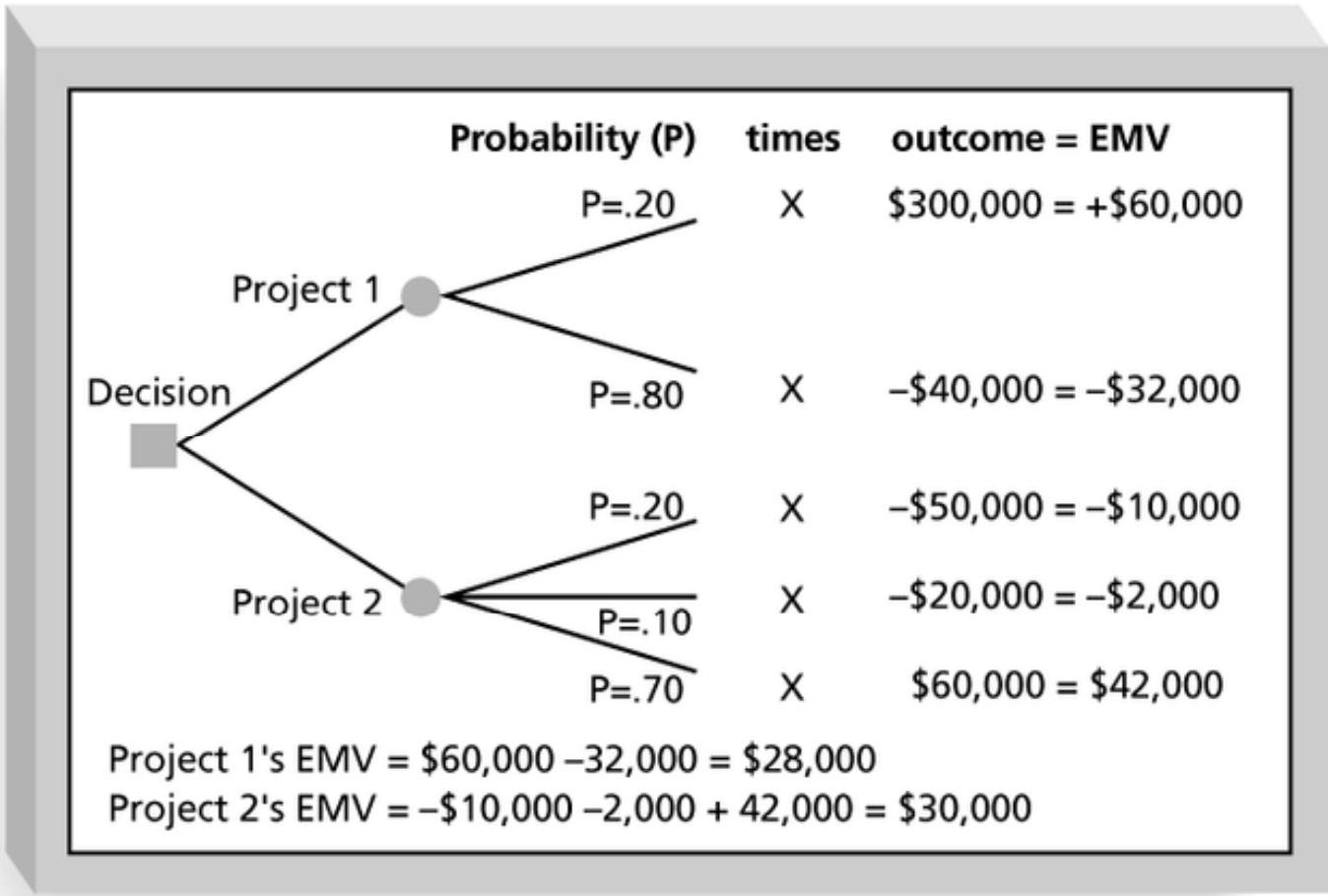
Tornado Diagram



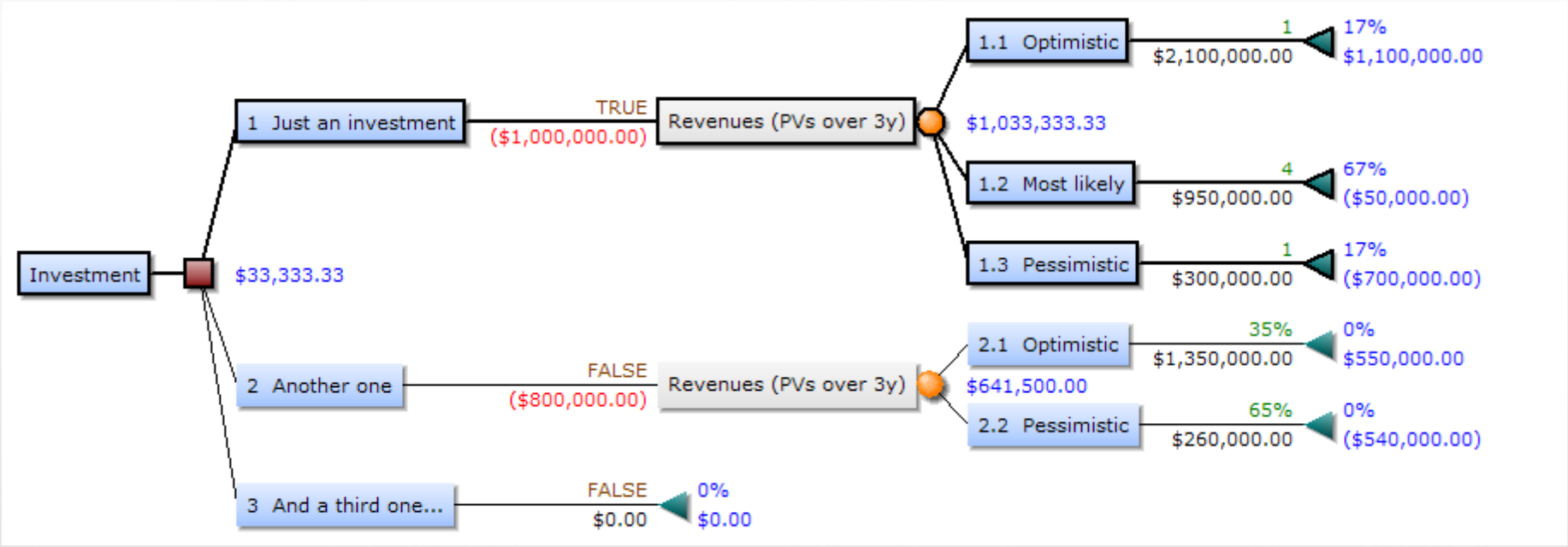
Expected Monetary Value Analysis (EMV)

- A statistical concept that calculates the average outcome when the future includes scenarios that may or may not happen (analysis under uncertainty)
- EMV of opportunities expressed as positive values
- EMV of risks will be negative
- EMV = value of possible outcome X probability of occurrence
- A common use of this type of analysis is in decision tree analysis

Decision Tree Analysis



Decision Tree Analysis



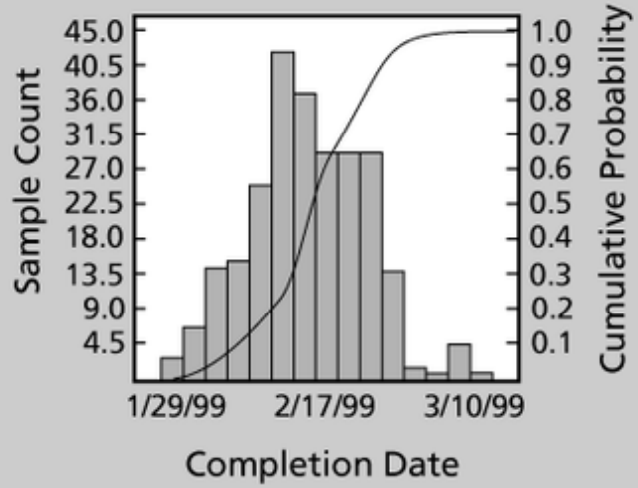
Monte Carlo Analysis

- Estimates are made of potential project schedule and cost outcomes listing the possible completion dates and costs with their associated confidence levels
- This output often expressed as a cumulative distribution
- Can be used to permit quantification of the cost and time contingency reserves

Sample Monte Carlo Simulation Results for Project Schedule

Date: 4/14/99 11:13:56 AM
Number of Samples: 250
Unique ID: 1
Name: Widget

Completion Std Deviation: 5.2d
95% Confidence Interval: 0.6d
Each bar represents 2d



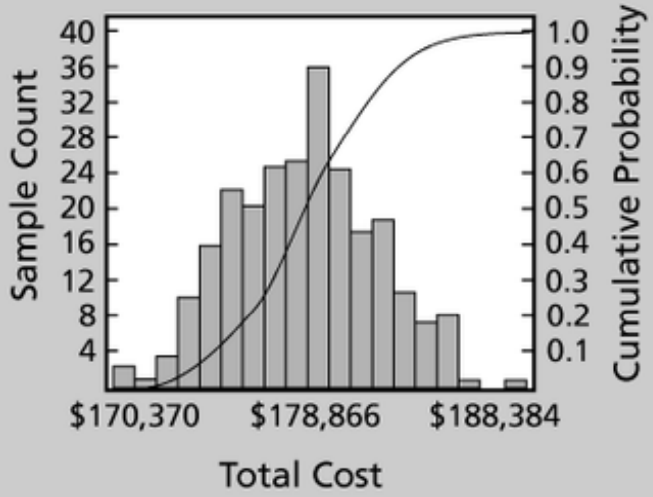
Completion Probability Table

Prob	Date	Prob	Date
0.05	2/4/99	0.55	2/17/99
0.10	2/8/99	0.60	2/18/99
0.15	2/9/99	0.65	2/19/99
0.20	2/10/99	0.70	2/22/99
0.25	2/11/99	0.75	2/22/99
0.30	2/12/99	0.80	2/23/99
0.35	2/15/99	0.85	2/24/99
0.40	2/15/99	0.90	2/25/99
0.45	2/16/99	0.95	2/26/99
0.50	2/17/99	1.00	3/10/99

Sample Monte Carlo Simulations Results for Project Costs

Date: 4/14/99 11:44:56 AM
Number of Samples: 250
Unique ID: 1
Name: Widget

Cost Std Deviation: $3,290
95% Confidence Interval: $408
Each bar represents $1,000



Completion Probability Table

Prob	Cost	Prob	Cost
0.05	$173,748	0.55	$179,327
0.10	$174,472	0.60	$179,556
0.15	$175,266	0.65	$180,015
0.20	$175,693	0.70	$180,518
0.25	$176,362	0.75	$180,984
0.30	$176,940	0.80	$181,611
0.35	$177,597	0.85	$182,387
0.40	$177,963	0.90	$183,208
0.45	$178,508	0.95	$184,528
0.50	$178,973	1.00	$188,384

Monte Carlo Simulations

- Are a process that repeatedly sets values for each random variable by sampling from each variable's statistical distribution
- The variables can be task duration, cost, start and finish time, etc. They are used to calculate the critical path, slack values, etc
- Monte Carlo analysis is used to approximate the distribution of potential results based on probabilistic inputs
- Monte Carlo simulations have been proven an effective methodology for the analysis of project schedule with uncertainties

Risk Register Updates

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

Workshop

- Using the S/W tool
- Perform quantitative risk analysis
  - Monte Carlo simulation
  - Decision tree analysis
  - Sensitivity analysis

Model 05
Risk Response Planning

Plan Risk Responses

- The process of developing options and actions to enhance opportunities and to reduce threats to project objectives

Risk Response Owner

- Take responsibility for each agreed-to and funded risk response

Plan Risk Responses

- It is never feasible or even desirable to eliminate all threats from a project
- Similarly, there is also a limit to the extent to which opportunities can be proactively managed.

Planned Risk Responses

- Appropriate to the significance of the risk
- Cost effective in meeting the challenge
- Realistic within the project context
- Agreed upon by all parties involved
- Timely
- Owned by a responsible person

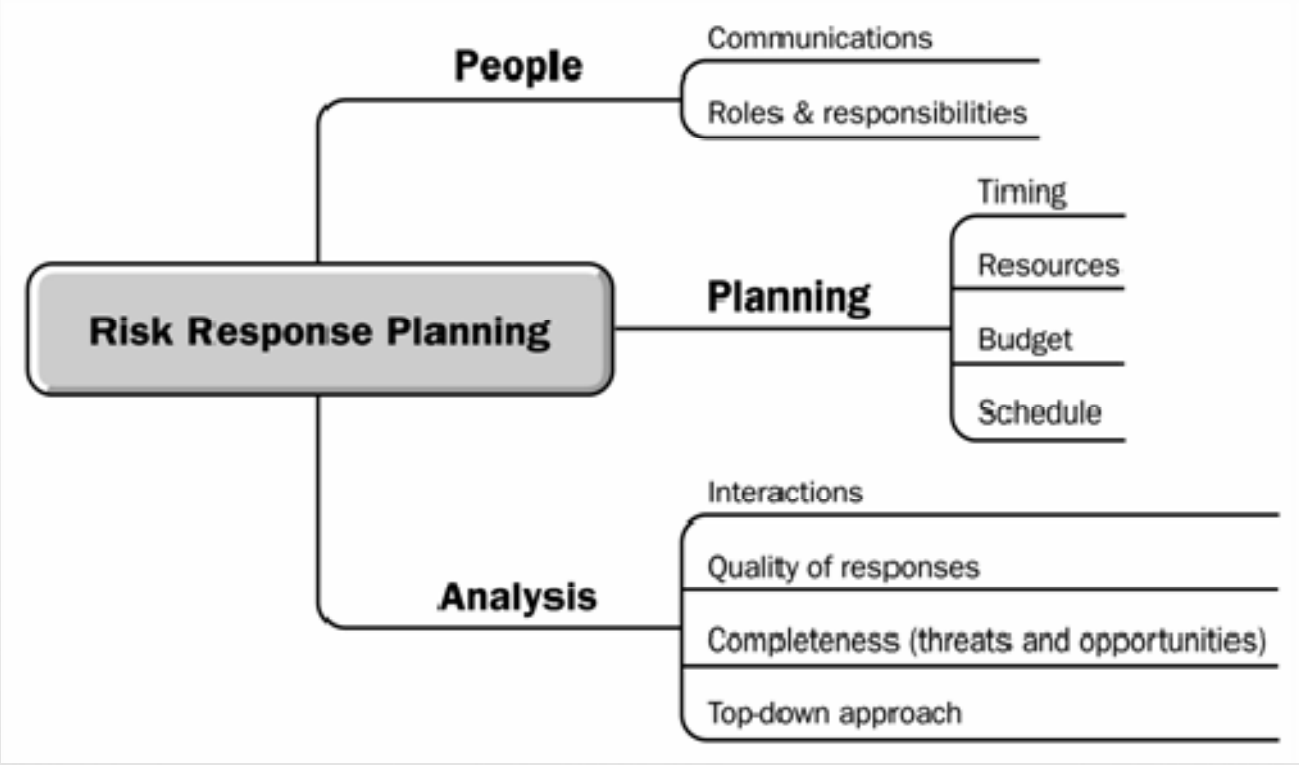
Critical Success Factors for the Plan Risk Responses Process

- Communicate
- Clearly Define Risk-Related Roles and Responsibilities
- Specify Timing of Risk Responses
- Provide Resources, Budget, and Schedule for Responses
- Address the Interaction of Risks and Responses

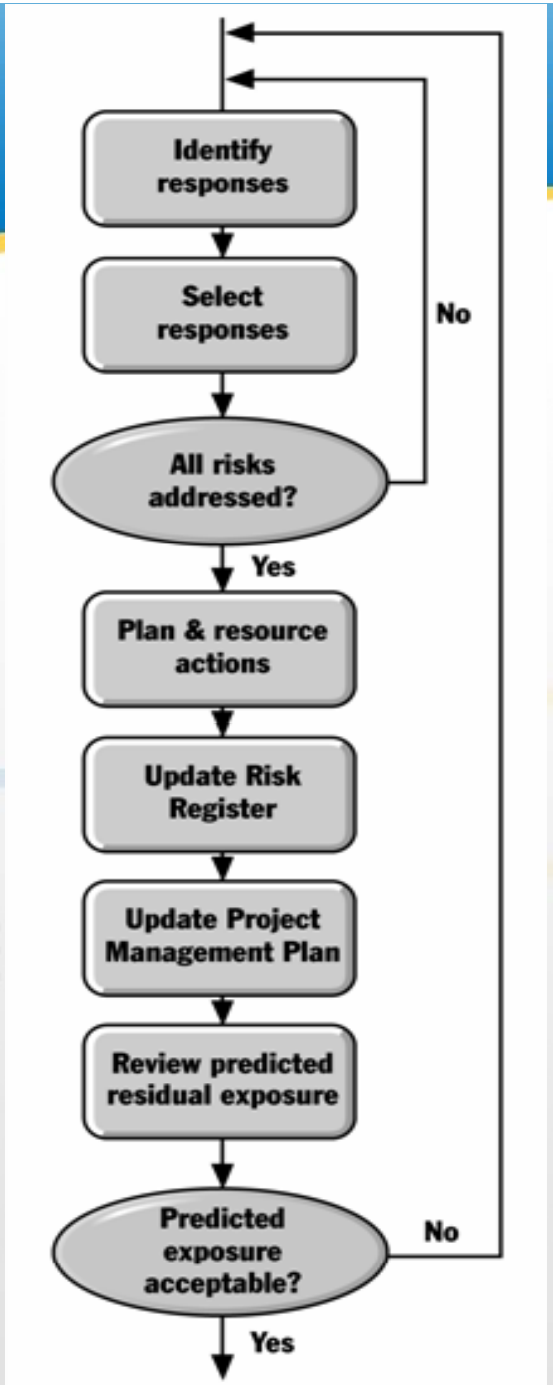
Critical Success Factors for the Plan Risk Responses Process

- Ensure Appropriate, Timely, Effective, and Agreed-Upon Responses
- Address Both Threats and Opportunities
- Develop Strategies before Tactical Responses

Main Considerations for Risk Response Planning



The Steps Involved in Planning Risk Responses



Strategies for Negative Risks or Threats

- Avoid
- Transfer
- Mitigate
- Accept

Avoid

- Changing the project management plan to eliminate the threat entirely
- Isolate the project objectives from the risk's impact, or change the objective that is in jeopardy
- Examples (extending the schedule, reducing scope, clarifying requirements, obtaining information, improving communication, or acquiring expertise)

Avoid

- Replace recourses
- Changing the project management plan
- Extending the schedule
- Reducing scope

Transfer

- Shifting some or all of the negative impact of a threat, along with ownership of the response, to a third party
- Examples (financial risk exposure, payment of a risk premium, insurance, performance bonds, warranties, guarantees, contracts)

Transfer

- Insurance
- Contracts
- Performance bonds
- Warranties
- Guarantees

Mitigate

- Reduction in the probability and/or impact of an adverse risk event to be within acceptable threshold limits
- Examples (Adopting less complex processes, conducting more tests, or choosing a more stable supplier)

Mitigate

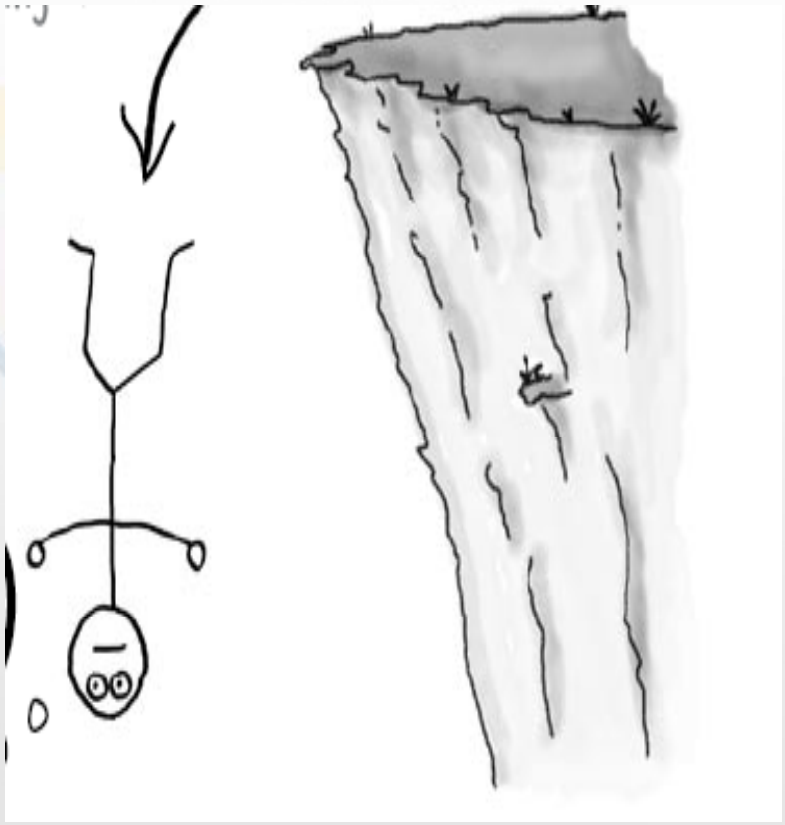
- Training
- More test
- Clarifying requirements
- Obtaining information
- Improving communication
- Acquiring expertise

Accept

- Adopted because it is seldom possible to eliminate all threat from a project
- Can be either passive (no action) or
- Active (establish a contingency reserve, including amounts of time, money, or resources)

Accept

- Passive (No action, the project team will deal with the threats or opportunities as they occur)
- Active (establish a contingency reserve (time, money, or resources))



Strategies for Positive Risks or Opportunities

- Exploit
- Share
- Enhance
- Accept

Exploit

- To ensure that the opportunity is realized
- Ensuring the opportunity definitely happens

Share

- Allocating some or all of the ownership of the opportunity to a third party who is best able to capture the opportunity for the benefit of the project

Enhance

- To increase the probability and/or the positive impacts of an opportunity
- Identifying and maximizing key drivers of these positive-impact risks may increase the probability of their occurrence

Accept

- Is being willing to take advantage of it if it comes along but not actively pursuing it

Fallback Plan

- Plan B
- Use as a reaction to a risk that has occurred, and the primary response proves to be inadequate

Fallback Plan

Residual Risks

- Risks that are expected to remain after planned responses have been taken, as well as those that have been deliberately accepted

Secondary Risk

- Side effect
- Risk that arise as a direct outcome of implementing a risk response

Risk Register Updates

- Identified risks
- Risk owners and assigned responsibilities
- Outputs from the Perform Qualitative Analysis process
- Agreed-upon response strategies
- Specific actions to implement the chosen response strategy
- Triggers, symptoms and warning signs of risks' occurrence
- Budget and schedule activities required to implement the chosen responses
- Contingency plans and triggers that call for their execution
- Fallback plans
- Residual risks
- Secondary risks
- Contingency reserves

Risk Register

Description	Probability	Impact	Severity	Response
Lake of sponsorship	10%	80%		Mitigation, Continuous management support and commitment
Unclear Project Dependencies	30%	80%		Mitigation, Accurate planning
Unclear Alignment of vendor objectives with Program Objectives	50%	80%		Mitigation, Clear objectives documentation and verification

Workshop

- Plan your response strategy

Model 06
Monitor and Control Project Risk

Monitor and Control Risks

- The process of implementing risk response plans, tracking identified risks, monitoring residual risks, identifying new risks, and evaluating risk process effectiveness throughout the project

Risk Trigger

- An indication that a risk has occurred or is about to occur
- Risk symptoms or warning signs
- Triggers may be discovered in the risk identification process and watched in the risk monitoring and control process

Purpose of Monitor & Control Risks

- Project assumptions are still valid
- Analysis shows an assessed risk has changed or can be retired
- Risk management policies and procedures are being followed
- Contingency reserves of cost or schedule should be modified in alignment with the current risks assessment

Critical Success Factors for the Monitor and Control Risks Process

- Integrate Risk Monitoring and Control with Project Monitoring and Control
- Continuously Monitor Risk Trigger Conditions
- Maintain Risk Awareness

Risk Reassessment

- Identification of new risks
- Reassessment of current risks
- Closing of outdated risks

Typical Reasons for Risk Reassessment

- Occurrence of a major unexpected risk
- Need to analyze a complex change request
- Phase end review
- Periodic review to ensure that the information remains current

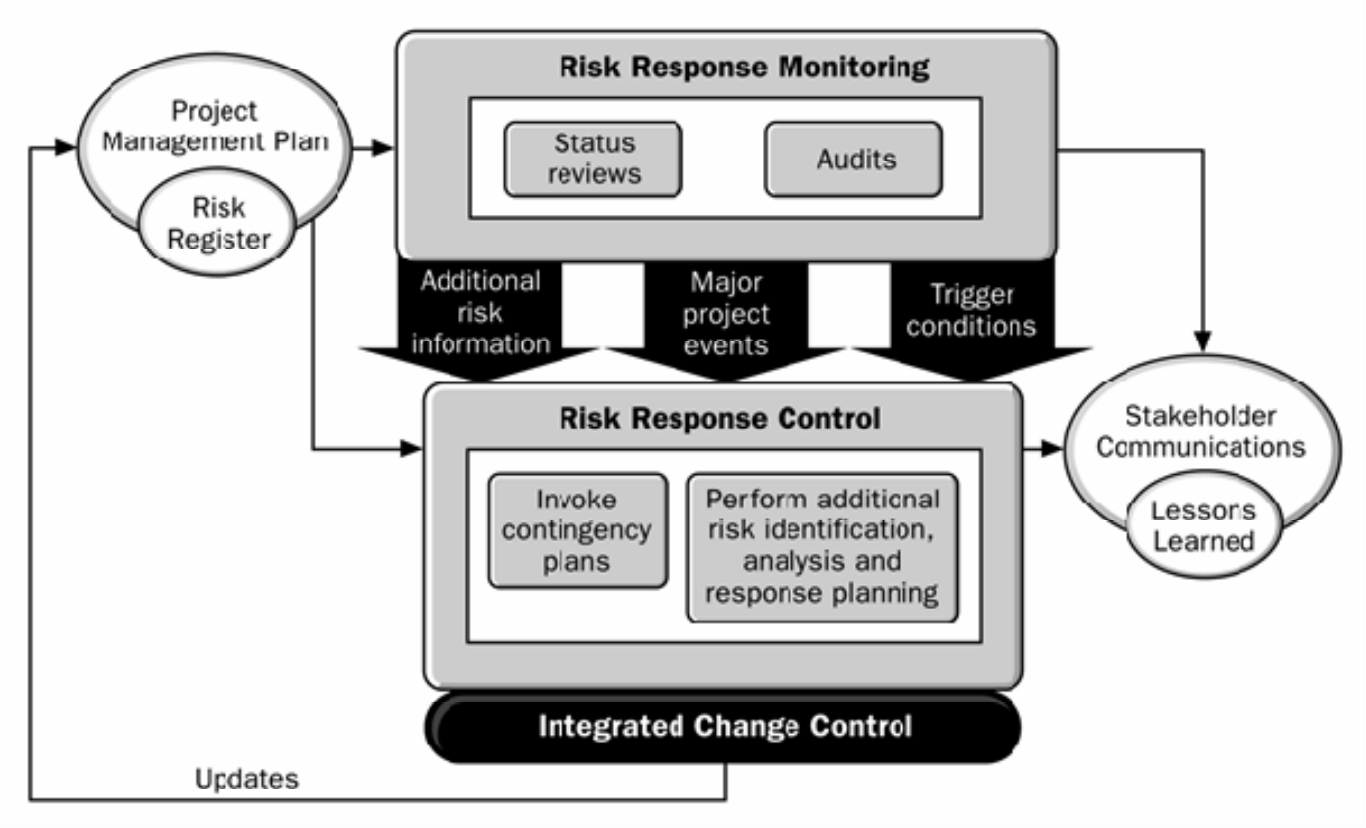
Risks Audits

- Examine and document the effectiveness of risk responses
- Examine and document the effectiveness of the risk management process

Reserve Analysis

- Compares the amount of the contingency reserves remaining to the amount of risk remaining at any time in the project in order to determine if the remaining reserve is adequate

Schematic Representation of the Monitor and Control Risk Process



Risk Register Updates

- Outcomes of risk reassessment, risk audits, periodic risk reviews, identification of new risks, update risk register elements, and closing risk
- Actual outcomes of the project's risks and of the risk responses

Workaround plan

- Responses that were not initially planned but are required to deal with emerging risks that were previously unidentified or accepted passively

Risk Management Maturity Level

1. Risk management **mandated by Board**/senior management.
2. Established **risk management organization**.
3. Risk management **policy**.
4. Risk management **process**.
5. Defined **method for embedding risk management**.
6. Explicit **reporting requirements**.
7. Type of risk management **tools** used.
8. Risk management **information captured in a consistent way**.
9. **Frequency** of risk management **carried out**.
10. **Organizational activities** that **include risk management**.
11. Risk management being used to **support opportunity seeking behaviour**.
12. Risk management **increased Board confidence in pursuing new opportunities**.
13. Process of **continual improvement**.

Key Success Factors

- Full support from the Board, Investment Panel, CEO and Management.
- Committed Risk Champions.
- Competence and committed consultant.
- Effective Project Management.
- Risk Awareness Training and Facilitation Workshops.
- Computerised System.
- Organisation culture

Model 07
Recape

Critical Success Factors for Project Risk Management

- Project Risk Management must be recognized as a valuable discipline, which provides a positive return on investment by organizational management, project stakeholders, project management, and team members
- All parties must be committed, up to the highest level of management, to the principles of Project Risk Management
- Project participants and stakeholders must all accept responsibility for undertaking risk-related activities as required. Risk management is everybody's responsibility
- There must be open communication among project participants concerning project risk. Any actions or attitudes that hinder communication about project risk reduce the effectiveness of Project Risk Management
- Risk management does not exist in a vacuum, isolated from other project management processes. Successful risk management requires the correct execution of the other project management processes
- Risk management activities should be consistent with the value of the project to the organization and with its level of project risk, its scale, and other organizational constraints


Value Risk Management
Integrate with Project Management
Individual Commitment/ Responsibility
Risk Management Success
Risk Effort Scaled to Project
Open & Honest Communication
Organizational Commitment

Project Risk Perceptions

- My project wont hurt anybody
- Our company has “kill the messenger” syndrome
- Firefighting is rewarded and tangible
- Failure is not an option so why focus on risk
- Nothing happened before so why bother?

Risk Management Obstacles

- PM does not have the right tools and techniques
- PM attempt to build a risk plan on his own (limited buy-in and limited scope)
- Lack of management support and commitments
- Prepare a risk plan with insufficient project knowledge
- Risk management is not an integral part of the organization's project methodology
- Too little time is invested in identifying and managing risks
- Too few risks are identified (10 to 20)

Challenges in Implementing Risk Management

1. Risk manager has limited, ambiguous, or no mandate
2. No risk management orientation, awareness program for senior management, executive and staff
3. No uniform approach to risk management and reporting to ensure adoption of best practices
4. No readily available formal risk management training and tools
5. No buy-in from middle, junior managers and staff
6. No regular assessment of risk management training needs
7. No standard process and procedure for addressing concerns about risk management tools or practices
8. Inadequate budget for embedding and executing risk management
9. No corporate process for identifying good practices or documenting them
10. No sharing of good practices across the organization on a regular basis

Case Studies

1. Governance and risk management in manufacturing
2. Risks in construction projects
3. Ford Motor – Global Mindset and Risk Assessment

Model 08
PMI-RMP Exam Preparation

RMP Domains

- Risk Communication
- Risk Analysis
- Risk Response Planning
- Risk Governance

Risk Communication Tasks

1. Lead the risk management function by applying interpersonal skills to heighten awareness of the value of risk management
2. Gather relevant information using human and automated sources in order to assess and communicate the sensitivity of the stakeholder to risk
3. Document risk-related information using standard tools and techniques in order to establish and maintain a common understanding of the risks
4. Create regular status reports using performance metrics as specified in the risk management plan in order to update the stakeholders

Risk Analysis Tasks

1. Identify all relevant risks (positive and negative) using human and automated sources in order to scope the potential impact(s) of these risks
2. Evaluate the attributes of the identified risks using qualitative and quantitative tools and techniques in order to establish a uniform context for the risk response process
3. Prioritize the evaluated risks based on collected stakeholder sensitivity in order to facilitate decision and action
4. Establish control limits by completing a risk tolerance assessment in order to influence risk response and monitor trends

Risk Response Planning Tasks

1. Develop a risk (positive and negative) response strategy from the policy and information gathered during risk analysis in order to ensure timely and defined action when required
2. Develop a contingency approach using the response strategy and relevant scenarios in order to prepare for the occurrence of anticipated risks and unanticipated events
3. Present recommendations to key stakeholders based on risk response values and other influences in order to obtain authorization for response plan execution

Risk Governance Tasks

1. Capture lessons learned by formal and informal means in order to incorporate them into future risk planning
2. Refine risk policies and practices using lessons learned in order to improve risk management effectiveness
3. Create the risk management plan using relevant policies and standards in order to direct risk management activities
4. Establish metrics for risk management processes by defining baselines in order to evaluate performance
5. Examine process performance using established metrics and standard tools in order to drive risk process improvements
6. Monitor risk performance using the risk response plan in order to initiate corrective actions
7. Identify relevant policies and standards using internal and external sources in order to integrate the applicable elements into the risk management plan

Demo

- How to fill the exam application

PMI-RMP Exam Registration Process

1. Application approval
2. Submit exam payment
3. Audit process
4. Selecting the exam date
5. Sitting for the exam

Exam Preparation

- Study Plan
- Study materials
  - *PMBOK® Guide*
  - Practice Standard for Project Risk Management, 2nd edition
  - Exam preparation books
  - Exam simulation engines
  - Mock exams

The Exam Day

- Before the exam day
- What to bring with you
- Acceptable identification documents
- During the exam
- After the exam


THANK YOU