

Leveraging Best Practices in Risk Management for Strategic Outcomes

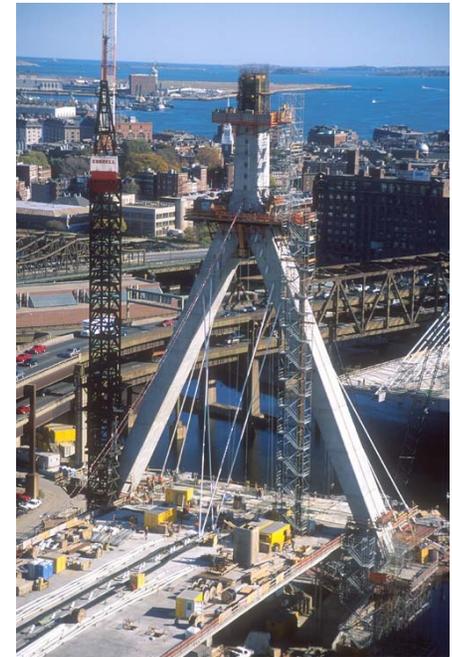
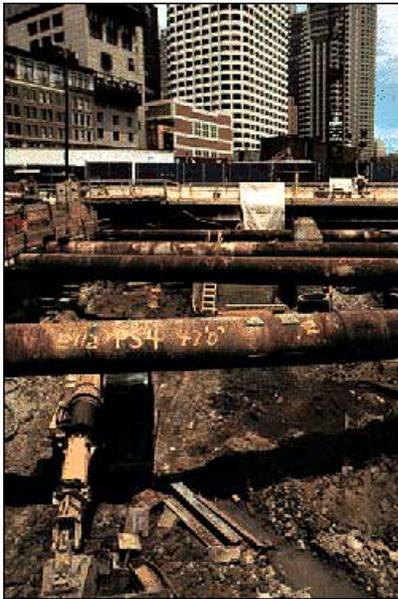


Raed S. Haddad
Senior Vice President
ESI International

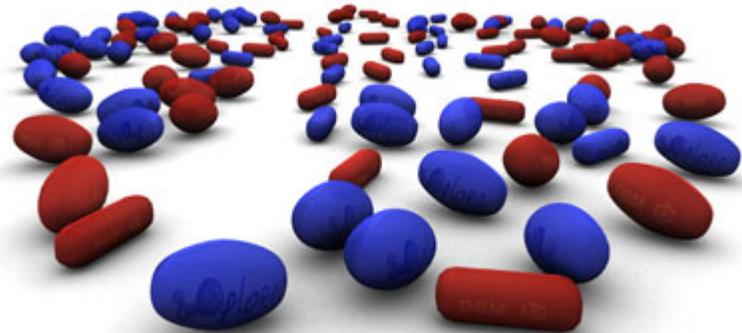
2007 USEPA/USACE SUPERFUND REMEDIATION CONFERENCE



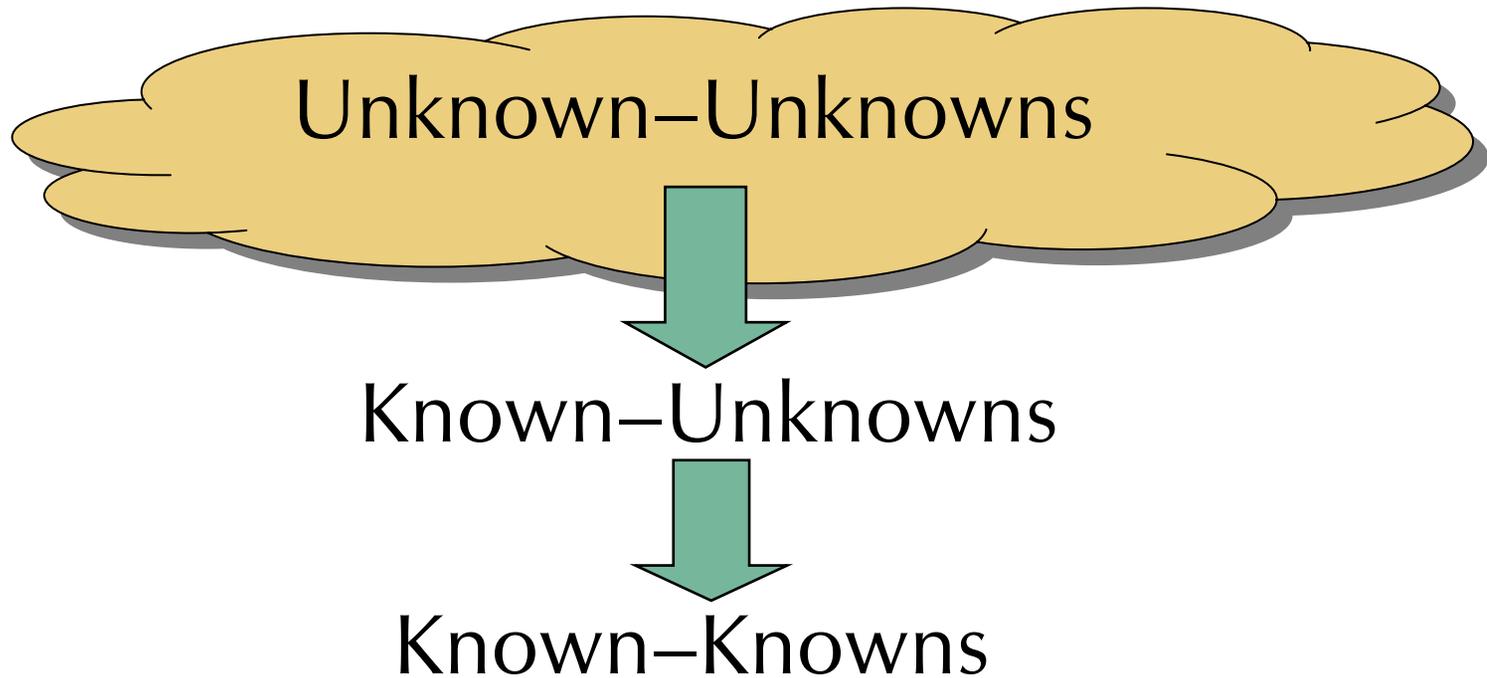
The Big Picture – The Big Dig



The Big Picture -- The Pharma Industry



Uncertainty



Agenda



- Getting a handle on Risk
- Risk management process
- Best practices and lessons learned
 - Identification
 - Qualification & Quantification
 - Response strategies
 - Singing in concert
 - Documentation and feedback loops
- Last thoughts
- Q&A



Polling Question #1

Who is responsible for managing risk on your Project?

1. Technical Leads
2. Project Manager
3. Contractors
4. Government
5. Other



Getting A Handle On Risk

“They couldn’t
hit an elephant
at this dist....”

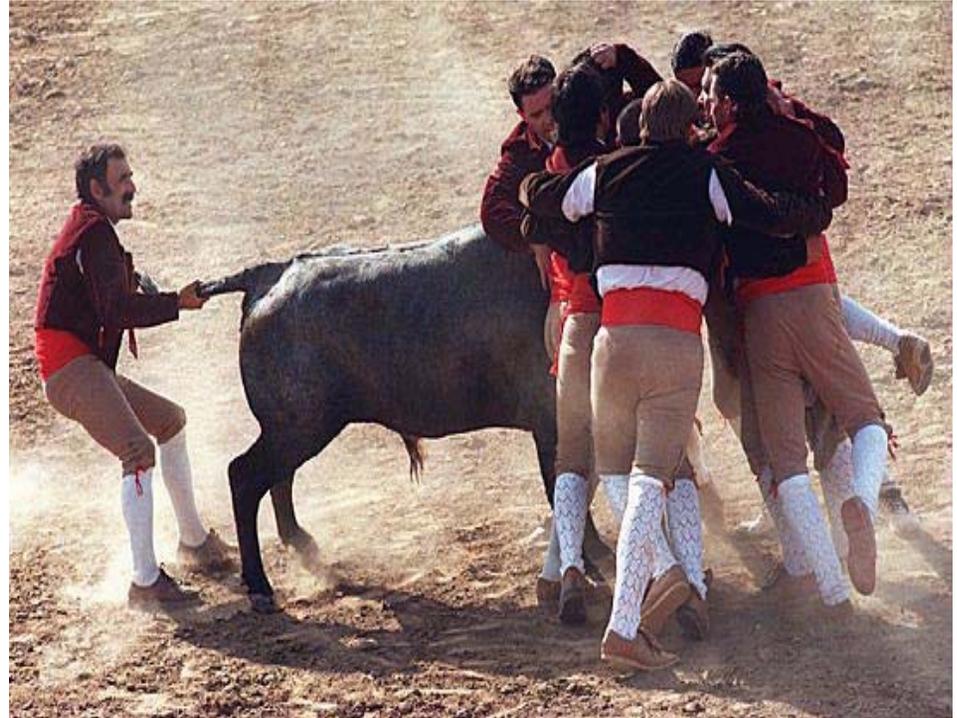
Last Words Of Col. J. Sedgwick



US Army Corps
of Engineers ®

Getting A Handle On Risk

- **Components**
 - Event
 - Probability
 - Impact



Getting A Handle On Risk

- **Characteristics**
 - Situational
 - Interdependent
 - Magnitude-dependant
 - Value based
 - Time based



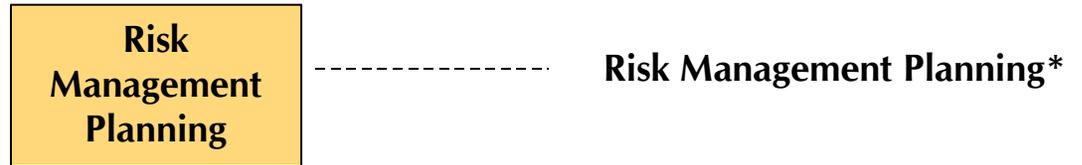
RISK MANAGEMENT

Special Purpose Dexterous Manipulator-SPDM





ESI's Risk Management Model



***PMI® Project Risk Management Processes**

Source: PMBOK® Guide, p. 127

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ESI's Risk Management Model

All project members were involved in a bottoms up approach

- Would the software work
- Is the arm going to be long enough?
- Would the arm be able to support it's own weight on earth during testing?

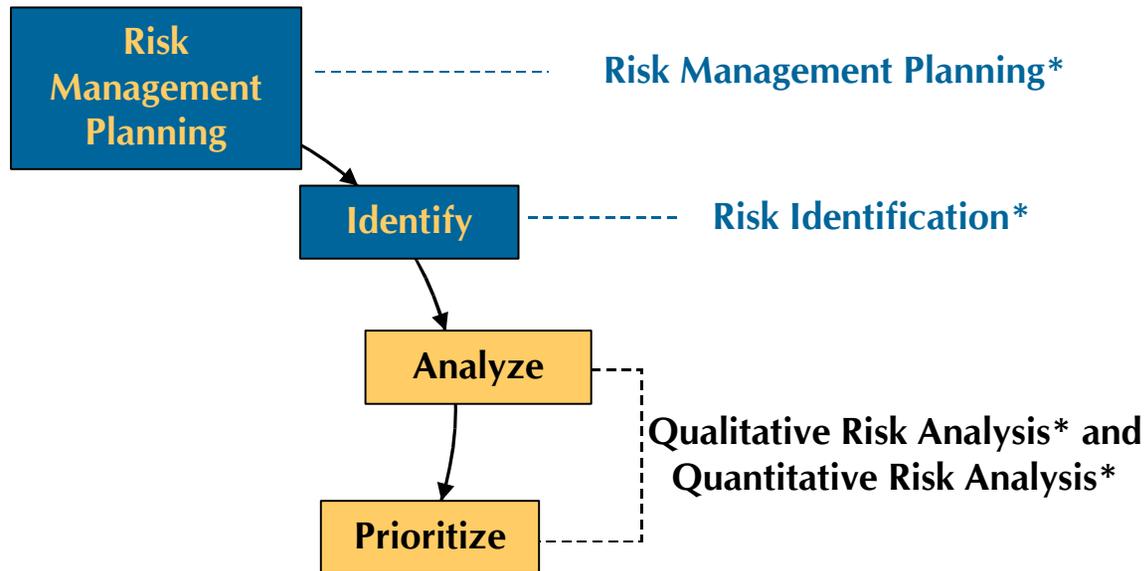


***PMI® Project Risk Management Processes**

Source: PMBOK® Guide, p. 127



ESI's Risk Management Model

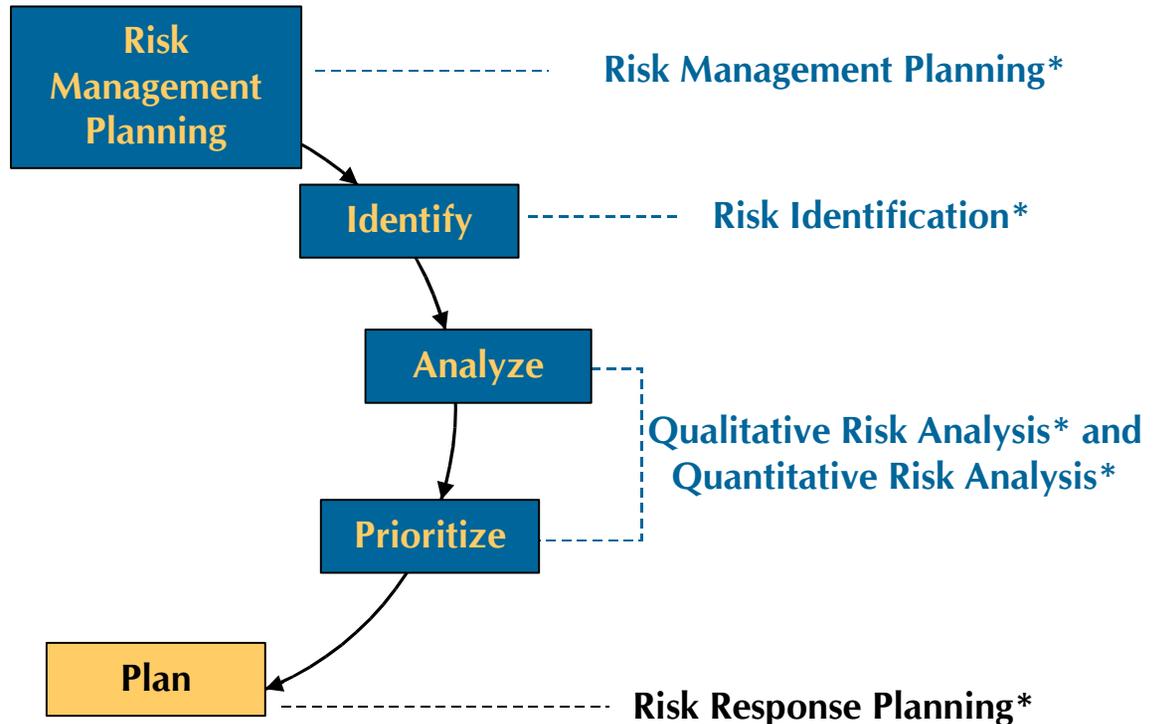


***PMI® Project Risk Management Processes**

Source: PMBOK® Guide, p. 127



ESI's Risk Management Model

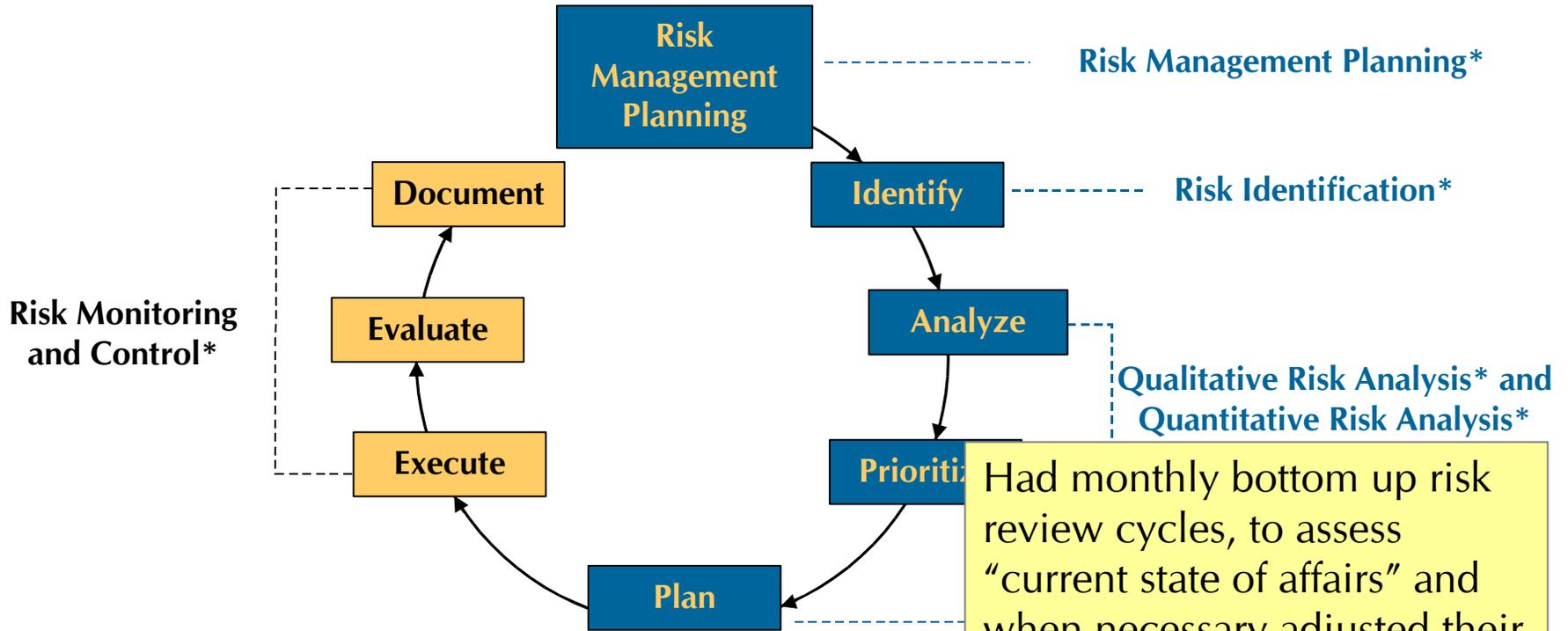


***PMI® Project Risk Management Processes**

Source: PMBOK® Guide, p. 127



ESI's Risk Management Model



Had monthly bottom up risk review cycles, to assess "current state of affairs" and when necessary adjusted their risk plan according to what they had laid out in previous steps of their risk model..

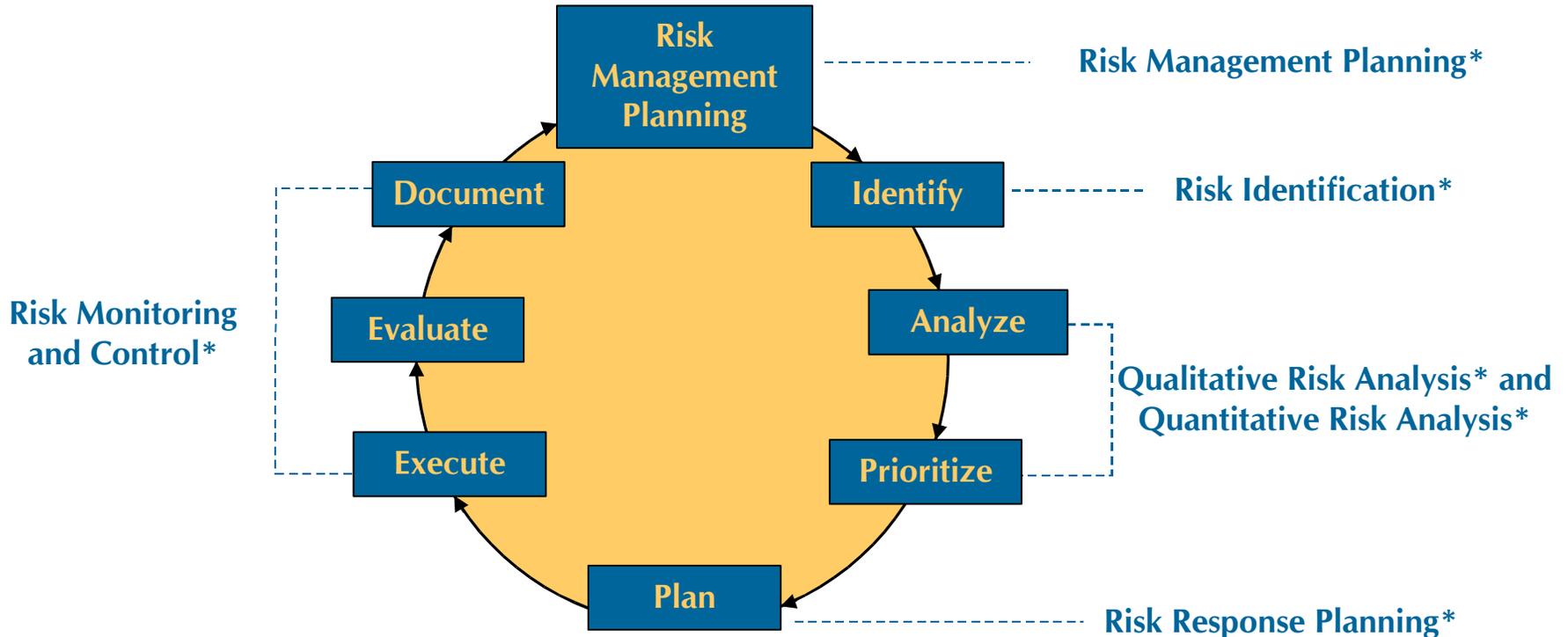
*PMI® Project Risk Management Processes

Source: PMBOK® Guide, p. 127





ESI's Risk Management Model



***PMI® Project Risk Management Processes**

Source: PMBOK® Guide, p. 127

Who Else Thinks This Is a Good Idea



i n v e n t



Identification

- Inherent to any project
- Crawford slip technique
- Interview experts
- Brainstorming
- Affinity diagrams
- Key risk categories
- Early identification tool



Category Examples

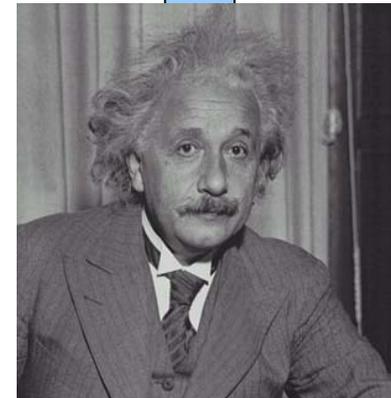
- External Risks
 - Unpredictable
 - Regulatory
 - Natural Hazards
 - Environmental
 - Predictable (but uncertain)
 - Market changes
 - Currency changes
 - Inflation
 - Taxation
- Internal Risks
 - Schedule
 - Realism
 - Availability
 - Requirements
 - Technical
 - Technological maturity
 - Complexity
 - Customization
 - Legal
 - Licensing
 - Contract ambiguity
 - Lawsuits
 - Financial
 - Competition
 - Strategy
 - Contract type

Qualification And Quantification

- Our biases
- How high is high?
- Address probability and impact
- Strive to establish common values
- Dependent on the environment

100%	Probable	High probability	Very high	100%
			High	85%
	Improbable	Medium probability	Medium	65%
50%				35%
		Low probability	Low	15%
0%			Very low	0%

Virtual Certainty



Distinct Possibility



Response Strategies

- Avoid
- Retain
- Mitigate
- Transfer
- List three strategies for every risk
- Walk on the wild side
- Present options to get buy-in





Singing in Concert: Preparing for Risks

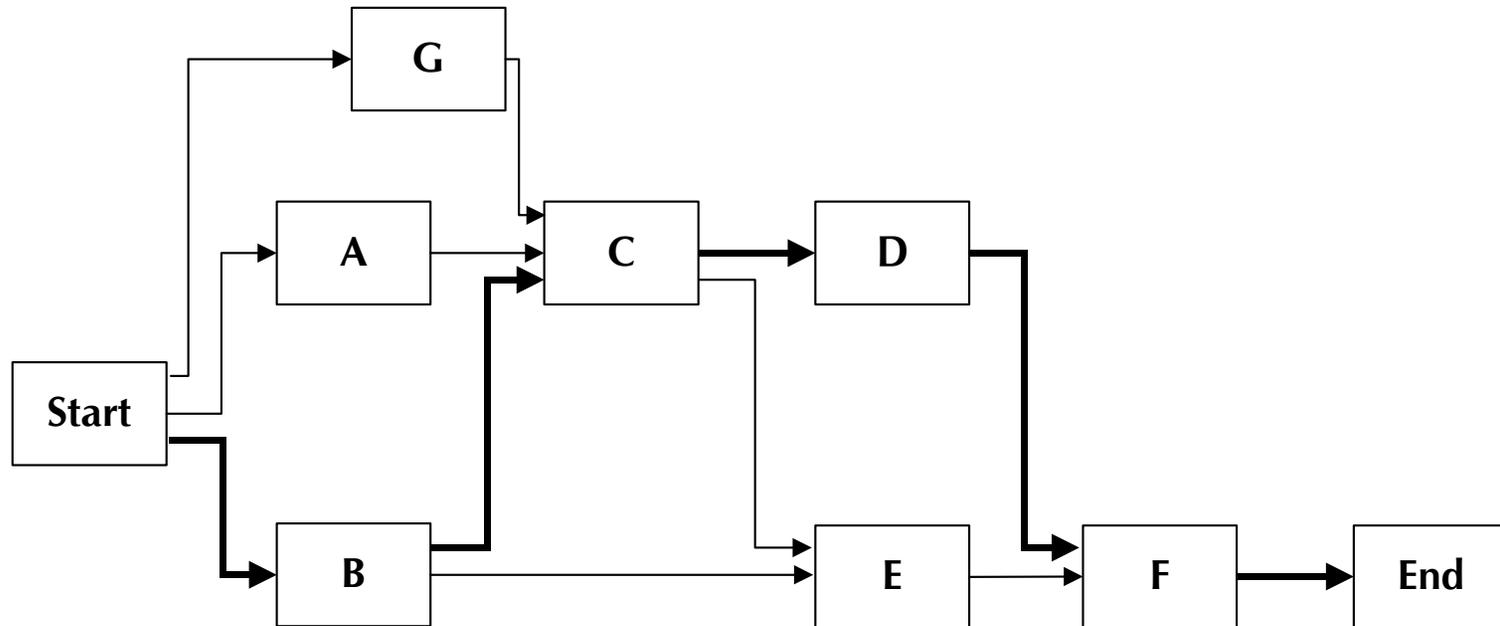
Category	WBS #	Risk Event (O=Opportunity; T=Threat)	Impact	Probability	Expected Value	Priority Rating	Risk Response Plan	
	1.2.1	Structural Integrity of building will be compromised	H	M	HM	1		



Singing in Concert: Preparing for Risks

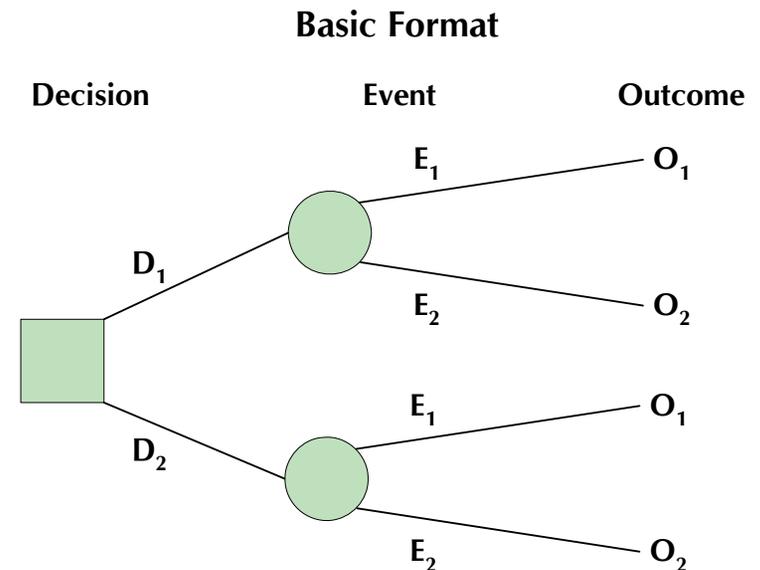
Category	WBS #	Risk Event (O=Opportunity; T=Threat)	Impact	Probability	Expected Value	Priority Rating	Risk Response Plan	Triggers
	1.2.1	Structural Integrity of building will be compromised	H	M	HM	1		

Analyzing Schedule Risks

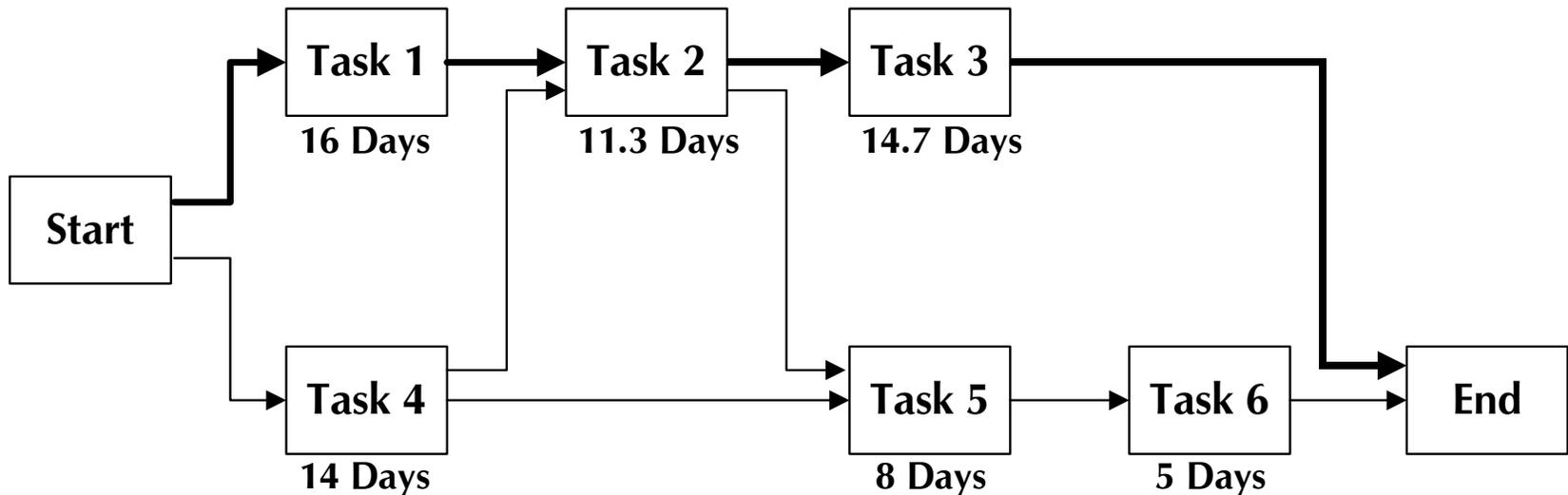


Tools and Techniques for Risk Analysis

- Expert judgment
- Expected value
- Decision trees
- Statistical sums
 - Program Evaluation and Review Technique (PERT)
- Computer simulation
 - Monte Carlo



PERT—One of the More Significant Statistical Sums Used in Risk Analysis

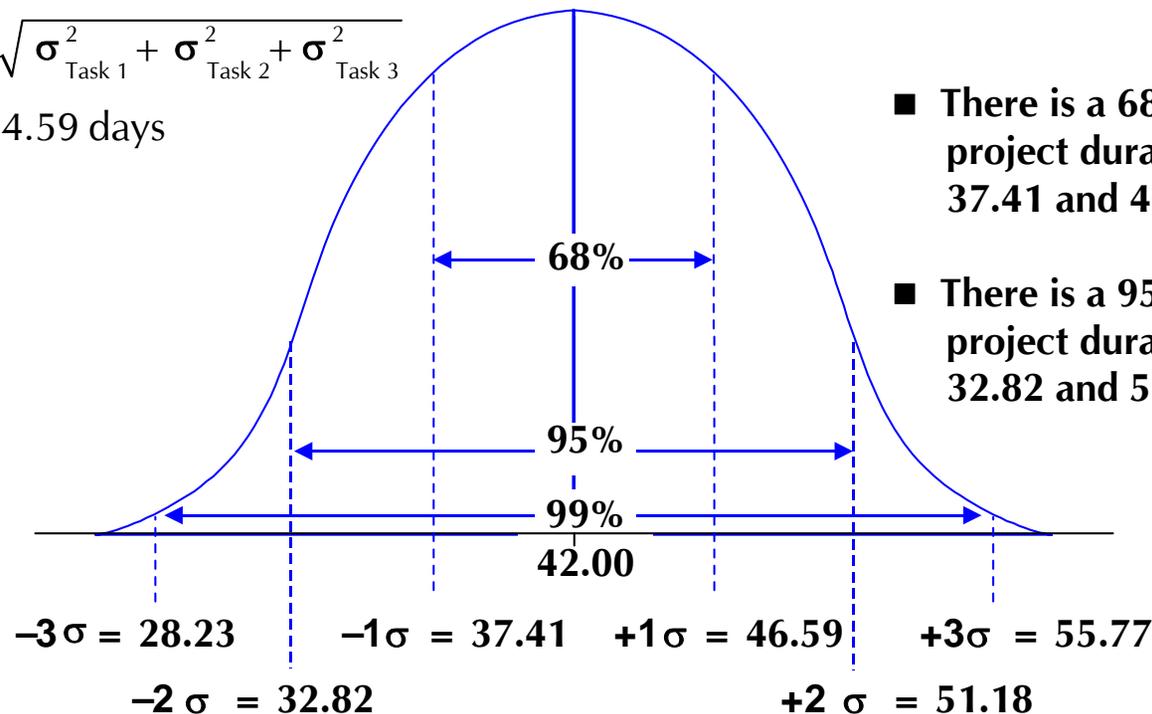


PERT Example for Schedule Duration Final Results

Expected project duration = 42 days = Mean = Expected critical path

$$\sigma = \sqrt{\sigma_{\text{Task 1}}^2 + \sigma_{\text{Task 2}}^2 + \sigma_{\text{Task 3}}^2}$$

$$\sigma = 4.59 \text{ days}$$

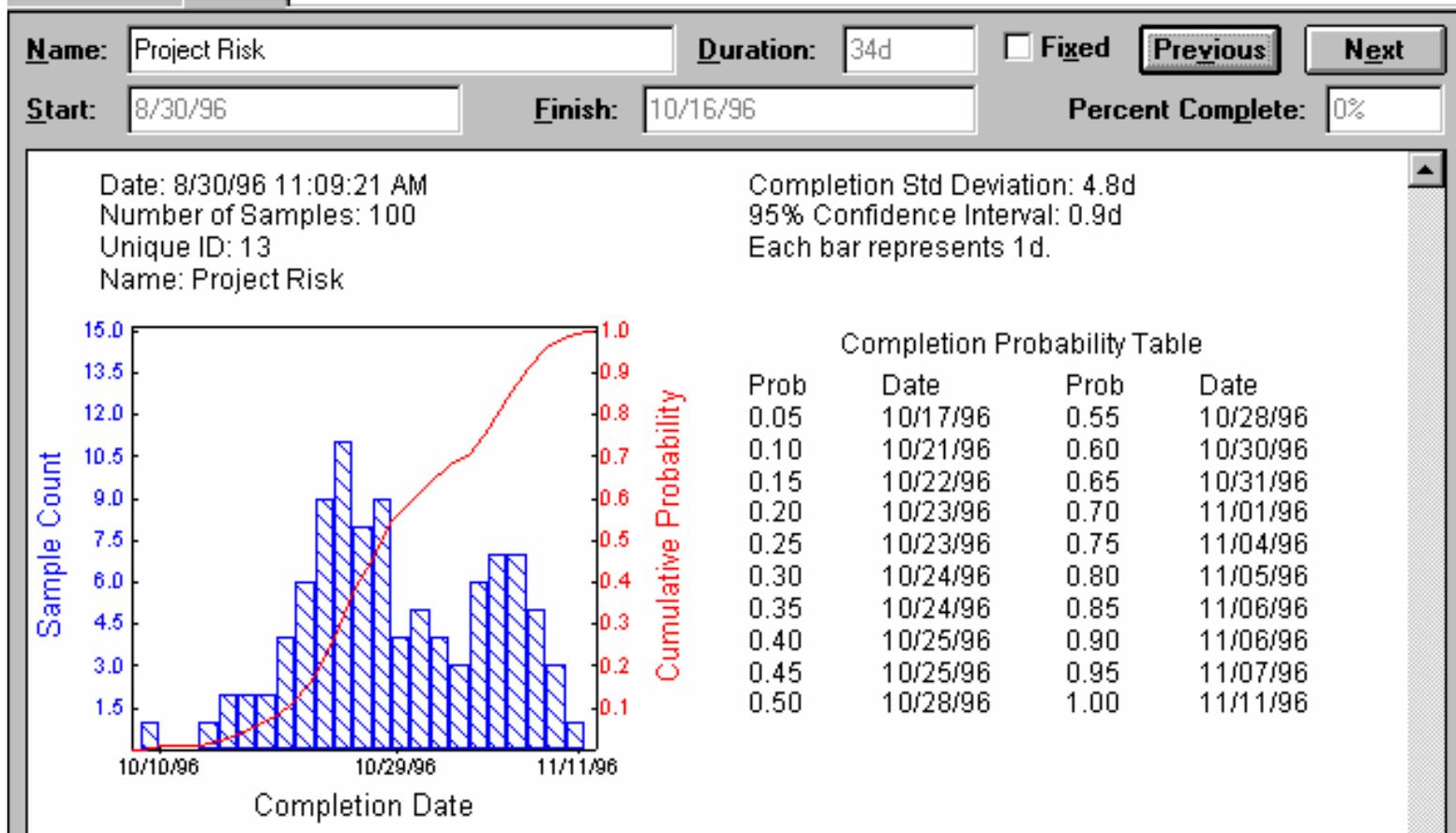


- There is a 68% chance that the actual project duration will be between 37.41 and 46.59 days
- There is a 95% chance that the actual project duration will be between 32.82 and 51.18 days

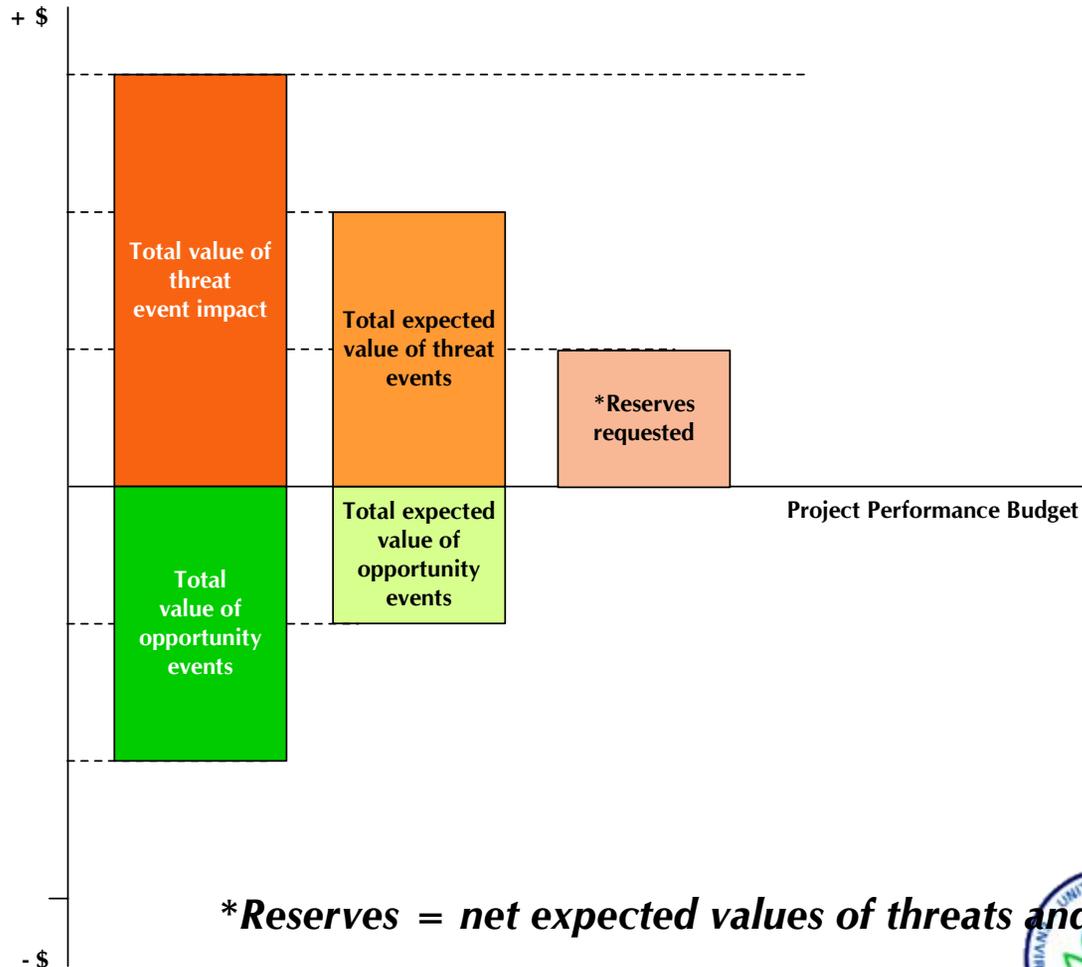
Monte Carlo Simulation in Risk Analysis

- A computer analysis of the project using the network diagram and probability distributions of duration or cost to determine all possible project outcomes
 - Can be used for project costs or project durations
 - Requires specialized software to conduct the simulation
 - Can be used on large or complex projects of any type
 - Allows for analysis of path convergence interdependencies (which statistical summing techniques such as PERT do not)

Sample: Monte Carlo Critical Path Analysis (continued)



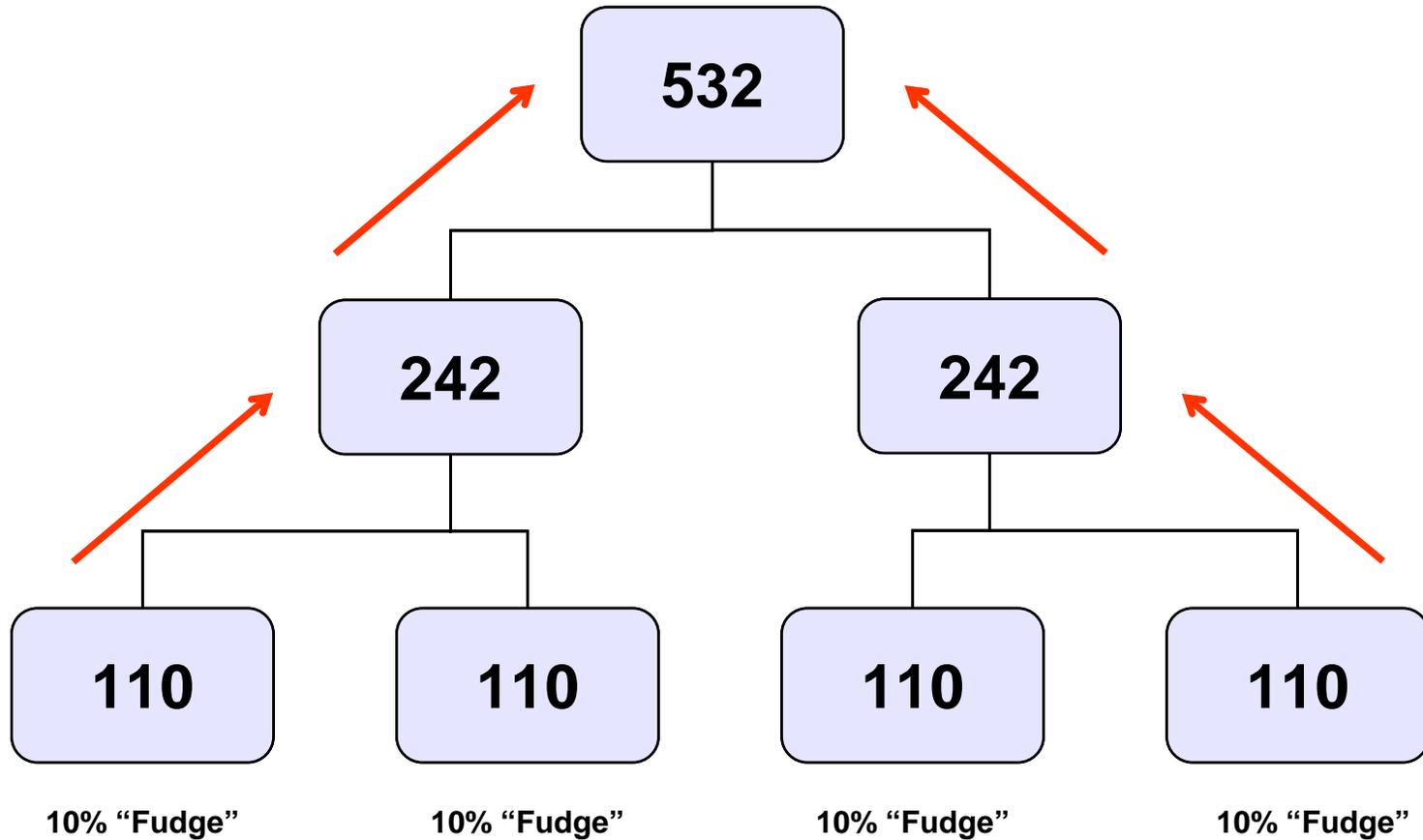
Putting Reserves in Perspective Helps with Final Budgeting Decision



***Reserves = net expected values of threats and opportunities**

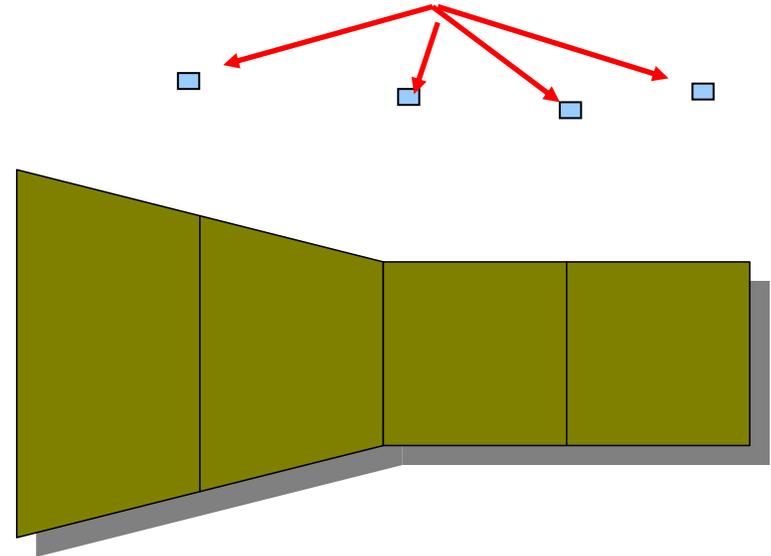


Exponential Fudge Factor



Singing in Concert: Integrating Project Roles

- Validity
- Intended use
- Tie to corporate strategy
- IRR, NPV, Cash flow, hurdle rate, capex, capital, etc.
- Top risks
- Range of outcomes





Station Break

- Getting a handle on Risk
- Risk management process
- Best practices and lessons learned
 - Identification
 - Qualification & Quantification
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 - Singing in concert
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- Last thoughts
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“One definition of insanity is doing the same thing over and over and expect a different result”

Archiving And Lessons Learned



- Where are your lessons learned?
- Text fields



WBS	Task Name	Risk Event	Probability	Impact	Strategy	Owner	Outcome
1.1.2.1		Text7	Number3	Text8	Text9	Text28	Text 29

Top 5 Nuggets

- Establish Baselines
 - Knowledge & skills
 - Competencies
- Building the case for your opinion
- Risk based status meetings
- Don't be a boiling frog
- Know the Law of first Knowledge

blink!
don't be a
boiling
frog



Questions?

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