Information Technology Project Management – Fifth Edition

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Managing Project Risk

Chapter 7

Learning Objectives

- Describe the project risk management planning framework introduced in this chapter.
- Apply risk identification tools and understand the causes, effects, and the integrative nature of project risks.
- Apply several qualitative and quantitative analysis techniques that can be used to prioritize and analyze various project risks.
- Describe the various risk strategies, such as insurance, avoidance, or mitigation.
- Describe risk monitoring and control.
- Describe risk evaluation in terms of how the entire risk management process should be evaluated in order to learn from experience and to identify best practices.

Common Mistakes in Managing Project Risk

- Not understanding the benefits of risk management
- Not providing adequate time for risk management
- Not identifying and assessing risk using a standardized approach

Effective & Successful Risk Management Requires

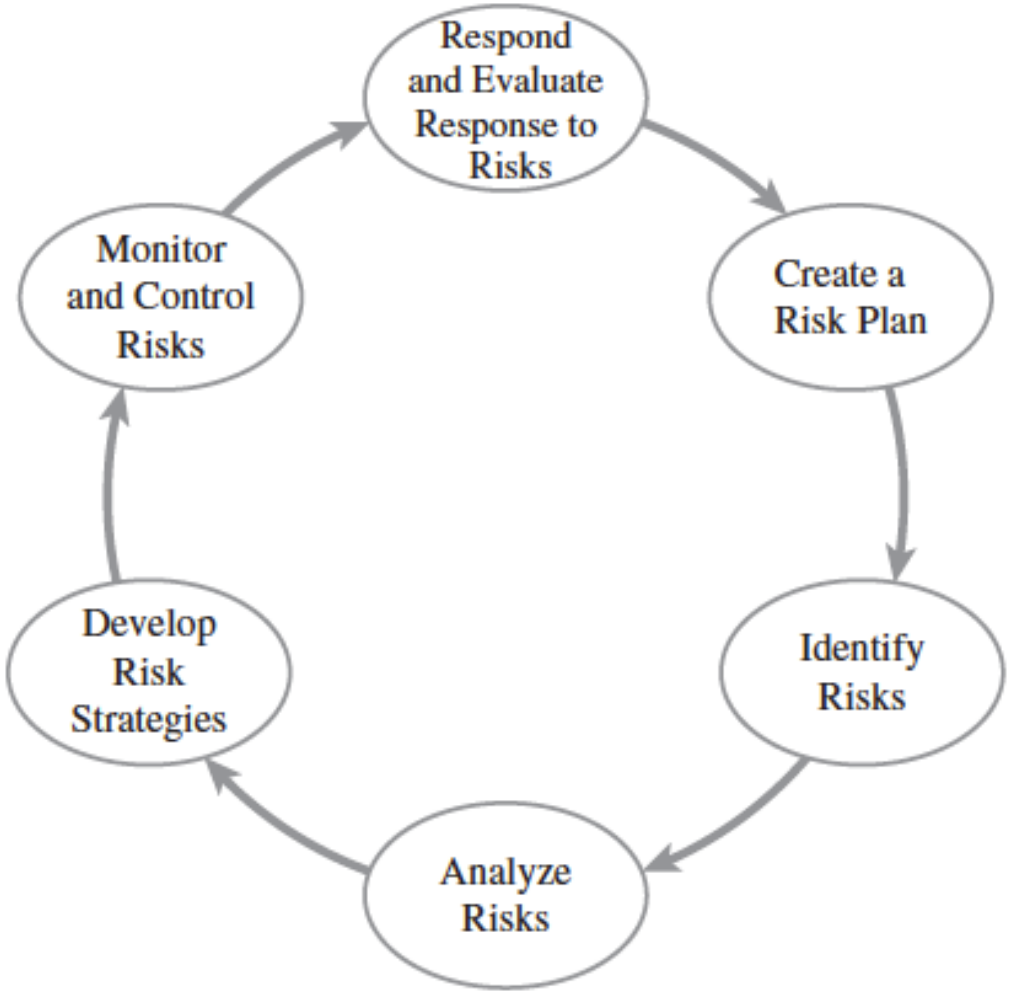
- Commitment by all stakeholders
- Stakeholder responsibility
- Different risks for different types of projects

Definition of Risk (PMBOK® Guide)

- An uncertain event or condition that, if occurs, has a positive or negative effect on one or more of the project objectives such as scope, schedule, cost, and quality.

Project Risk Management Processes

1. Create a Risk Plan
2. Identify Risks
3. Analyze Risks
4. Develop Risk Strategies
5. Monitor and Control Risks
6. Respond and Evaluate Risk

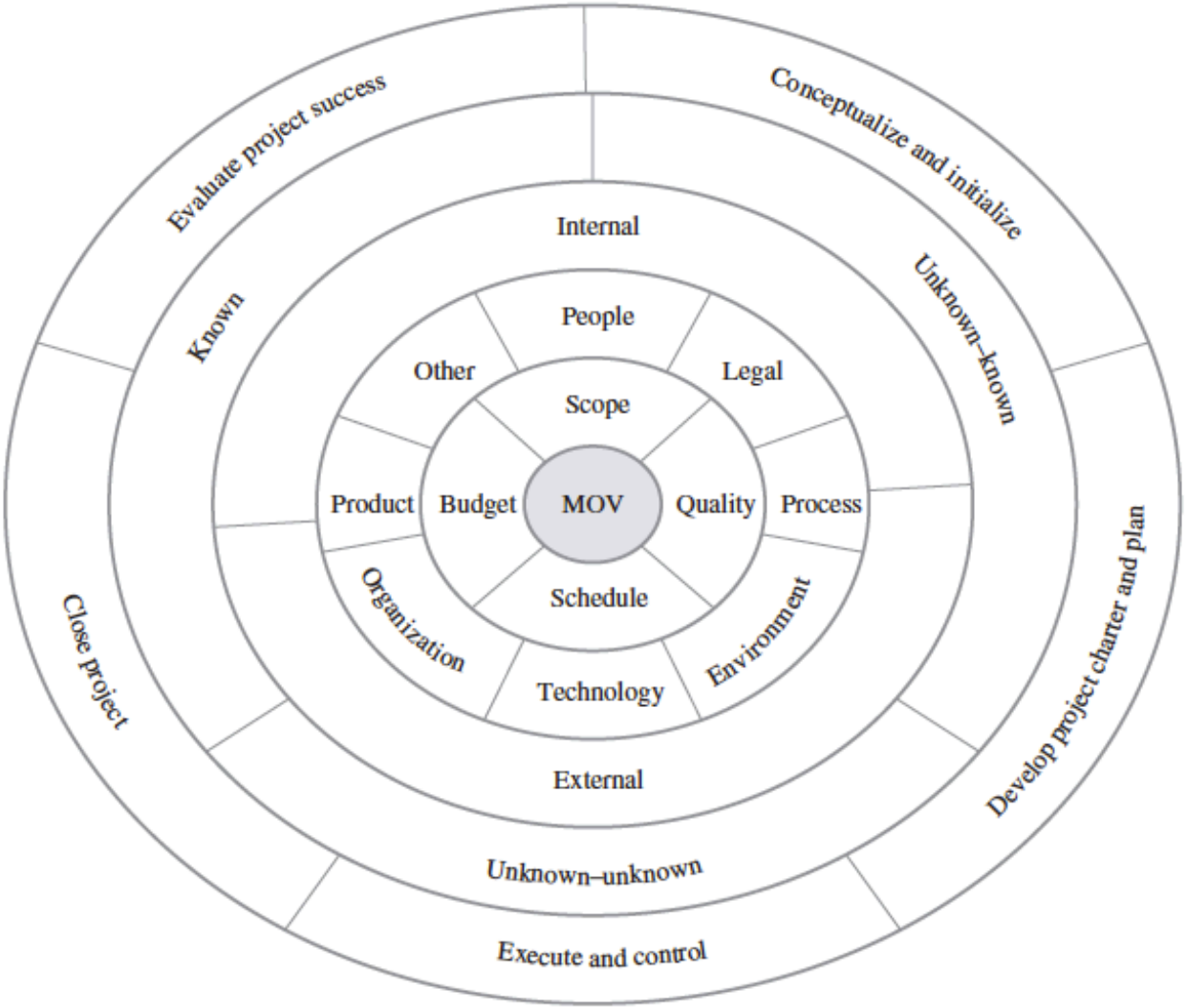


Step 1 – Create A Risk Plan

- Requires firm commitment by all stakeholders to the entire Risk Management (RM) approach
  - RM should align throughout the organization

- Risk Planning focuses on preparation
  - Systematic preparation and planning can help minimize adverse effects on the project while taking advantage of opportunities as they arise

STEP 2 – Identify Risks through a Project Risk Identification Framework



STEP 2 – Identify Risks through Risk Identification Tools & Techniques

- Learning Cycles
- Brainstorming
- Nominal Group Technique
- Delphi Technique
- Interviews
- Checklists
- SWOT Analysis
- Cause & Effect (a.k.a. Fishbone/Ishikawa)
- Past Projects

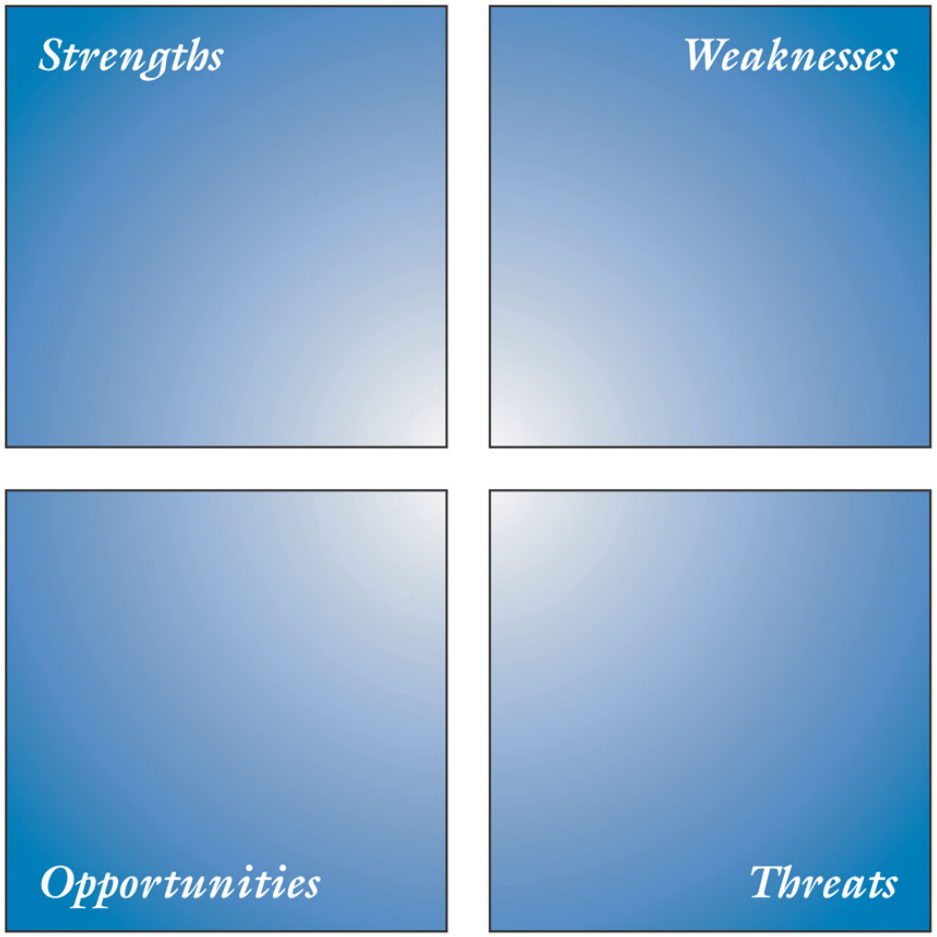
STEP 2 – Identify Risks through Risk Identification Tools & Techniques – *Nominal Group Technique (NGT)*

1. Each individual silently writes their ideas on a piece of paper
2. Each idea is then written on a board or flip chart one at a time in a round-robin fashion until each individual has listed all of his or her ideas
3. The group then discusses and clarifies each of the ideas
4. Each individual then silently ranks and prioritizes the ideas
5. The group then discusses the rankings and priorities
6. Each individual ranks and prioritizes the ideas again
7. The rankings and prioritizations are then summarized for the group

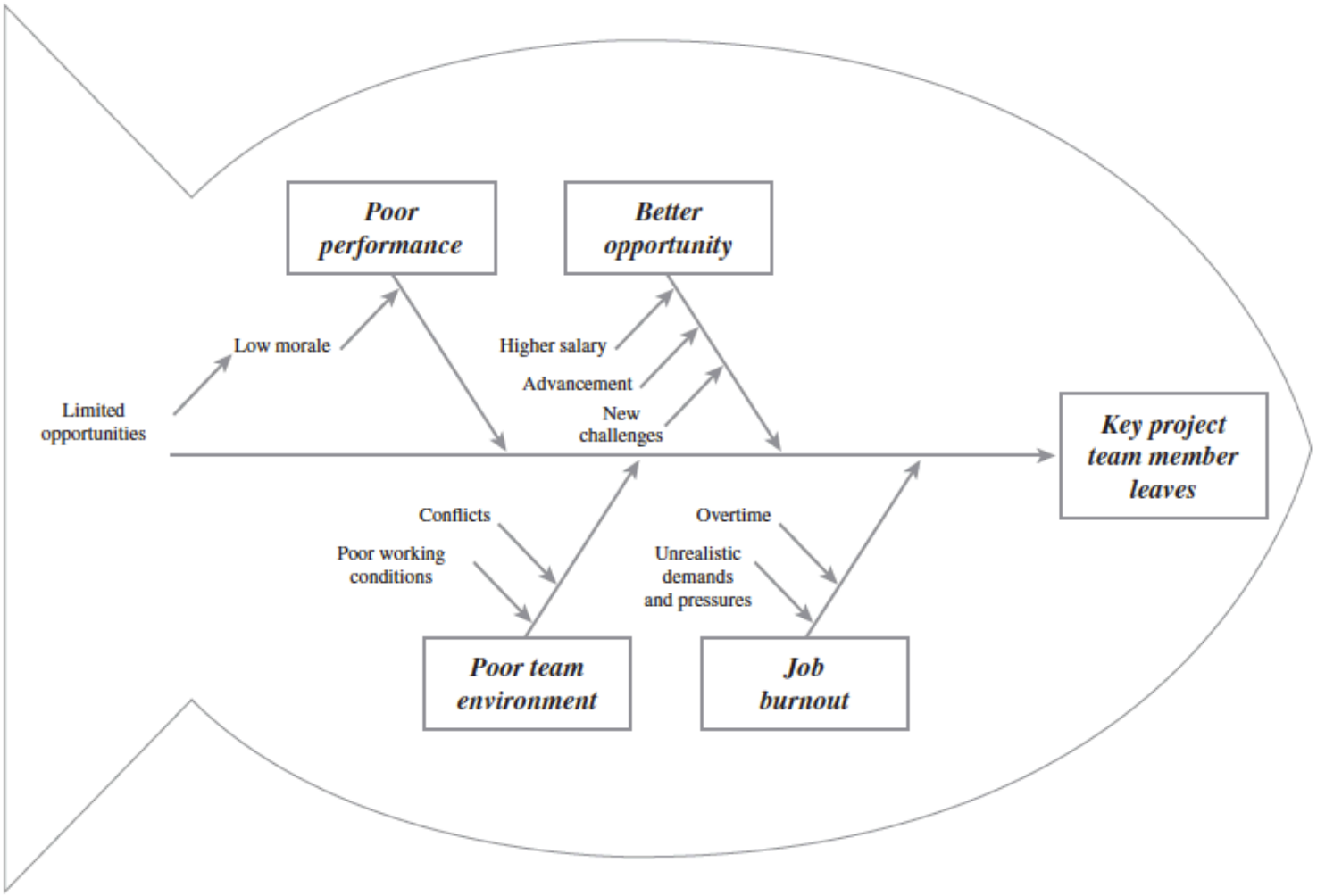
STEP 2 – Identify Risks through Risk Identification Tools & Techniques – *Risk Check List*

- ❑ Funding for the project has been secured
- ❑ Funding for the project is sufficient
- ❑ Funding for the project has been approved by senior management
- ❑ The project team has the requisite skills to complete the project
- ❑ The project has adequate manpower to complete the project
- ❑ The project charter and project plan have been approved by senior management or the project sponsor
- ❑ The project's goal is realistic and achievable
- ❑ The project's schedule is realistic and achievable
- ❑ The project's scope has been clearly defined
- ❑ Processes for scope changes have been clearly defined

STEP 2 – Identify Risks through Risk Identification Tools & Techniques – *SWOT Analysis*



STEP 2 – Identify Risks through Risk Identification Tools & Techniques – *Cause & Effect Diagram*



STEP 3 – Analyze Risks

$$\text{Risk} = f(\text{Probability} * \text{Impact})$$

Risk assessment focuses on prioritizing risks so that an effective strategy can be formulated for those risks that require a response.

Depends on Stakeholder risk tolerances

Can't respond to all risks!

STEP 3 – Analyze Risks
Qualitative Approaches

- Expected Value & Payoff Tables
- Decision Trees
- Risk Impact Table & Ranking
- Tusler's Risk Classification

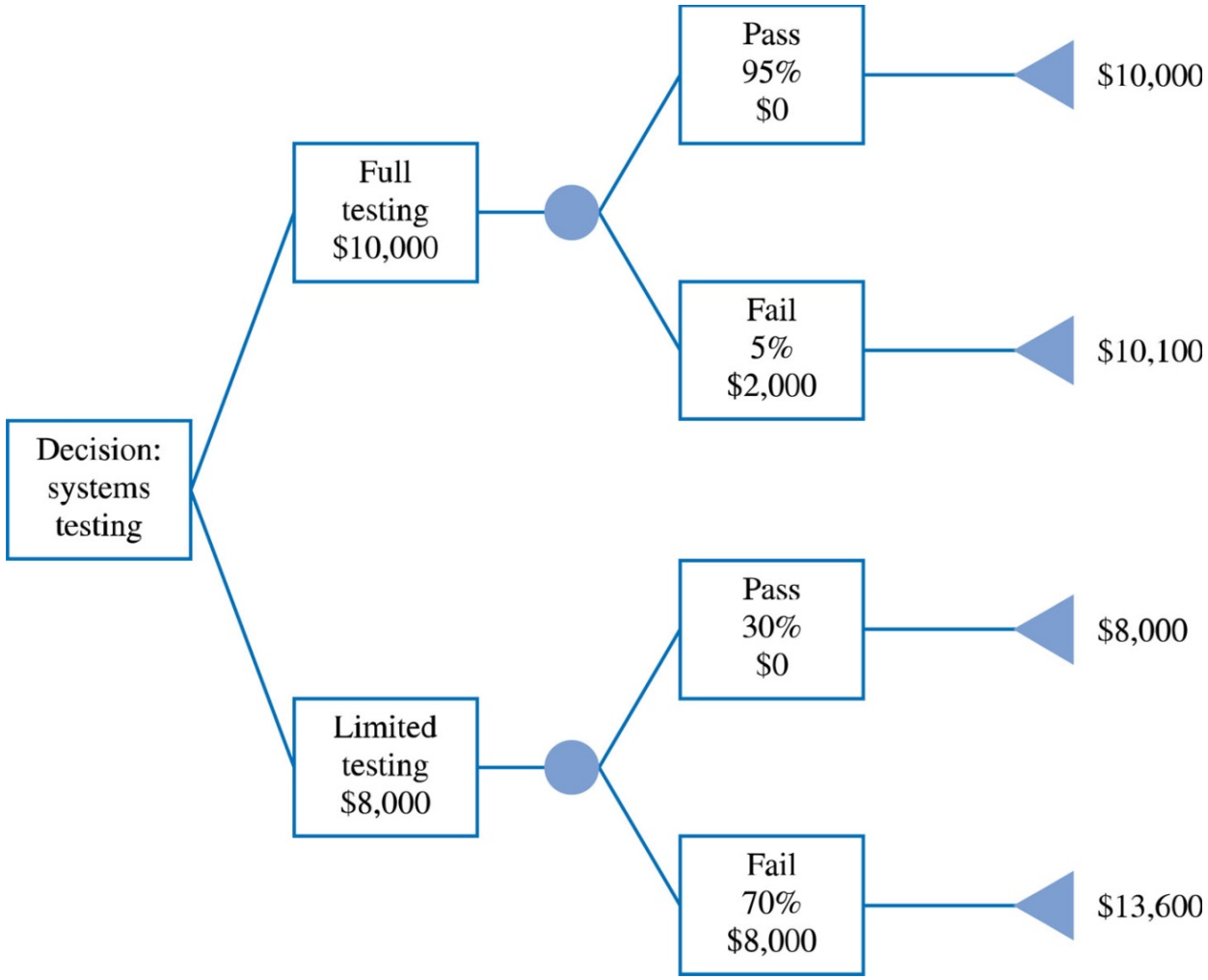
Which risks require a response?

Payoff Table

	A	B	A*B
Schedule Risk	Probability	Payoff (In thousands)	Prob * Payoff (In thousands)
Project completed 20 days early	5%	$ 200	$10
Project completed 10 days early	20%	$ 150	$30
Project completed on Schedule	50%	$ 100	$50
Project completed 10 days late	20%	$ -	$0
Project completed 20 days late	5%	$ (40)	($2)
	100%		$88

The Expected Value

Decision Tree Analysis



STEP 3 – Analyze Risks – Risk Impact Table

Risk (Threats)	0–100% Probability	0–10 Impact	P · I Score
Key project team member leaves project	40%	4	1.6
Client unable to define scope and requirements	50%	6	3.0
Client experiences financial problems	10%	9	0.9
Response time not acceptable to users/client	80%	6	4.8
Technology does not integrate with existing application	60%	7	4.2
Functional manager deflects resources away from project	20%	3	0.6
Client unable to obtain licensing agreements	5%	7	0.4

IT Project Risk Impact Analysis

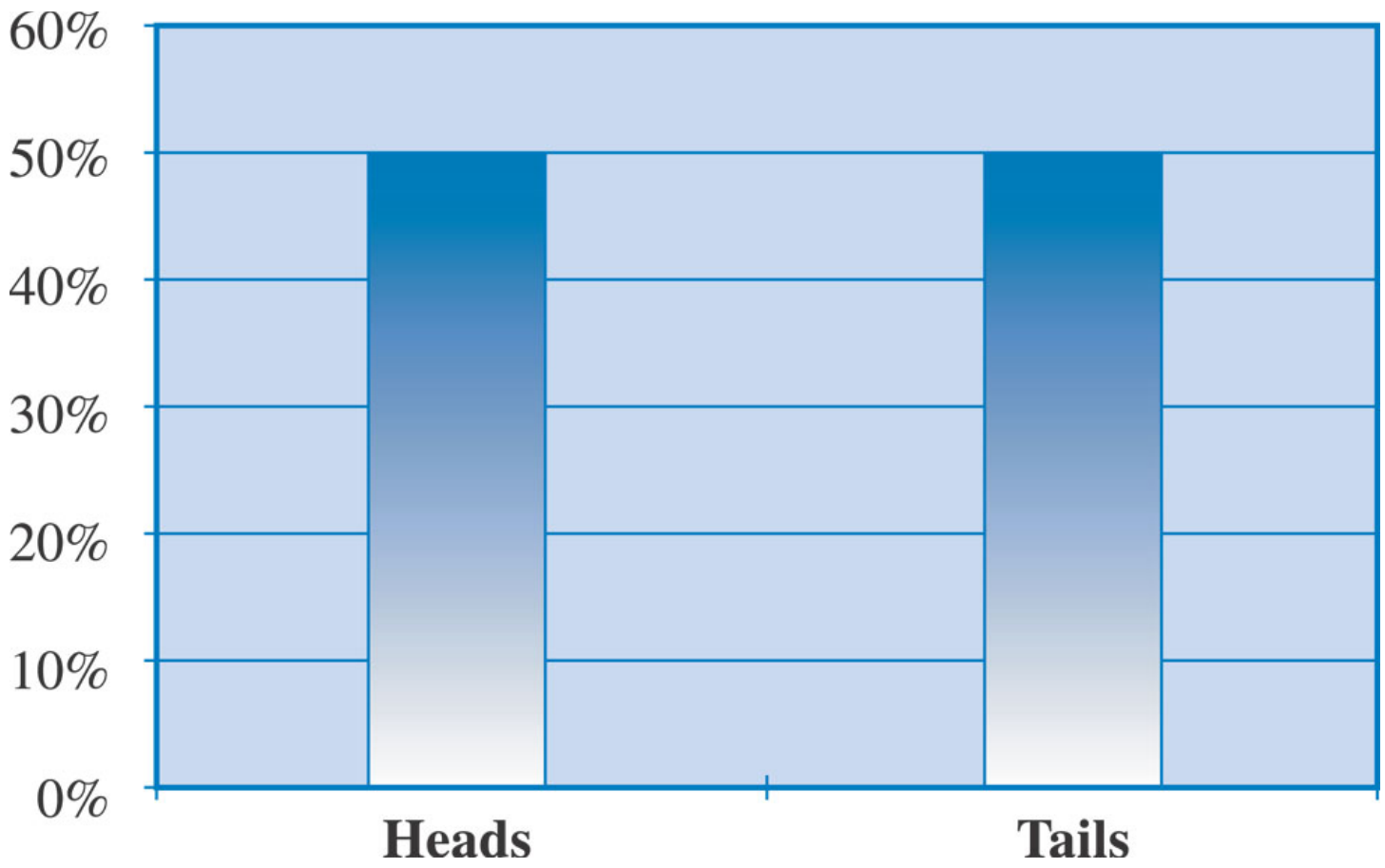
Risk Rankings

Risk (Threats)	Score	Ranking
Response time not acceptable to users/client	4.8	1
Technology does not integrate with existing application	4.2	2
Client unable to define scope and requirements	3.0	3
Key project team member leaves project	1.6	4
Client experiences financial problems	0.9	5
Functional manager deflects resources away from project	0.6	6
Client unable to obtain licensing agreements	0.4	7

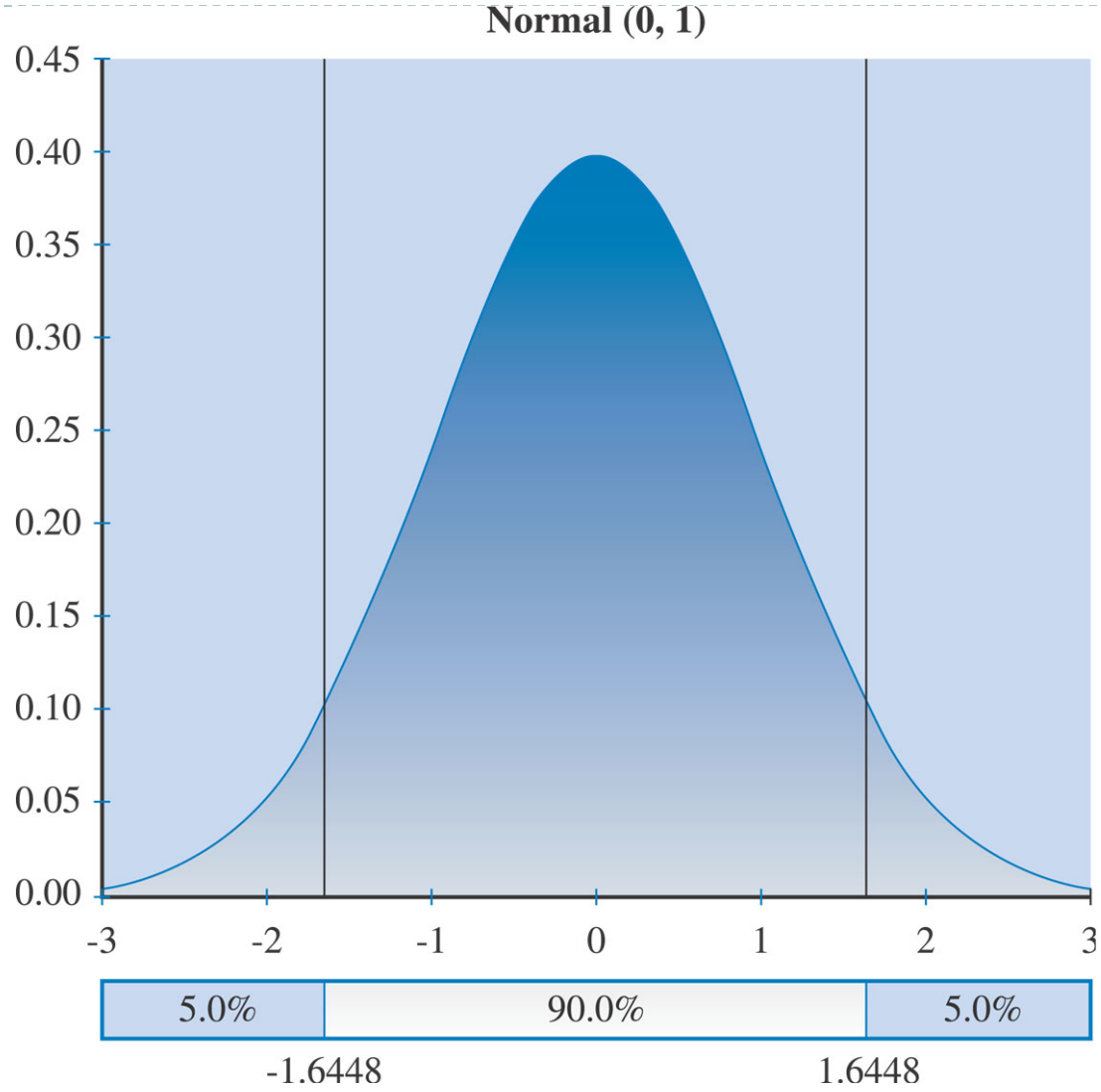
STEP 3 – Analyze Risks
Quantitative Approaches

- **Quantitative** Probability Distributions
  - Discrete
    - Binomial
  - Continuous
    - Normal
    - PERT
    - TRIANG

Binomial Probability Distribution



Normal Distribution



Normal Distribution

- Rules of thumb with respect to observations
- Approximately….

68% $\pm$ 1 standard deviations of mean
95% $\pm$ 2 standard deviations of the mean
99% $\pm$ 3 standard deviations of the mean

PERT Distribution

$$\text{PERT MEAN} = (a + 4b + c)/6$$

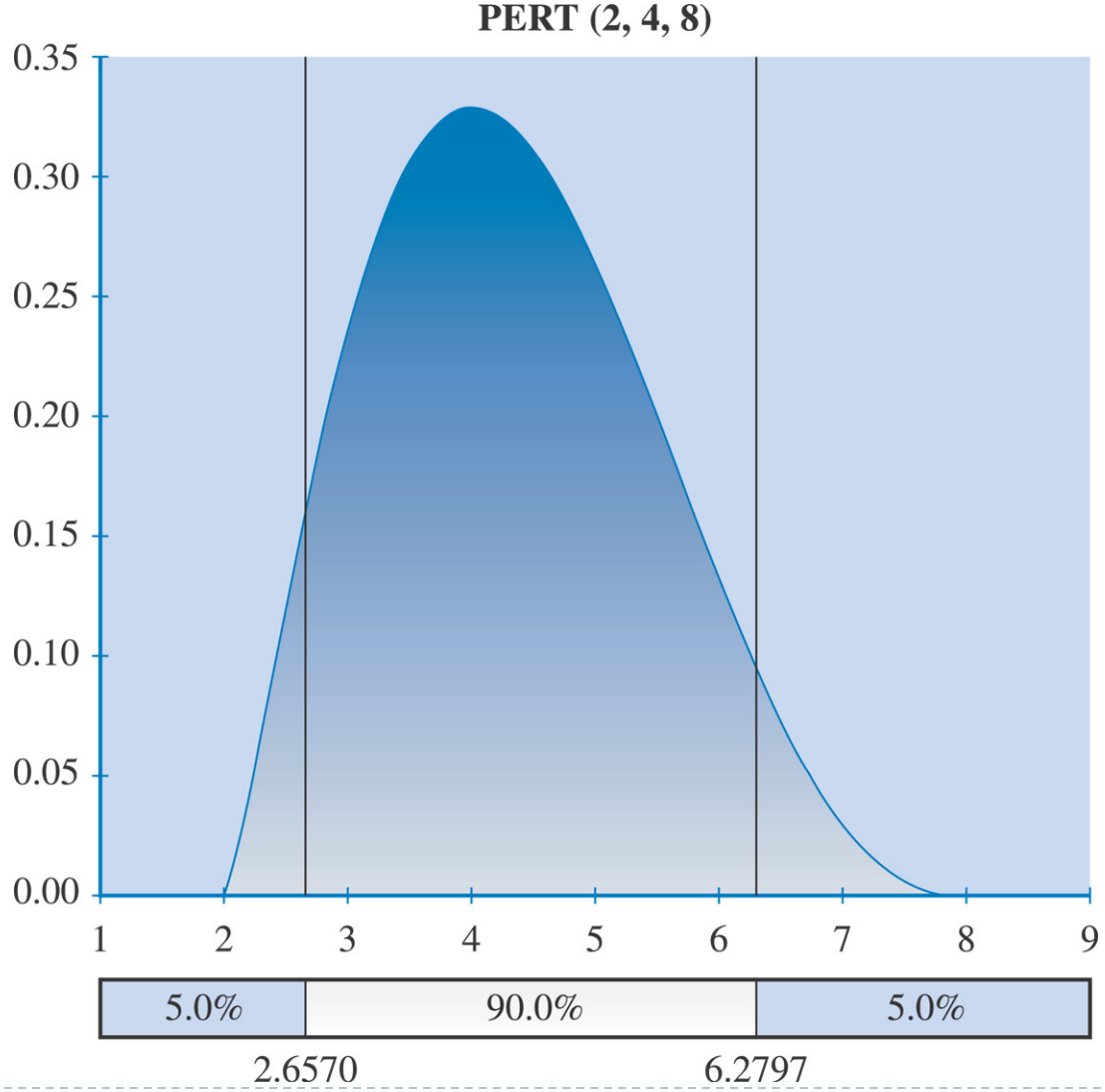
Where:

a = optimistic estimate

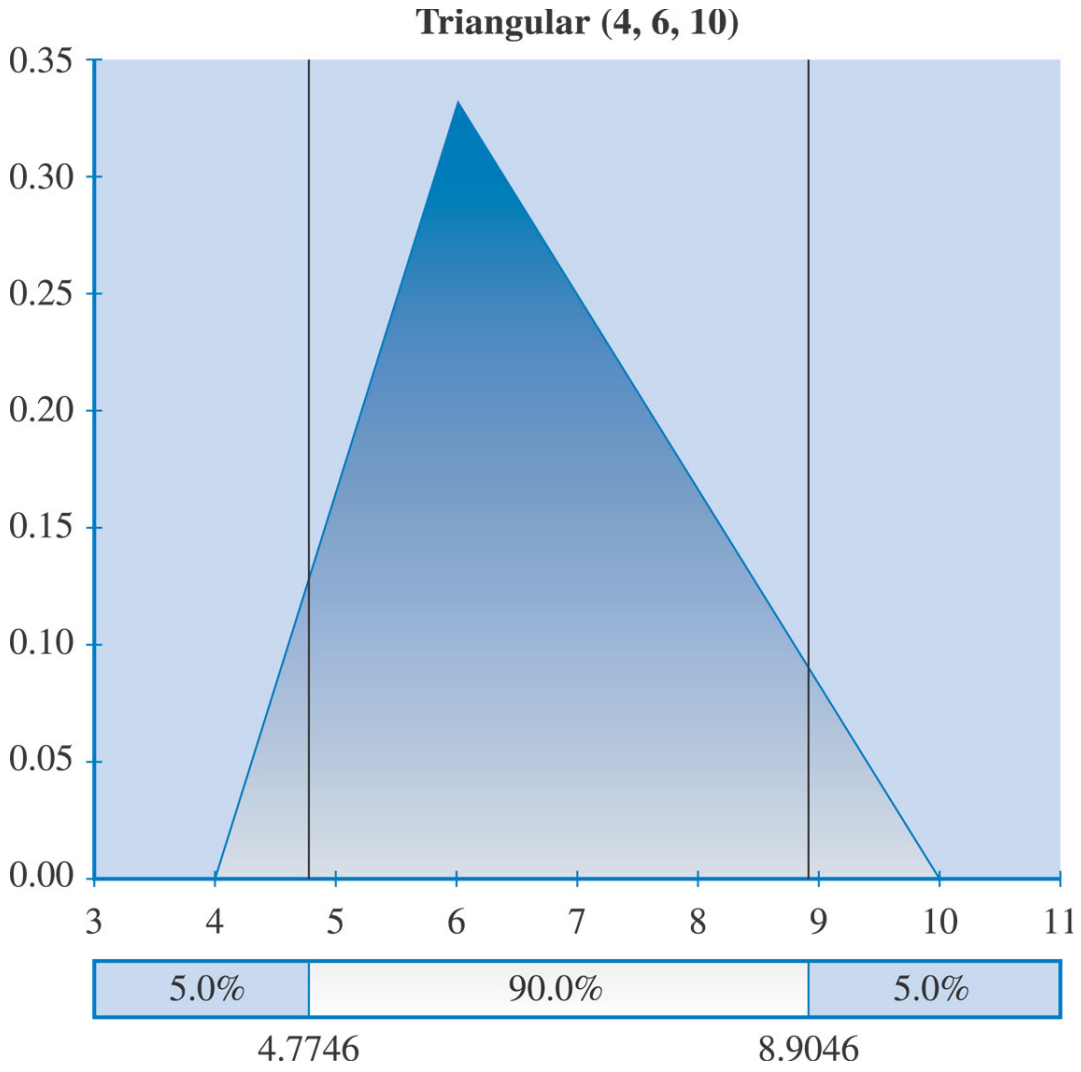
b = most likely

c = pessimistic

PERT Distribution



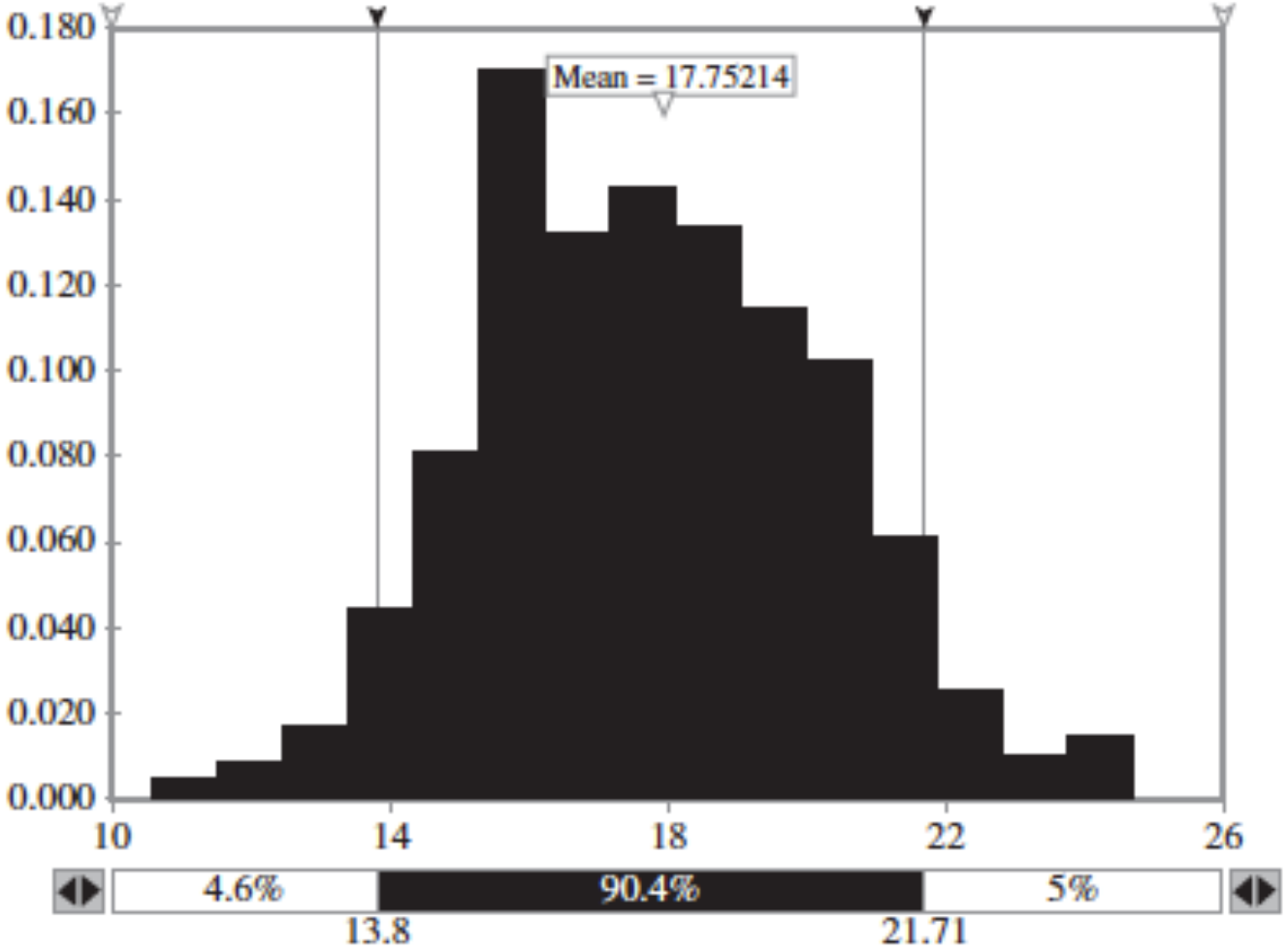
Triangular Distribution



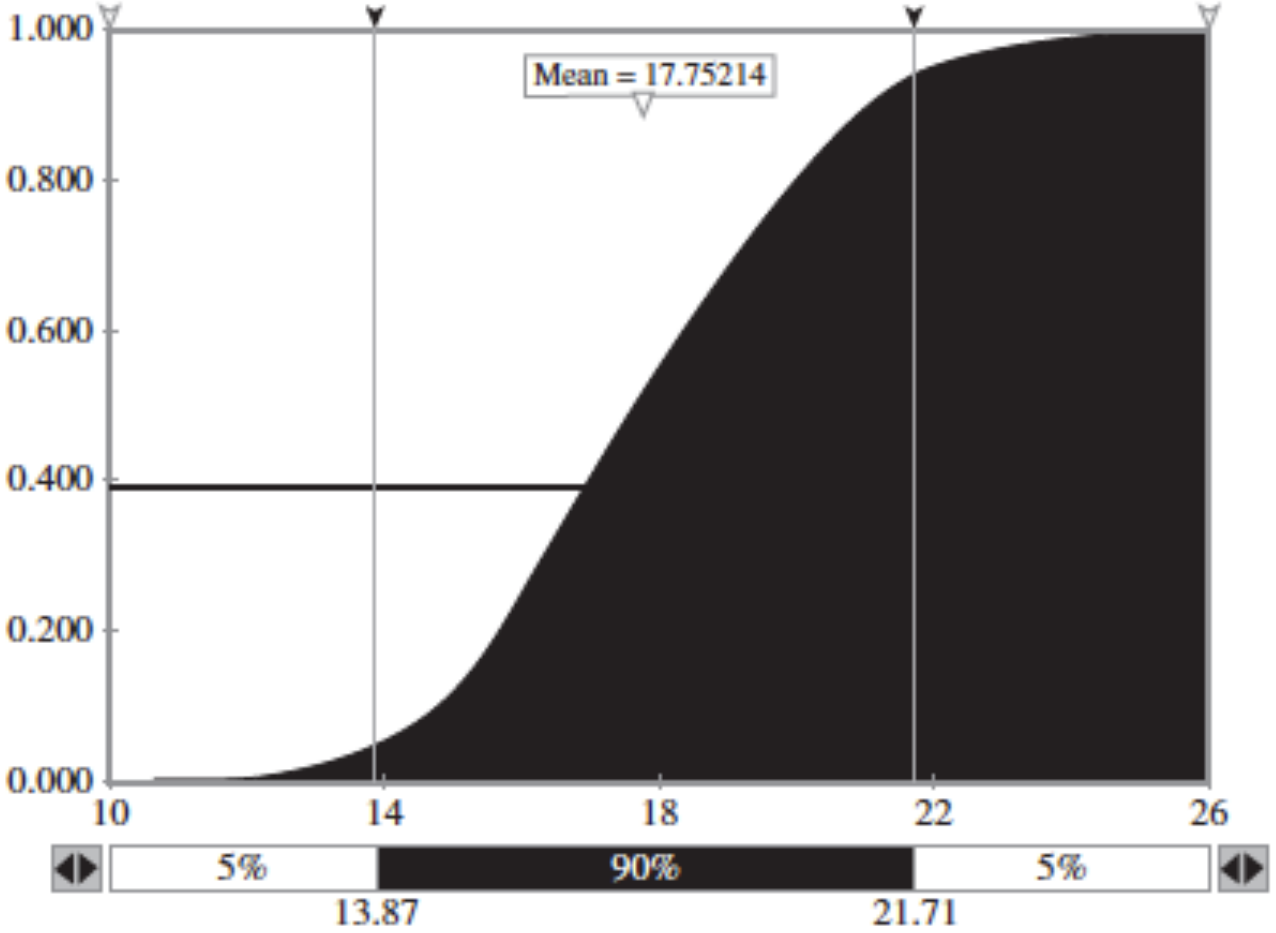
Simulations

- Monte Carlo
  - Technique that randomly generates specific values for a variable with a specific probability distribution
  - Goes through a number of trials or iterations and records the outcome
  - @RISK6®
    - An MS Project® add in that provides a useful tool for conducting risk analysis of your project plan
    - http://www.palisade.com/risk/

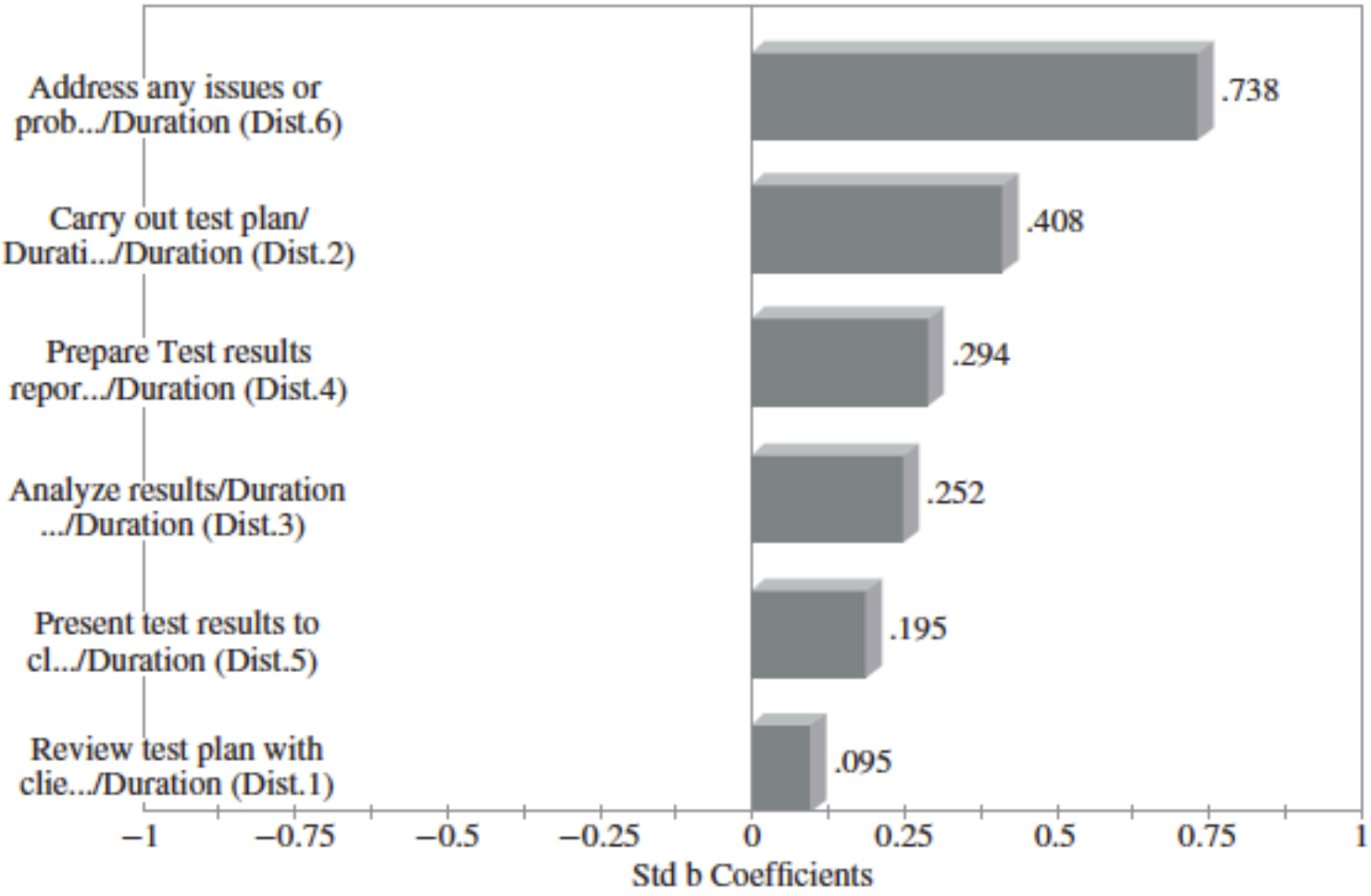
Monte Carlo Simulation



Cumulative Probability Distribution



Sensitivity Analysis Using a Tornado Graph



STEP 4 – Develop Risk Strategies – Risk Strategies Depend On

- The nature of the risk itself
  - Really an opportunity or threat?
- Impact of the risk on the project's MOV and objectives
  - Likelihood? Impact?
- The project's constraints in terms of scope, schedule, budget, and quality requirements
  - Successful response possible with available resources?
- Risk tolerances or preferences of the project stakeholders

STEP 4 – Develop Risk Strategies – Strategies to respond to opportunities with potential positive impacts on the project goal and objectives

- Exploitation – attempt to take advantage of the situation
- Sharing of Ownership – e.g. joint partnerships or joint ventures with customers or vendors
- Acceptance – PM and project team members' minds are open in order to take advantage of opportunities as they arise

STEP 4 – Develop Risk Strategies

- Accept or Ignore
  - Management Reserves
    - Released by senior management
  - Contingency Reserves
    - Part of project's budget
  - Contingency Plans
- Avoidance
- Mitigate
  - Reduce the likelihood or impact (or both)
- Transfer
  - E.g. insurance

STEP 5 – Monitor and Control Risk

- Risk Audits
  - External to project team
- Risk Reviews
  - Internal
- Risk Status Meetings & Reports

STEP 5 – Respond and Evaluate Response to Risk through a Risk Response Plan that includes:

- A trigger which flags that the risk has occurred
- An owner of the risk (i.e., the person or group responsible for monitoring the risk and ensuring that the appropriate risk response is carried out)
- A response based on one of the four basic risk strategies
- Adequate resources

Risk	*Trigger*	*Owner*	*Response*	*Resources required*

STEP 5 – Respond and Evaluate Response to Risk through Risk Evaluation

- Lessons learned and best practices help us to:
  - Increase our understanding of IT project risk in general.
  - Understand what information was available to managing risks and for making risk-related decisions.
  - Understand how and why a particular decision was made.
  - Understand the implications not only of the risks, but also the decisions that were made.
  - Learn from our experience so that others may not have to repeat our mistakes.