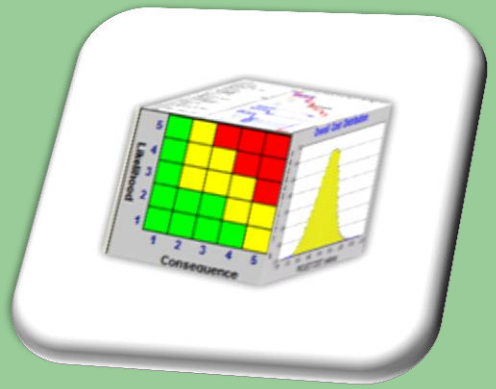
SCHEDULE RISK ANALYSIS ESSENTIALS FOR PROJECT SUCCESS



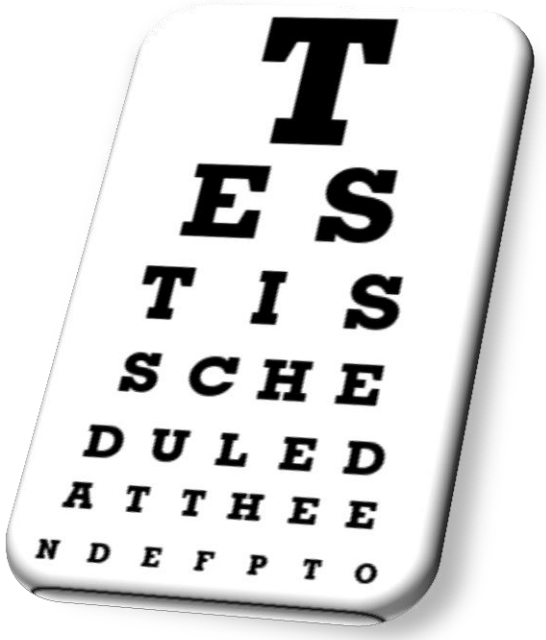
CSVA 2011 Conference
Toronto, Ontario

Nov 14 -16, 2011

Laszlo A. Retfalvi P.Eng PMP PMI-RMP
Retfalvi and Associates

Agenda of Session

- Key Take Aways
- Background
- Understanding the Basics
- The Need for Schedule Risk Analysis
- Uncertainty
- Schedule Risk Analysis
- Critical Success Factors
- Cost Risk Analysis
- Review of Key Take Aways
- Summary
- Contact Information



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Key Take Aways

- Understand project risk management basics
- Probability of successful implementation of deterministic project schedules is low
- Activity durations are uncertain and best represented as probability distributions
- Project planning must always include risk simulation to produce reliable results
- Address the critical success factors that impede success
- *Focus on what is important*
  - *Not what is easy*

Background

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SCAV
CSVA

Background

Hulett & Associates

PROJECT RISK REMINDER

HELPING ORGANIZATIONS SUCCEED

Retfalvi AND ASSOCIATES

www.projectrisk.com www.retfalviandassociates.com

Risk Planning

Main objectives:

- Develop overall risk management strategy for the project
- Identify how risk management activities are integrated into the project

Tools:

Planning sessions Templates Executive Project Summary Lessons Learned

Key success criteria:

ptance and support by stakeholders Balance of effort/cost and benefit

ider opportunities, not only threats Forward looking

Management Plan Better understanding of the project Improved criteria for project success

ification

tives:

ify risks from many sources that may impact

Breakdown Structure Risk Interviews an

criteria:

orate culture that is "risk aware" and wants t

cting unbiased data from project participants

because you cannot do anything about it does

pecial attention to identifying opportunities.

f potential risks to the project's objectives, s

izational and project management.

isks are stated in the form of the structured ri

e Risk Analysis

tives:

itize the identified risks for their importance

lop definitions for the 5X5 probability and in

ct definitions are specified for each objective

isk interviews to calibrate the risks by their p

ct objectives, employing the definitions the s

gement also determines classes of probabilit

w importance to each objective.

criteria:

ct management contributes to the developme

probability and impact matrix.

iewees are selected to capture relevant know

iewees are provided confidentiality for their

prioritized as to their importance to each pr

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Project Scheduling and Schedule Risk Analysis
2 Day 14 PDUs

Training Outline:

As projects increase in complexity and schedules become more aggressive and complex, the ability to understand key project scheduling and scheduling risk analysis techniques significantly improves the chances of successful project execution.

This information packed 2 day session provides an overview of proven processes, tools and techniques required to implement a proper project schedule to aid in delivering a successful project. The session also highlights the benefits of schedule risk analysis as a powerful technique to increase the probability of project success and includes a demonstration of schedule and cost risk analysis software to review the concepts discussed. This course covers the Time Management knowledge area and the Quantitative Schedule Risk Analysis process of the Risk Management knowledge areas of the PMBOK® Guide.

Benefit to you:

Attendees will learn a solid overview of proven project scheduling and schedule risk analysis knowledge, techniques, and tools in this session. The core concepts and knowledge learned is complimentary and of benefit to PMI® PMBOK® Guide and PMI® Practice Standard for Project Risk Management practitioners.

What you will learn:

Attendees will:

- Learn the principles of project scheduling, from simple forward pass and early dates to advanced use of constraints, resources, calendars, statusing, baseline control and earned value.
- Learn the methods of schedule problem diagnoses and discover scheduling abuses to avoid.
- Learn the concepts of project schedule risk analysis from simple Monte Carlo simulation to more advanced techniques (e.g., correlation, probabilistic branching and conditional branching)
- Review the issues and techniques for collecting high-q

Handouts:

Attendees will receive a handy package for future referen

Who should attend:

Subject-matter experts from any field who contribute to p for projects, risk managers, PMOs, senior technical leads analysts, and experienced project managers looking to re scheduling and schedule risk analysis tips, tools, techniq

Instructor

David T. Hulett, Ph.D.
Principal - Hulett & Associates LLC
www.projectrisk.com

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Practical Project Risk Analysis and Management
1 Day 7 PDUs

Training Outline:

As projects increase in complexity and schedules become more aggressive, the ability to proactively distinguish and integrate the management of key or emergent risks within a project significantly improves the chances of successful project execution and organizational success.

The ability to link these to performance parameters increases cost and schedule confidence, reducing exposure to unnecessary delays, negative financial impacts, and potential damage to an organization's reputation.

This information packed summary session provides an overview of proven processes, tools and techniques required to implement a practical project risk management framework to aid in delivering successful projects that meet stakeholder needs. The session also includes a demonstration of schedule and cost risk analysis software to review the concepts discussed.

Benefit to you:

Attendees will learn a solid overview of proven project risk management knowledge, techniques, and tools in this session. Aligned with the PMI® *PMBOK*® Guide and PMI® Practice Standard for Project Risk Management, the core concepts and knowledge learned is also complimentary and of benefit to PRINCE2®, COBIT®, ITIL®, and BABOK® practitioners. The session is also useful for users of Agile project management principles and methodologies.

risk mitiga
quantitati
t the Risk I

PARTNI

(4th ed.) processes of project risk management.
industry risk management guidance documents.
method to effectively communicate projects to stakeholders.
quirements and basic CPM scheduling.
isk management planning, employing both opportunities and
eakdown structure in risk identification.
ls to prioritize risks and prepare appropriate risk responses.
is methods of schedule and cost risk analysis.
r/risk log as a critical tool for project and risk management.
nagement lessons learned.
s of the mature project risk management organization and
nplementation of successful project risk management.

e reference and a handy quick reference ***Risk Reminder***.

ct-matter experts from any field who contribute to projects,
jects, risk managers, PMOs, senior technical leads, project
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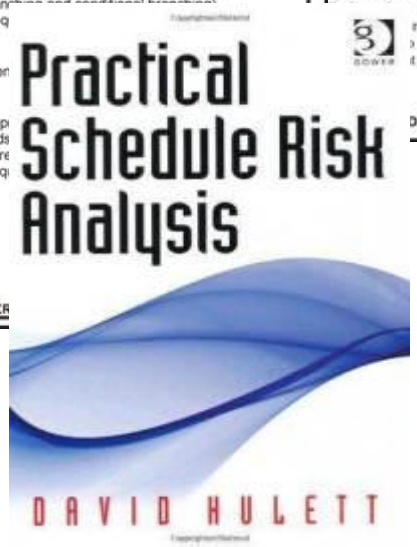
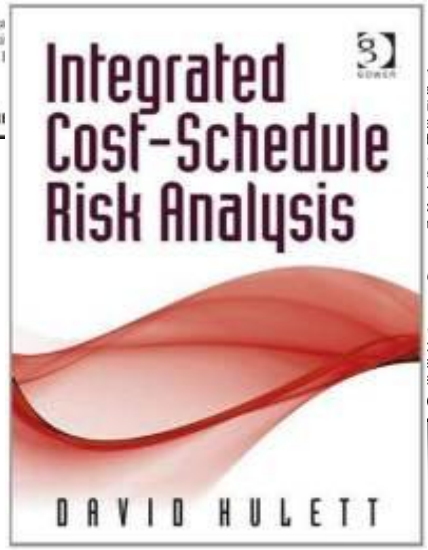
VIDING EXPERIENCED SUPPORT AND ADVICE





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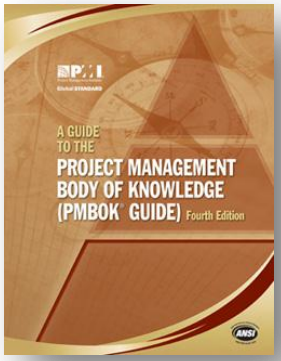
Understand The Basics

- Risk is generally viewed as a state of uncertainty where some possible outcomes have an undesired effect or significant loss.
- A more appropriate definition of a project risk is an uncertain event or condition that, if it occurs, has a *positive* or *negative* effect on project objectives.
  - Opportunity
  - Threat
- It is important that the project manager be knowledgeable and *fully versed* on project risk management principles, concepts, and processes.



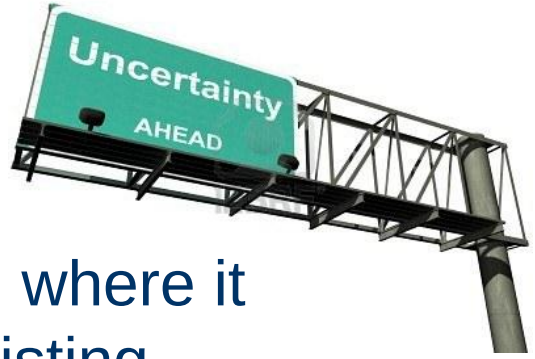
The Risk Circle of Life

The Need for Schedule Risk Analysis

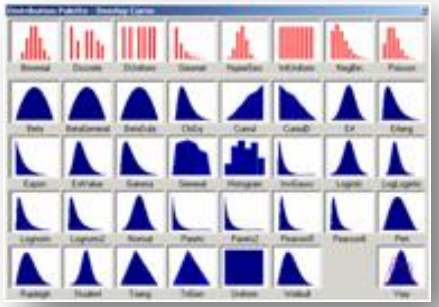
- Most Project Managers assume that if the best estimates are used in their CPM schedules, the completion date is the most likely date.
  - This is not correct
- Schedule Risk Analysis
  - *Addresses head on* the fact that we do not know how long activities will take
  - Allows investigation of uncertainty in activity durations and *determine their implications to the project schedule*

Project planning must always include risk simulation to produce reliable results.

Activity Uncertainty

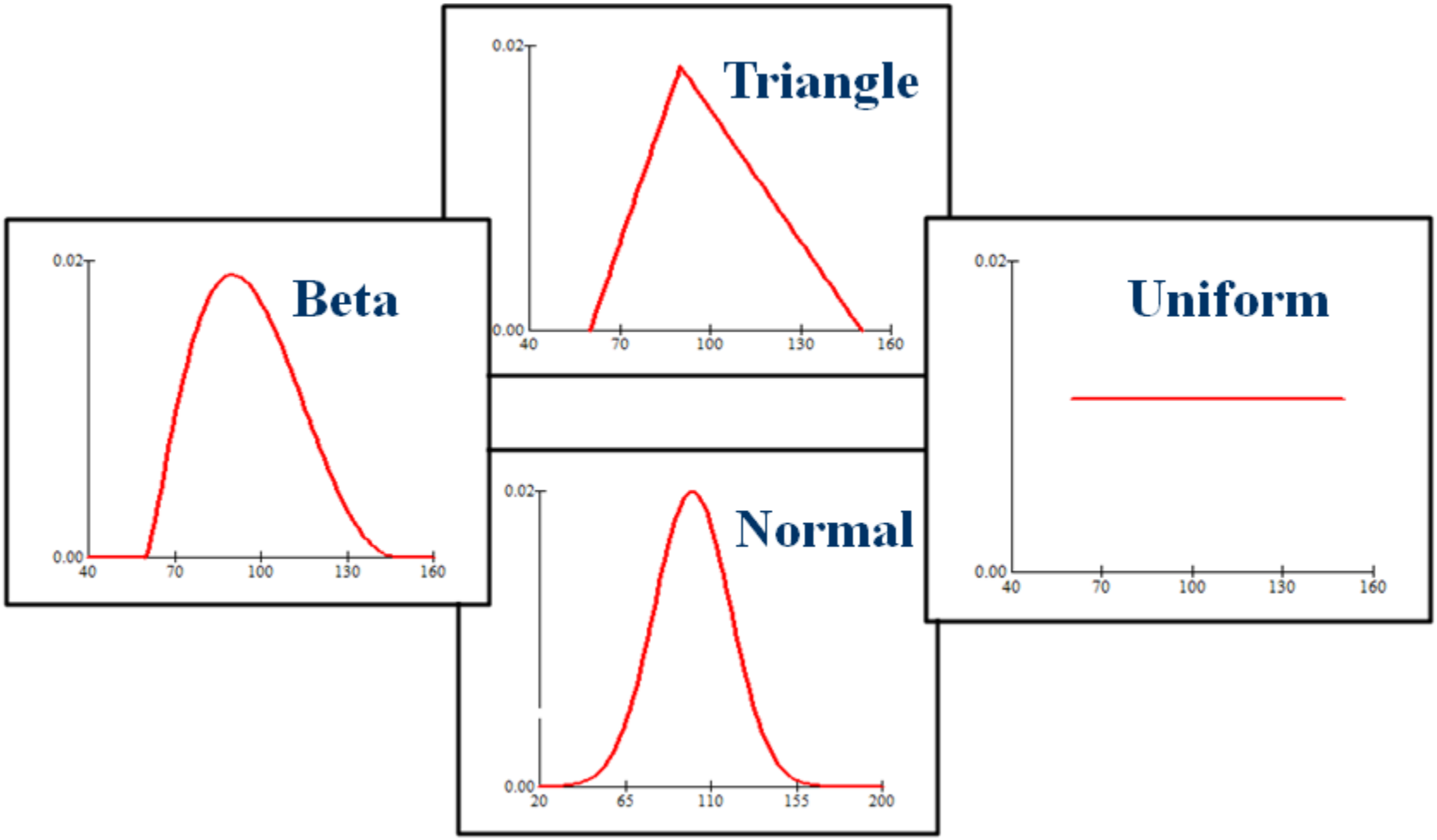


- Uncertainty
  - The lack of certainty
  - A state of having limited knowledge where it is impossible to exactly describe existing state or future outcome
- Risk:
  - A state of uncertainty, if it occurs, has a *positive* or *negative* effect on project objectives.
- Activity durations are uncertain and best represented as probability distributions



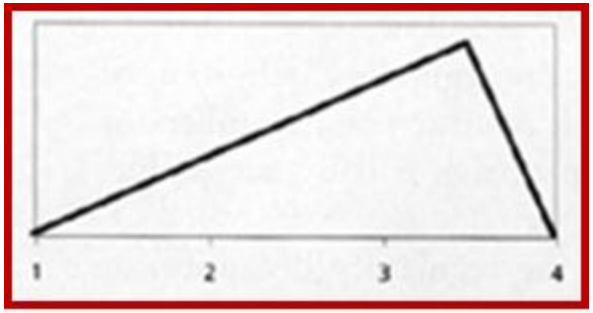
Common error is for PMs to take scheduling results as fact rather than estimates of future events.

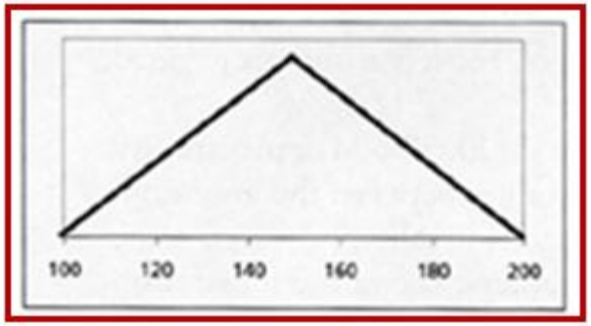
Common Probability Distributions

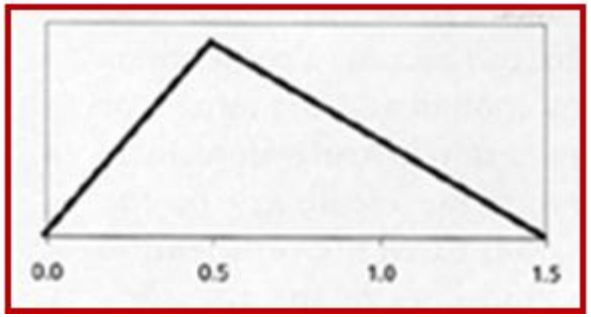


Three Point Estimate

- A technique used to estimate the time required for an activity based on historical information or expert judgement.
- 3 key inputs
  - Usually determined by interviews or expert judgement
- Optimistic duration
  - Best case duration
- Likely duration
  - The most likely duration
- Pessimistic duration
  - The worst case duration

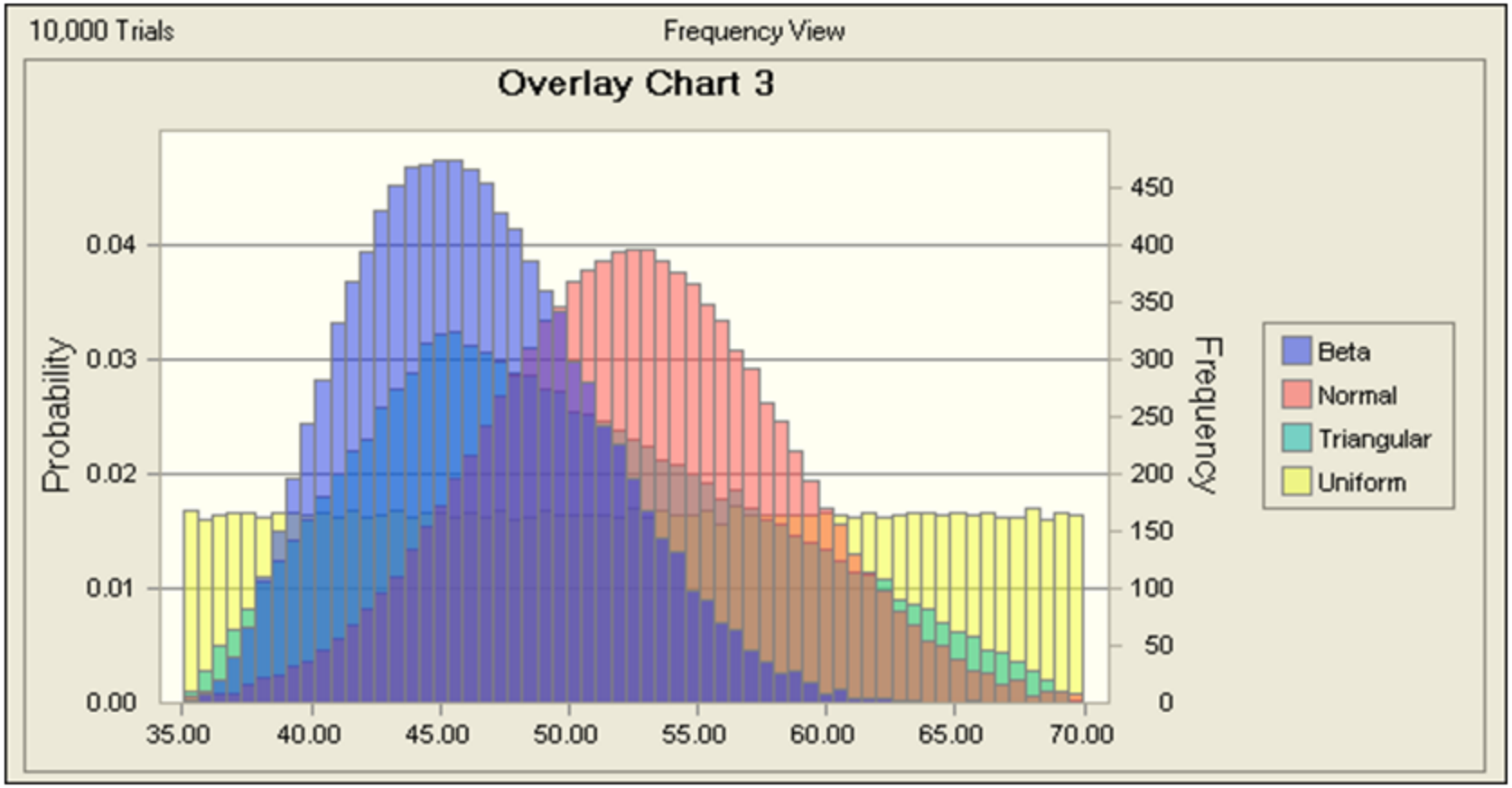






Probability Distributions Compared

Three Point Estimates (35,45,70)



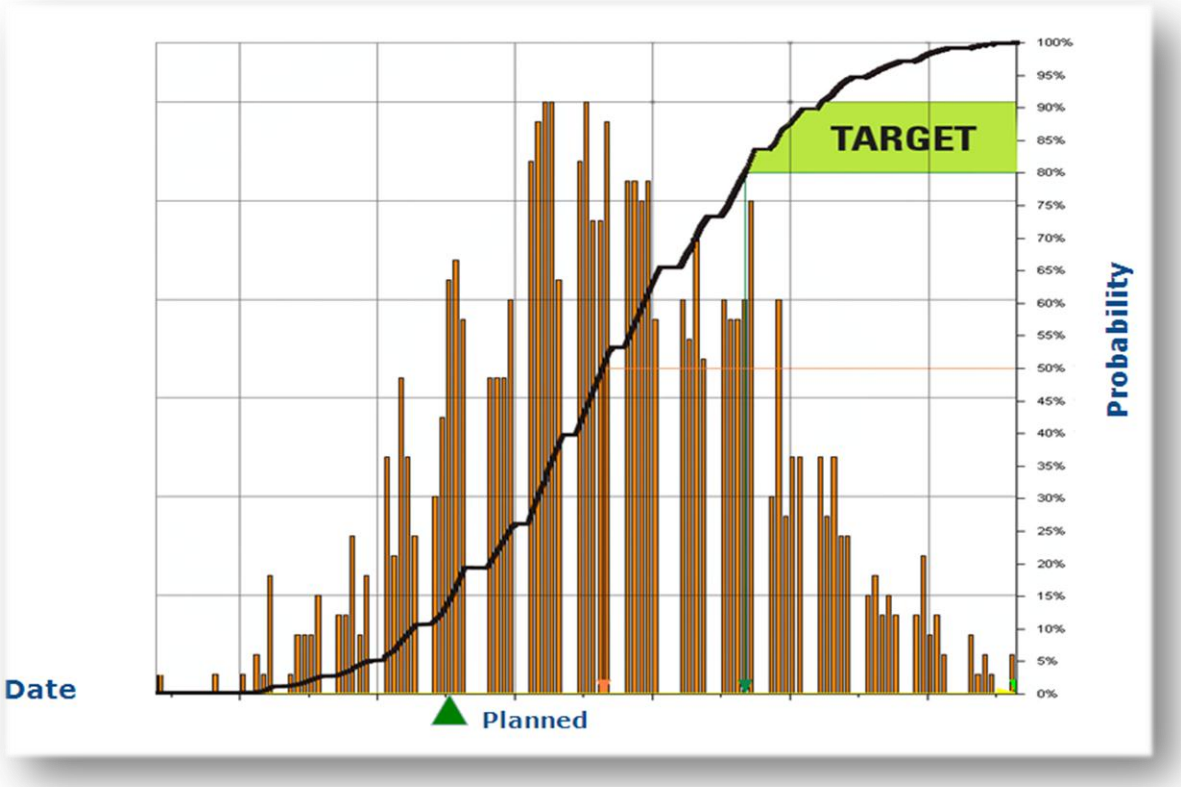
Schedule Uncertainty

- Schedule includes activities combined to form a schedule path
- What chance do I have of finishing the schedule on time ?
  - Activity uncertainty plays a key role
- Many project managers rely too heavily on the Critical Path Method (CPM) to provide the most likely completion date
  - This results in schedule dates which most of the time are *inaccurate and optimistic*
- Schedule Risk Analysis - iterative simulations performed using the Monte Carlo technique
  - Well established and best practice method

Schedule Risk Analysis

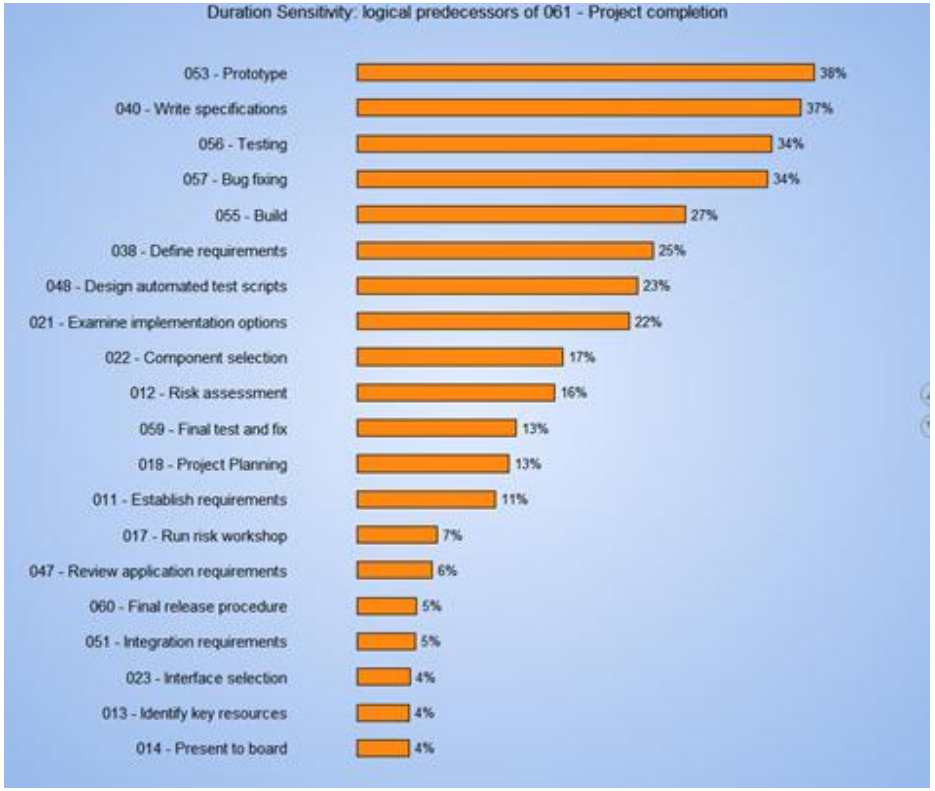
- Method to better address the questions:
  - "Is my schedule properly structured and free of errors ?"
  - "Do I understand the near critical paths ?"
  - "What chance do I have of finishing the event on time ?"
- Outputs
  - Quantification of the possibility of meeting the schedule date
  - Estimating the size of the schedule contingency needed to provide the desired level of certainty
  - Individual risks and uncertainties that cause the need for contingency to be mitigated by the project team
  - Identification of issues in project or schedule structure
  - Identification of near-critical paths that might not be apparent

Schedule Risk Analysis



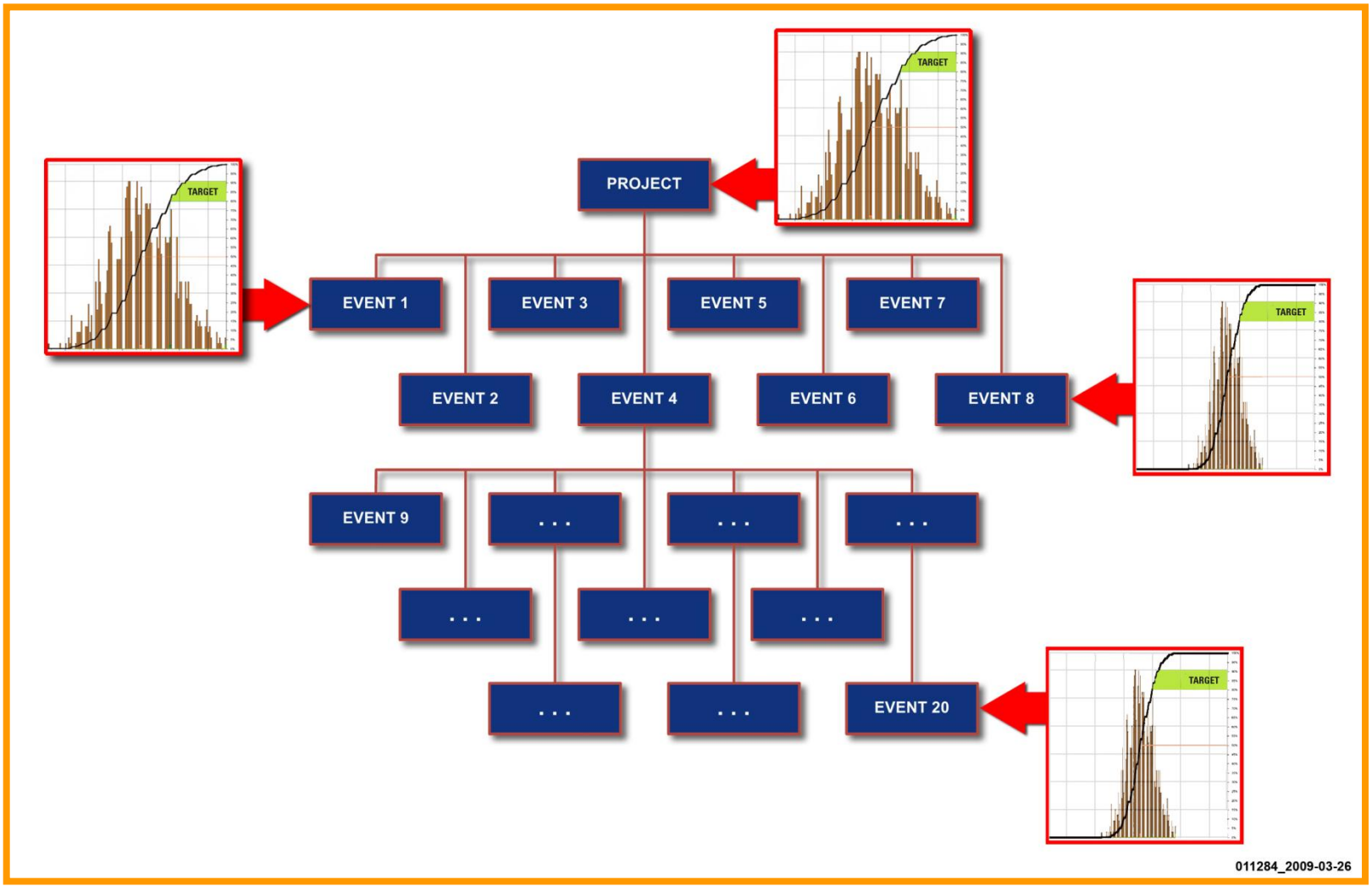
The probability of successful implementation of deterministic project schedules is low. Project planning must always include risk simulation to produce reliable results.

Sensitivity Analysis – Tornado Diagram



Sensitivity analysis allows you to identify activities which have the potential of significantly affecting your project.

The Additive Effect – Merge Bias



Critical Success Factors

- There are several factors that lead to successful SRA implementation
- It is important that the project manager be *knowledgeable and fully versed* on schedule risk analysis principles, concepts, and processes
- Represents proven techniques
- Presentation addresses 4 CSFs
  - Proper project schedule
  - High quality risk data
  - Incorporation of risks in the schedule
  - Risk aware corporate culture

Develop a Proper CPM Schedule

- Project managers *need to properly understand* the implementation and use of proper CPM scheduling methods as a tool to plan, coordinate and schedule the execution of projects
  - Proper scheduling is difficult and not well understood by most project managers or staff
  - Commercially available schedule standards and assessment tools
  - *Critical for further schedule (and cost) risk activities*
- Tendency is to force a deep dive too early because scheduling tools make it easy to do so
  - *A clear and agreed to overview of the project is required first !*
  - Executive Project Summary may be of help

Executive Project Summary

High level

Single-page view

Swim Lanes

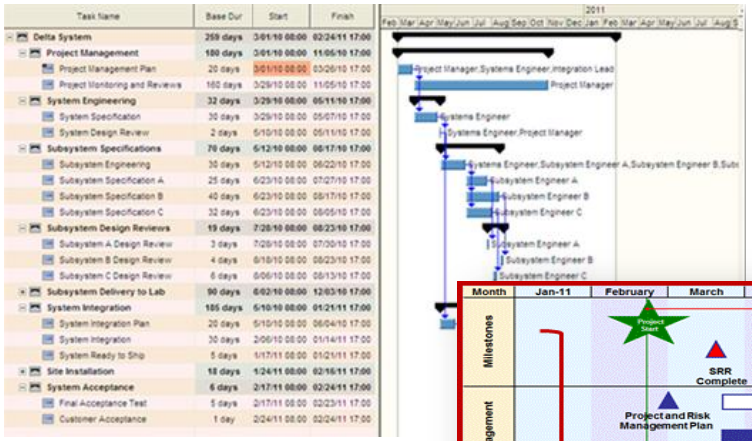
Milestones

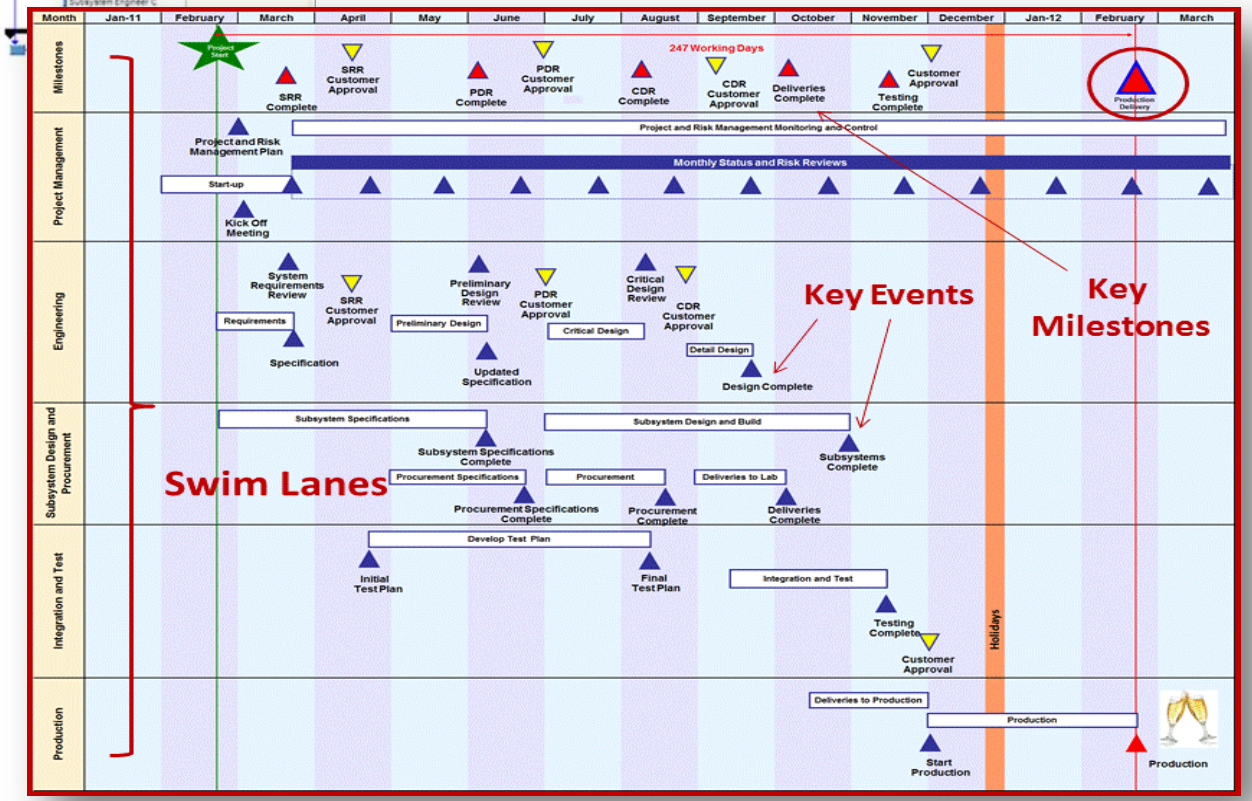
Key activities

Business oriented

End date and time remaining *clearly* shown

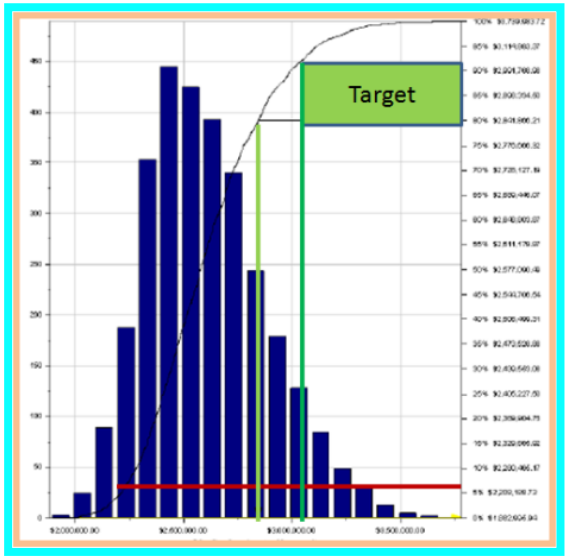
Executive Project Summary





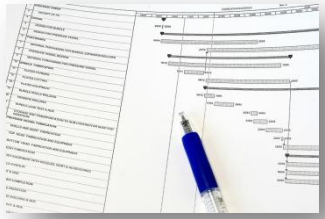
High Quality Risk Data

- Collecting risk data is a challenge
- Three types of uncertainties that must be included
  - Based on estimating error
  - Based on variability
  - Based on discrete risk events
- Motivational Bias
- Cognitive Bias
- Traditional risk registers do not have all the important risks.
  - *Some of the most important risks arise during risk data interviews*



Include Risk Activities in Schedule

- A common mistake by project managers is to not include the activities associated with the management of risk in their project schedules
- Incorporate risk management activities into the project schedule and *do not leave them* in a separate risk register
  - Increased visibility of these activities
  - More easily integrated into your project activities
  - Simple to sophisticated



- Response action plan progress and effectiveness reviewed on a regular basis and reported at project status meetings
- Supports the allocation of resources and budget for these activities

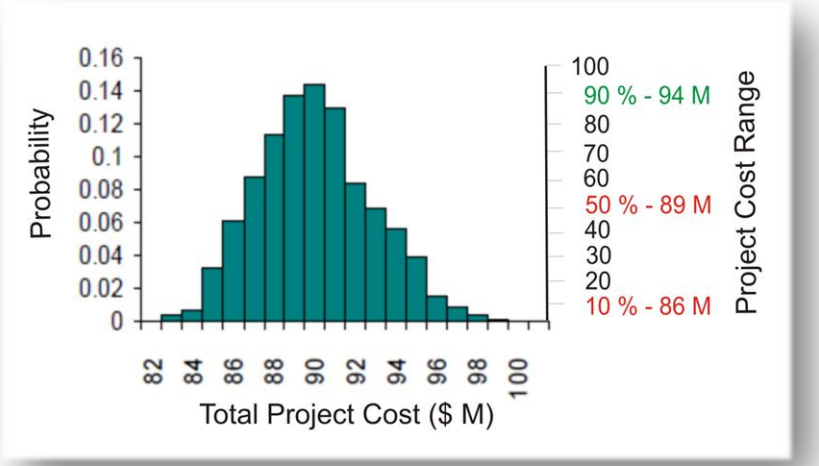
Risk Aware Corporate Culture

- Leadership risk behaviour must be constructive
- Leadership must foster an environment where there is a healthy perspective on risk and its management
- Management of risk has to be embedded in the management philosophy right from the top

Leadership must support the realistic and open recognition of project risks even if they indicate problems with the project.

Cost Risk Analysis

- Method to better address the questions:
  - "What chance do I have of finishing the event on budget ?"
  - "Why does it cost that much ?"
  - "Do I have adequate contingency to cover overruns ?"
  - "Can I defend and monitor the level of contingency I need ?"



Best approach is to implement integrated cost-schedule risk analysis which includes the impact of schedule risk on cost risk to properly identify cost contingency reserves.

Key Take Aways

- ✓ Understand project risk management basics
- ✓ Probability of successful implementation of deterministic project schedules is low
- ✓ Activity durations are uncertain and best represented as probability distributions
- ✓ Project planning must always include risk simulation to produce reliable results
- ✓ Address the critical success factors that impede success
- ✓ *Focus on what is important*
  - *Not what is easy*

Summary

- Ensure you understand the basics of risk management
  - Increase your opportunity of success
- *SRA is a powerful technique*
  - Offers increased project schedule insight despite activity uncertainty
- Increased likelihood of schedule and cost success
  - Helps to understand where the *risk comes from*
- Integrated cost-schedule risk analysis includes the impact of schedule risk on cost risk
  - *Accurate cost contingency reserves*

Questions ?

Contact Information

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