

Risk Management

- Basics and Definitions
- Risk Handling
- Processes, Tools and Methods

Risk Management

- Project Manager is in control and proactively managing events
- Avoiding as many problems as possible
- Philosophy: Act instead of Re-Act



Definitions

- Risk
 - is related to an uncertain event
 - may effect the project for good or for bad
- Risk estimation
 - Quantitative estimation of damage and probability of a risk



Definitions

- Risk assessment
 - Process of determining the acceptability of a risk
- Risk management
 - Process of risk reduction
 - Process of making a risk acceptable



Basics

- Risks are dealing with the future
- A risk might have one or several causes
- A risk might have one or several effects
- Unknown risks

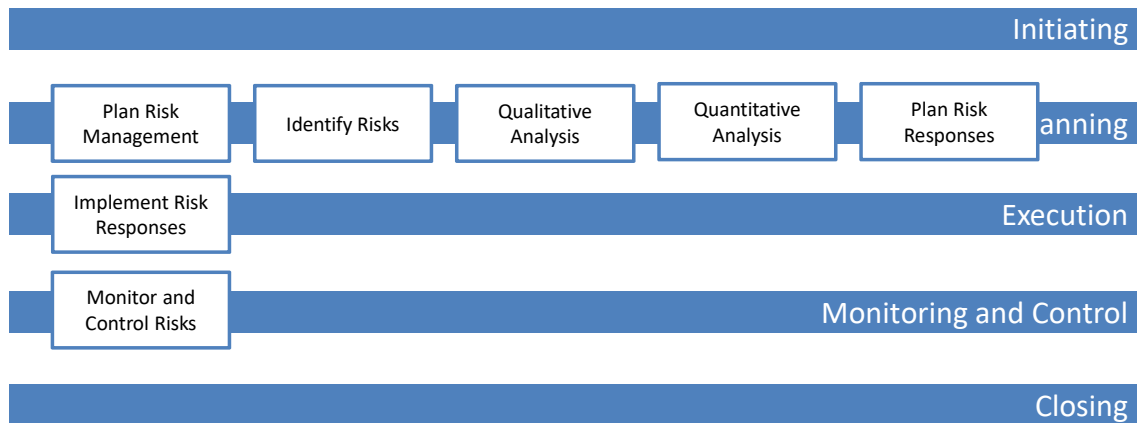


Basics

- Risk \leftrightarrow Chance
- Risk coming true = problem
- Chance coming true = opportunity



Risk Management

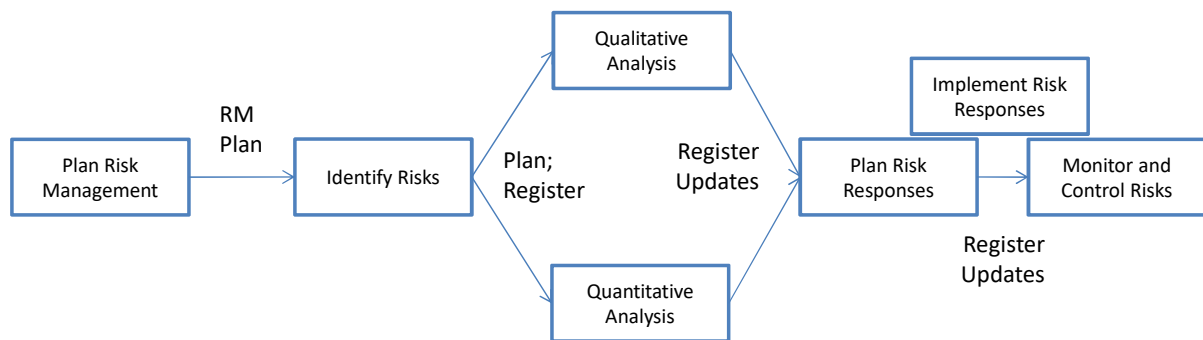


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Process Assignment

- Risk Estimation
 - Identify Risks
 - Qualitative Analysis
 - Quantitative Analysis
- Risk Assessment
 - Plan Risk Responses
- Risk Management
 - Plan Risk Management
 - Monitor and Control Risks

Process Assignment



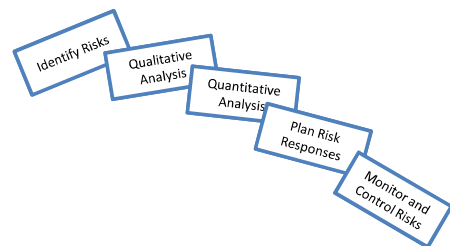
Key Outputs

Risk Management Process	Key Outputs
Plan Risk Management	Risk management plan
Identify Risks	Risk register
Perform Qualitative Risk Analysis	Risk register updates
Perform Quantitative Risk Analysis	Risk register updates
Plan Risk Responses	Risk-related contract decisions
Implement Risk Responses	Change requests
Monitor and Control Risk	Risk register updates Change requests

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Plan Risk Management

- Creating the risk management plan
- The remaining 5 processes are planned
- General and high-level plan
- Project risks → Organization



Plan Risk Management - Inputs

- Project Charter
- Project Management Plan
- Project Documents
- Enterprise Environmental Factors
- Organizational Process Assets



Plan Risk Management - Tools

- Expert Judgment
- Data Analysis
- Meetings



Plan Risk Management - Outputs

- Risk Management Plan



Risk Management Plan

- Roadmap to the other 6 risk management processes
- Defines tolerable level of risk for the project
- How risk will be managed
- Who will be responsible for risk activities
- Amount of time and costs that will be allotted to risk activities
- How risk finding will be communicated
- Description of how risk will be categorized

Identify Risk - Inputs

- Project Management Plan
- Project Documents
- Agreements
- Procurement Documentation
- Enterprise Environmental Factors
- Organizational Process Assets



Identify Risk - Tools

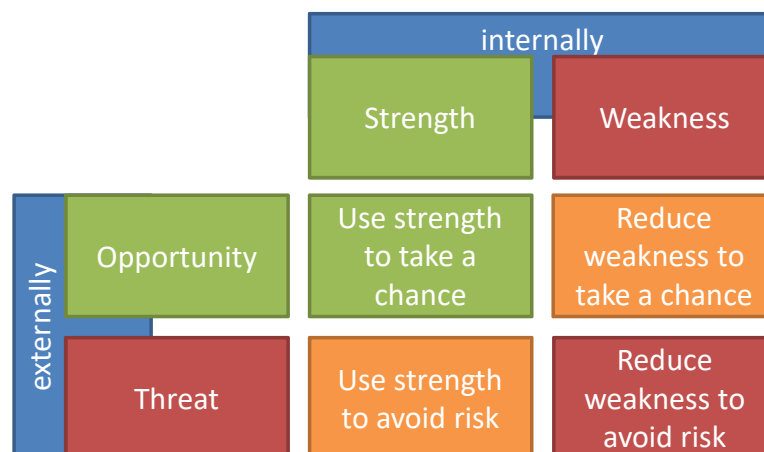
- Expert Judgment
- Data Gathering
 - Brainstorming / Checklists / Interviews /
Root Cause Analysis / Assumption and Constraint Analysis
SWOT Analysis / Document Analysis
- Interpersonal and Team Skills
- Prompt List
- Meetings



SWOT Analysis (I)



SWOT Analysis (II)



Identify Risk – Outputs

- Risk Register
- Risk Report
- Project Documents Updates



Risk Register

Risk ID	Risk	Category	Root Cause	Responses	Qualitative		
					P	D	PxD
R001	Thread of being hacked	Security	Poorly designed security Outdated technology	Firewall Intrusion detection software	3	5	15

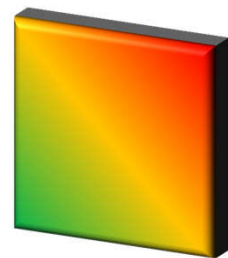
Identify risk

Plan risk responses

Quantitative

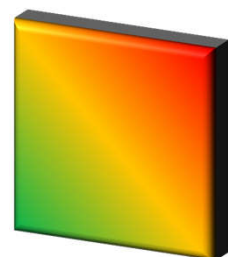
Perform Qualitative Risk Analysis

- Usually done rapidly
- Determine which risks are the highest priority
- Probability of occurring
- Impact on the project



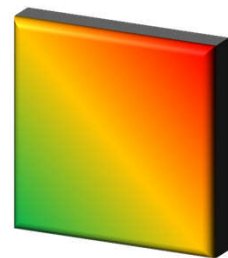
Qualitative Analysis - Inputs

- Project Management Plan
 - Risk Management Plan
- Project Documents
- Enterprise Environmental Factors
- Organizational Process Assets



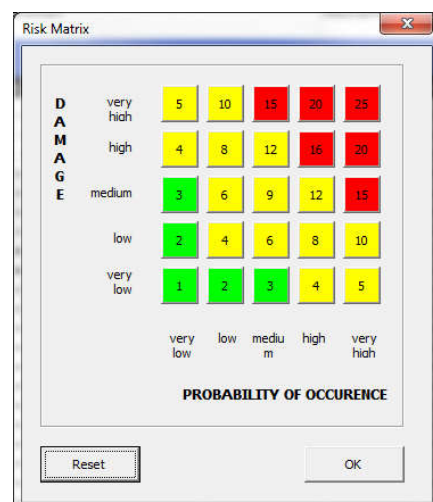
Qualitative Analysis - Tools

- Expert Judgment
- Data Gathering
 - Interviews
- Data Analysis
 - Risk Probability and Impact Assessment
 - Risk Data Quality Assessment
- Interpersonal and Team Skills
- Risk Categorization
- Data Representation
 - Probability and Impact Matrix
 - Hierarchical charts
- Meetings

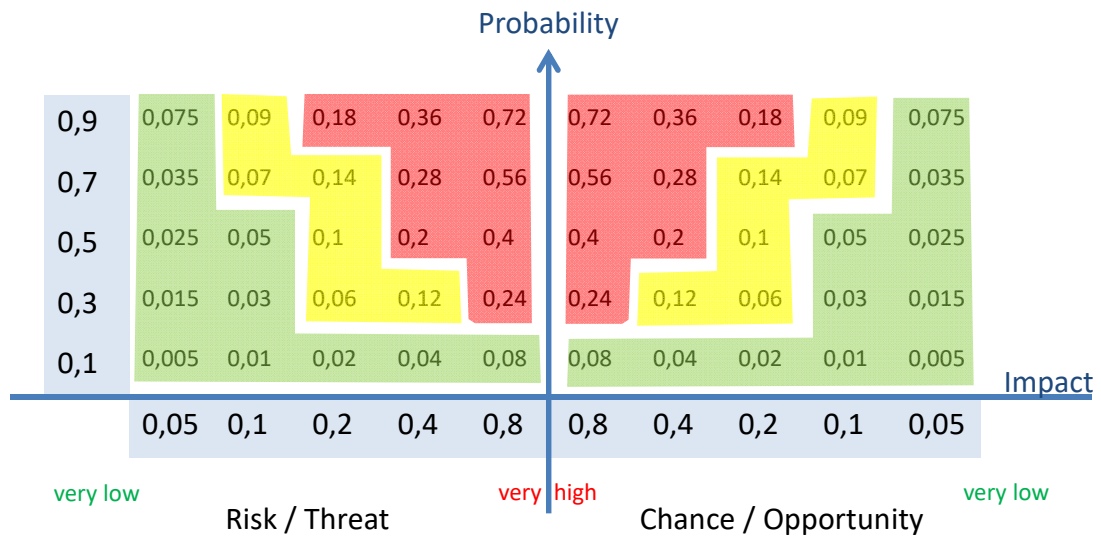


Risk Probability and Impact Matrix

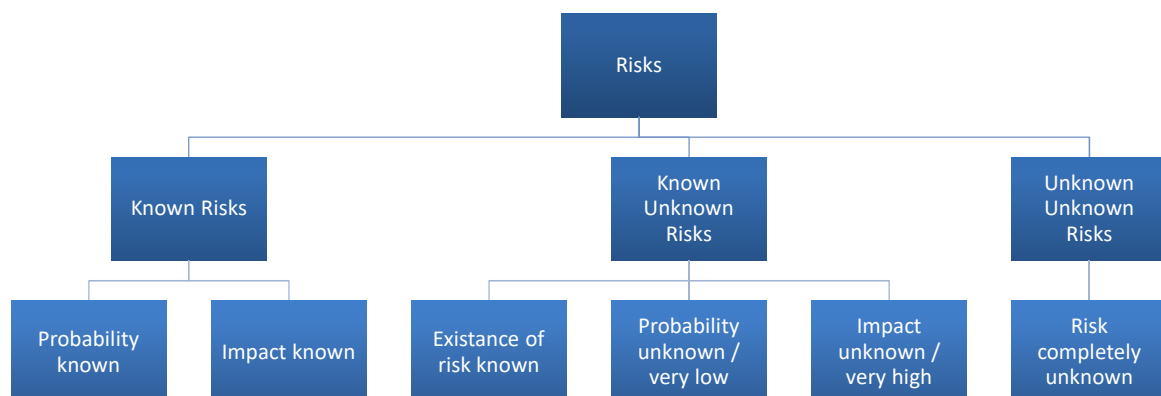
- PIM
- aka Risk Matrix



Risk / Opportunity Matrix



Risk Categories



Known und Unknown Unknowns

- Known Unknowns
 - Natural disasters
 - Global pandemics
- Unknown Unknowns
 - 9/11
 - Eyjafjallajökull
 - Uprisings in North Africa
 - Euro crisis



Source: FTD, Juni 2012



Known and Unknowns Unknowns



Source: youtube.com

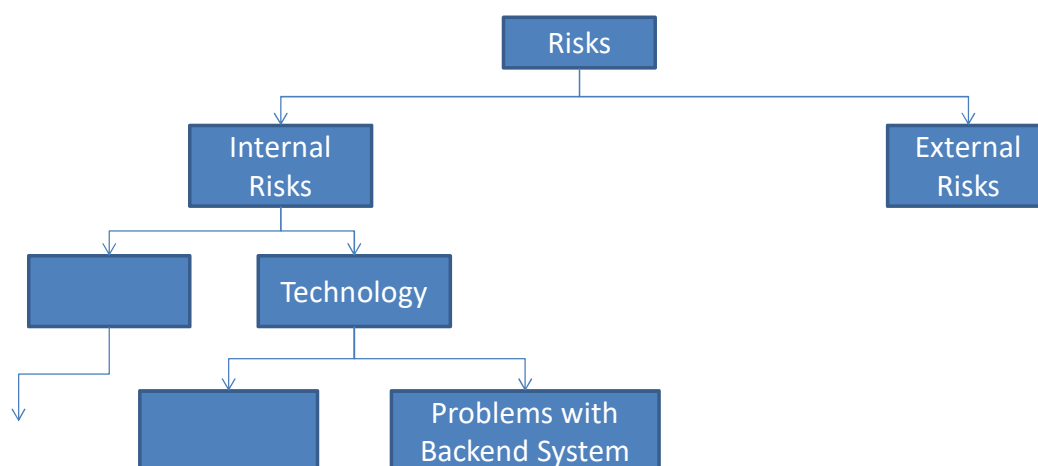
<https://www.youtube.com/watch?v=GiPe1OiKQuk>

Jim Miklaszewski: There are reports that there is no evidence of a direct link between Baghdad and some of these terrorist organizations.

Secretary Rumsfeld: There are known knowns; there are things we know we know. We also know there are known unknowns; that is to say, we know there are some things that we know we do not know. But there are also unknown unknowns; the ones we don't know we don't know.

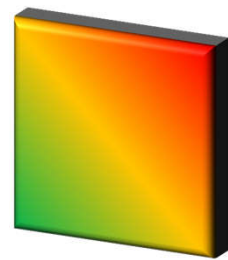


Risk Breakdown Structure



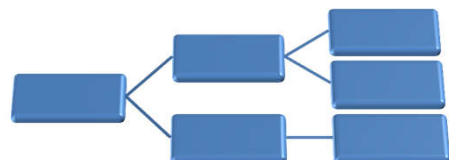
Qualitative Analysis – Outputs

- Project Documents Updates



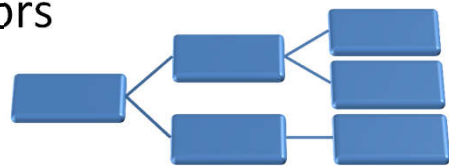
Perform Quantitative Risk Analysis

- Assign a projected value
- Quantify the risks (cost, time)



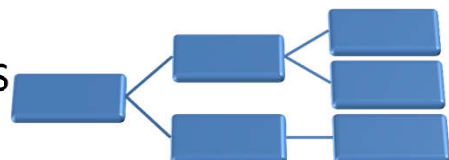
Quantitative Analysis - Inputs

- Project Management Plan
 - Risk Management Plan / Scope Baseline / Schedule Baseline / Cost Baseline
- Project Documents
- Enterprise Environmental Factors
- Organizational Process Assets



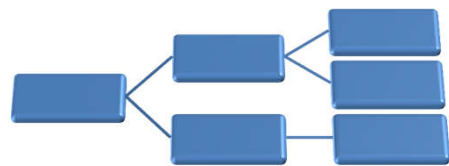
Quantitative Analysis – Tools (I)

- Expert Judgment
- Data Gathering and Representation Techniques
 - Interviews
- Interpersonal and Team Skills
 - Facilitation

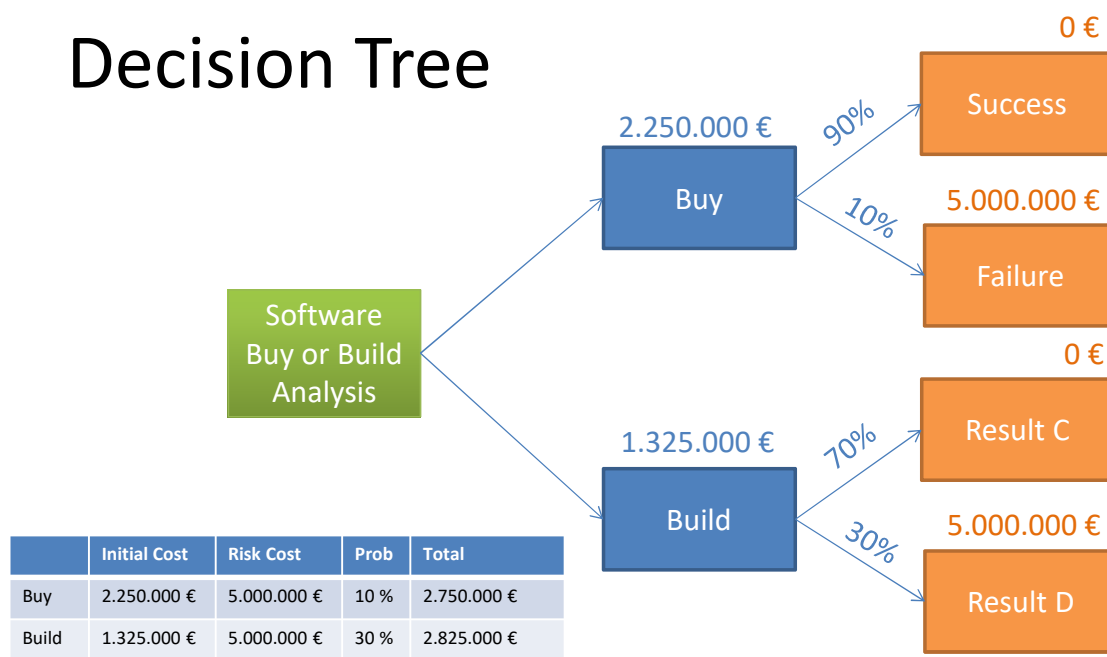


Quantitative Analysis – Tools (II)

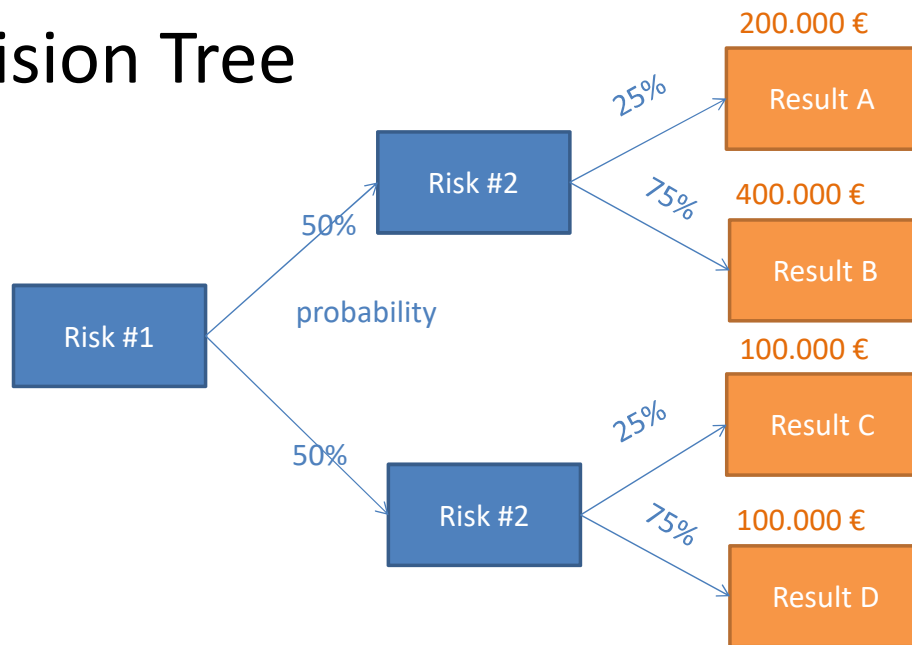
- Representations of Uncertainty
- Quantitative Risk Analysis and Modelling Techniques
 - Decision Tree Analysis
 - Simulation
 - Sensitivity Analysis
 - Influence Diagrams



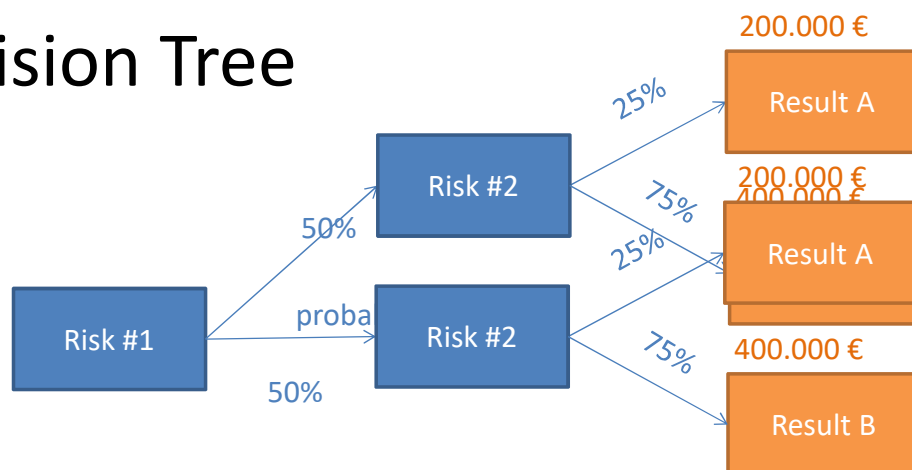
Decision Tree



Decision Tree



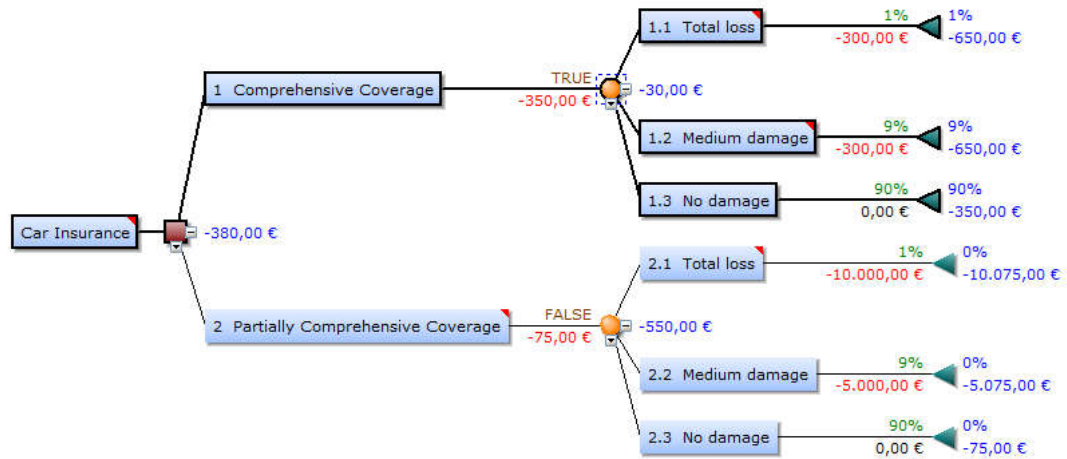
Decision Tree



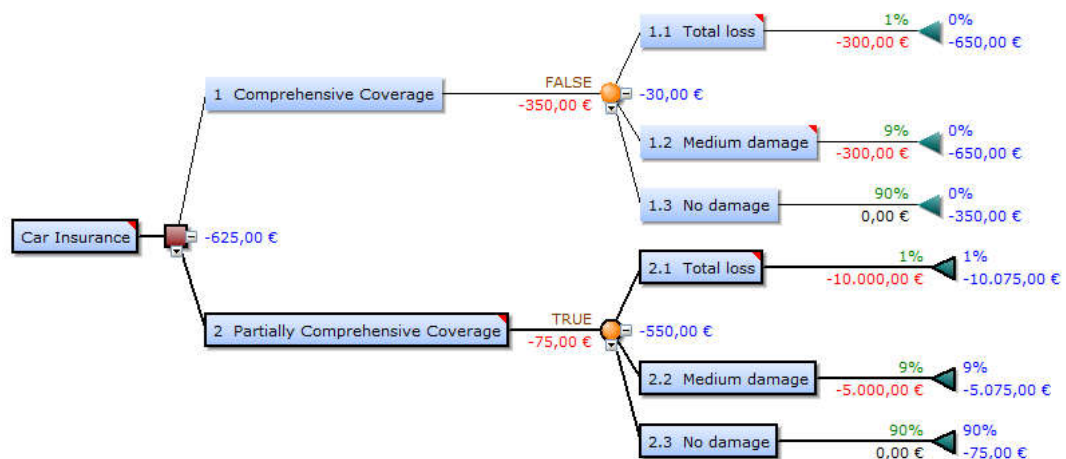
What is the expected value of result A?

What is the expected value of result B?

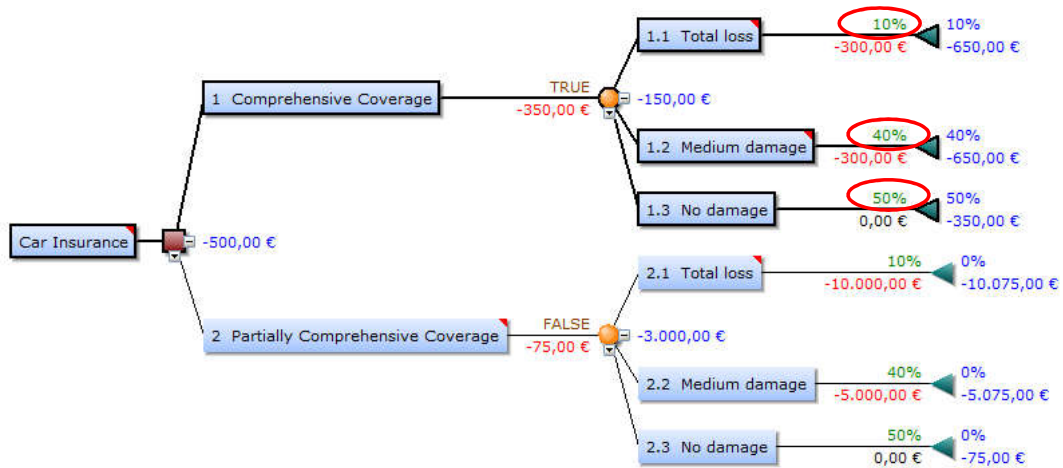
Decision Tree



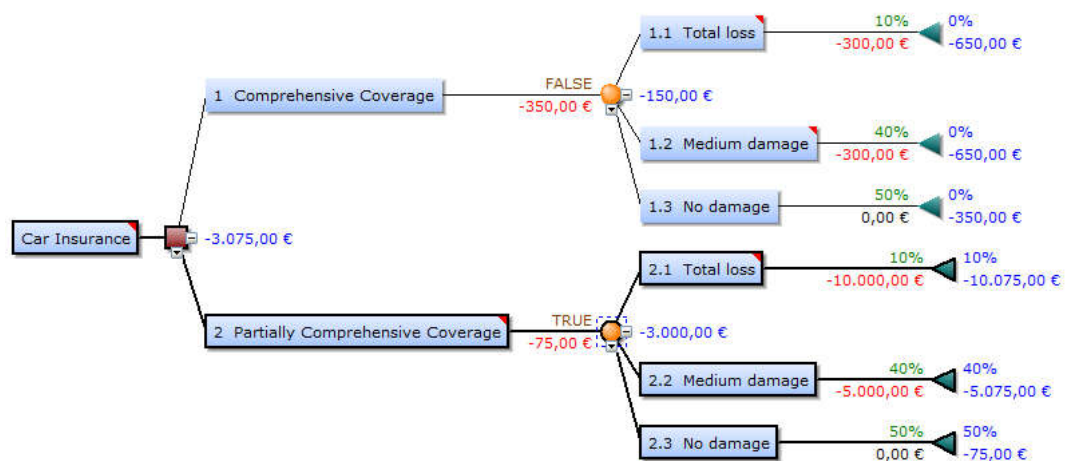
Decision Tree



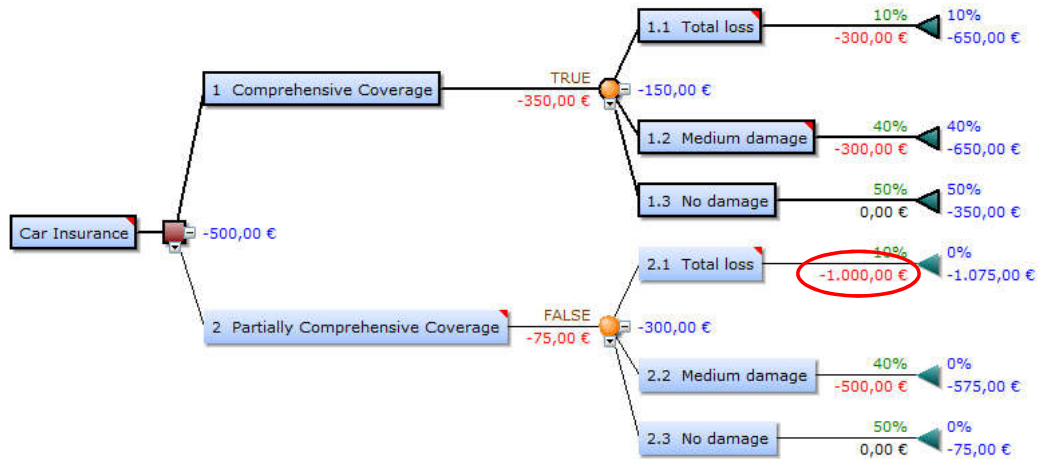
Decision Tree



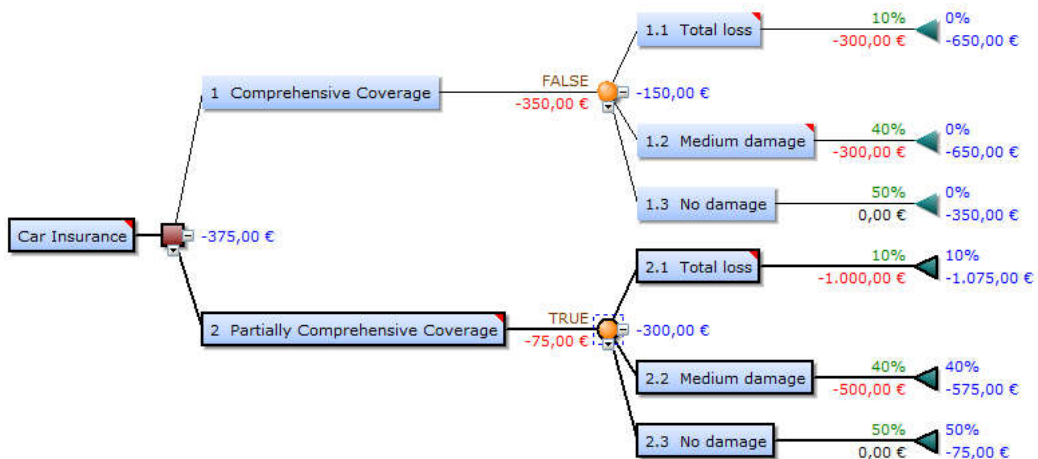
Decision Tree



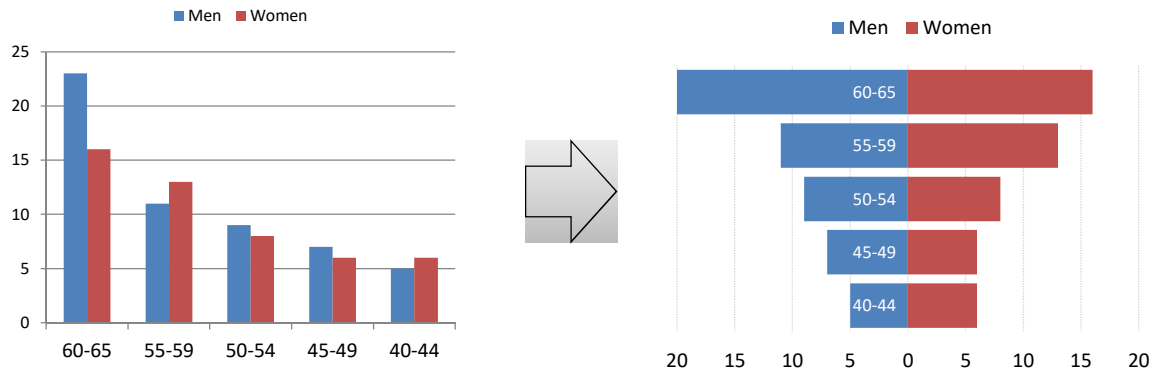
Decision Tree



Decision Tree



Tornado Diagram

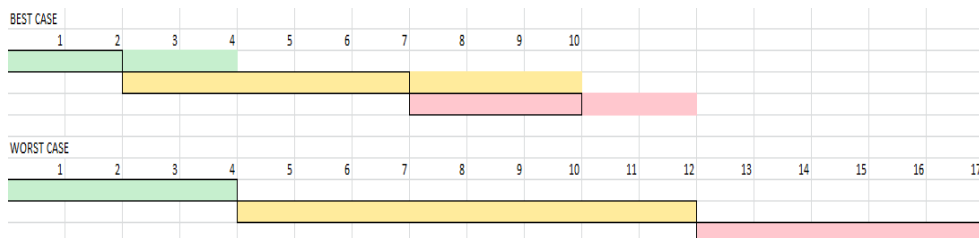
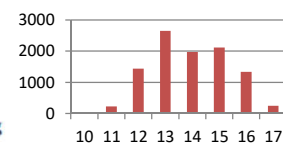


Monte Carlo Method

The project is one that involves three tasks:

- The first task is likely to take three days, but it can also be completed in two days or even four days. The probability of it taking two days to complete is 10% and the probability of it taking four days to finish is 20%.
- The second task has a 60% probability of taking six days to finish, a 20% probability each of being completed in five days or eight days.
- The final task has an 80% probability of being completed in four days, 5% probability of being completed in three days and a 15% probability of being completed in five days.

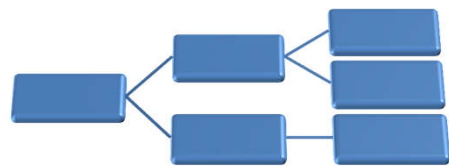
Occurrence



Source: http://www.tutorialspoint.com/management_concepts/monte_carlo_analysis.htm

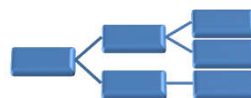
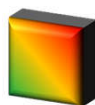
Quantitative Analysis – Outputs

- Project Documents Updates
 - Risk Report



Qualitative vs. Quantitative

- | | |
|---|--|
| <ul style="list-style-type: none">• Qualitative is about rough estimates & priority<ul style="list-style-type: none">– Probability (high/low)– Impact (high/low) | <ul style="list-style-type: none">• Quantitative is about calculations & figures<ul style="list-style-type: none">– Probability (%) x Impact (€) |
|---|--|



Plan Risk Responses

- Create a detailed plan for managing the risk
- Plan for how each risk will be handled



Plan Risk Responses - Inputs

- Project Management Plan
 - Resource Management Plan
 - Risk Management Plan
 - Cost Baseline
- Project Documents
- Enterprise Environmental Factors
- Organizational Process Assets



Plan Risk Responses – Tools (I)

- Strategies for Negative Risks or Threats
 - Avoid
 - Transfer
 - Mitigate
 - Accept



Plan Risk Responses – Tools (II)

- Strategies for Positive Risks or Opportunities
 - Exploit
 - Share
 - Enhance
 - Accept



Plan Risk Responses – Tools (III)

- Expert Judgment
- Data Gathering
- Interpersonal and Team Skills
- Contingent Response Strategies
- Strategies for overall project risk
- Data Analysis
- Decision Making



Plan Risk Responses – Outputs

- Change Requests
- Project Management Plan Updates
- Project Document Updates



Implement Risk Responses – Inputs

- Project Management Plan
 - Risk Management Plan
- Project Documents
 - Risk Register
 - Risk Report
 - Lessons Learned
- Organizational Process assets



Implement Risk Responses – Tools

- Expert Judgment
- Interpersonal and Team Skills
 - Influencing
- Project Management Information System



Implement Risk Responses – Outputs

- Change Requests
- Project Document Updates



Monitor and Control Risks

- Look back over the plan
- Compare with execution that has taken place



Monitor and Control Risks - Inputs

- Project Management Plan
- Project Documents
- Work Performance Data
- Work Performance Reports



Monitor and Control Risks - Tools

- Data Analysis
 - Technical Performance Measurement
 - Reserve Analysis
- Audits
- Meetings



Monitor and Control Risks - Outputs

- Work Performance Information
- Change Requests
- Project Management Plan Updates
- Project Document Updates
- Organization Process Assets Update

