Project Uncertainty
Management

Based on Presentation given by
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Project Uncertainty Management

- A gradual change in how we define projects
- From risk management towards uncertainty management
- Towards life cycle management
- Towards a holistic approach
- Focus on value creation
From risk management towards uncertainty management

- A number of different definitions of risk and uncertainty are currently being used.
- The term “Risk” is considered and perceived as a negative outcome and contains elements of fear.
Uncertainty, (Risk and opportunities)

**Uncertainty**
Ability to predict outcome of parameters or foresee events that may impact the project. Uncertainties have a defined range of possible outcomes described by functions reflecting the probability for each outcome. Uncertainty functions can describe discrete events or continuous ranges of outcomes.

**Risk**
Possible negative outcome expressed by probability multiplied by the consequence.

**Opportunity**
Possible positive outcome expressed by probability multiplied by the consequence.
From risk management towards uncertainty management

Chapman and Ward (2002) [7], defines

- **Uncertainty**, “lack of certainty, involving variability and ambiguity”.
- **Variability**, “uncertainty about the size of parameters which may result from lack of data, lack of detail, lack of definition, lack of experience and so on, which may be quantified if this is useful”
- **Ambiguity**, “the aspects of uncertainty not addressed in terms of variability”
- **Risk**, “an implication of significant uncertainty which may be upside (welcome) or downside unwelcome”
The Room of Uncertainty

- Dynamic
- Complexity
- Uncertainty
- Ambiguity
- Trustworthiness
- Risk based strategies
- Precautionary strategies
- Leverage strategies
- Success factors
<table>
<thead>
<tr>
<th>Challenge</th>
<th>Objective</th>
<th>Function</th>
<th>Strategies</th>
<th>Instruments</th>
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</thead>
<tbody>
<tr>
<td>Complexity</td>
<td>Effective, efficient and Adequate protection</td>
<td>Agreement on casual relations</td>
<td>Reducing damage potential, limiting overall risk level</td>
<td>Standards, procedures, comparisons, cost effectiveness, risk-benefit analysis</td>
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<tr>
<td>Dynamic</td>
<td>Sustainability and tolerability, vulnerability</td>
<td>Behavioral over time (BOT), global change, fundamental measures, content and contextual</td>
<td>Leverage, actions of interventions with lasting impact and to reverse adverse trends and breaking vicious cycles</td>
<td>Dynamic modeling, scenario planning and modeling, casual loop modeling</td>
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<td>Ambiguity</td>
<td>Socially acceptable development path</td>
<td>Resolving value conflicts and assuring fair treatment of concerns and visions.</td>
<td>Consensus Seeking discourse</td>
<td>Advisory committees, citizen, panels, value tree analysis</td>
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<tr>
<td>Uncertainty</td>
<td>Resilience Efficient and fair distribution of burden(s)</td>
<td>Avoiding irreversibility’s and vulnerabilities. Balancing cost of under-protection vs. cost of overprotection facing uncertain outcome</td>
<td>Diversity, flexibility limiting range of effects, Trade off analysis</td>
<td>Containment in time and space, development of substitutes. Negotiated rule making decision analysis</td>
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Dimensions of project complexity

Project Complexity

Structural Complexity
- Size: Number of elements
- Interdependence of elements

Uncertainty
- Uncertainty in goals
- Uncertainty in methods

Interactions in complex Ways: total is more than Sum of the parts

Structural complexity compounded by uncertainty
Project Organization and Contracts

- **Uncertainty management**
  - Uncertainty management in projects is a project management knowledge area comprising management and control of risks and opportunities in the project.
  - Uncertainty management is divided into risk management and opportunity management.

- **Risk management**
  - A continuous process to identify, analyse and follow up uncertainties which can lead to negative impacts on the project by implementing response actions to avoid risks jeopardizing a successful completion of the project.

- **Opportunity management**
  - A continuous process to identify, analyse and follow up uncertainties which can lead to positive impacts on the project by implementing response actions to benefit from the opportunities.
Project Organization and Contracts

Uncertainty Management Process

- Uncertainty identification
- Continuous process
- Uncertainty assessment
- Uncertainty response actions
- Uncertainty response control
Ad-hoc uncertainty analysis can be initiated within a number of areas throughout the project phases.
The classical project management techniques and uncertainty management

- Unsuitable in complex and dynamic project environments
- Unattended schedule dynamics not adequately attended
- Limited capabilities to interfaces
- Focused on lag instead of lead indicators
An alternative approach

(Project uncertainty management)

- A dual approach using conventional techniques and planning abstractions
- Planning windows
- Milestone structures
- Interface management system
- Critical success factors and lead indicators
Project Organization and Contracts
Planning and Control Structure

Level of Integration
Window abstraction

Project Management - Uncertainty management

Performance measurement and control

Network abstraction

Interface schedules

Planning windows

Milestone structure/success criteria

Uncertainty Management

Work processes

Planning and control levels

Project network multiple projects
PLANNING WINDOW

Business Model

Owner

Values (forces)

Success Criteria

Value creation

Planning Window

Emergent situations

Suppliers

Contractors

Community
Project Organization and Contracts

- RPM process (Generic, 8 stages)

1. Conceive
2. Design
3. Plan
4. Allocate
5. Execute
6. Deliver
7. Review and Support
8. and Support

Steps and roles for uncertainty management

Project Organization and Contracts

- The Six *Ws*
- *Some key components of a risk model*

Who, Parties
Why, Motives
What, Design
Which way, Activities
Wherewithal, Resources
When, Timetable
# Project Organization and Contracts

Risk Management Process (RPM)  
(Phased structure comparison)

<table>
<thead>
<tr>
<th>APM</th>
<th>UK MoD (1991)</th>
<th>CERT (Chapan, 1979)</th>
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<tbody>
<tr>
<td>Define</td>
<td>Initiation</td>
<td>Scope</td>
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<td>Focus</td>
<td>Identification</td>
<td>Structure</td>
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<td>Identify</td>
<td>Analysis</td>
<td>Parameter</td>
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<td>Structure</td>
<td>Planning Management</td>
<td>Manipulation and interpretation</td>
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