RISK MANAGEMENT IN PROJECTS

Project Management and Leadership – 2016
UNCERTAINTY

a. The state of not being definitely known or perfectly clear

ALEATORY UNCERTAINTY—objective and irreducible uncertainty about future occurrences that is due to inherent stochasticity in physical or biological systems;

EPISTEMIC UNCERTAINTY—subjective and reducible, results from a lack of knowledge about the quantities or processes identified with a system

(TOBLER & WEBER in GLIMCHER & FEHR 2014, p.150)

b. Something not definitely known or knowable
RISK

Effect of uncertainty on objectives.

[An effect is a deviation from the expected — positive and/or negative; objectives can have different aspects (such as financial, health and safety, and environmental goals) and can apply at different levels (such as strategic, organization-wide, project, product and process)
The assessment and comparison of expected reward and expected risk is the essential survival task of organisms.

The brains of all living creatures contain a reward-seeking system and loss-avoidance system to perform this survival task.

(WARGO et al. in STANTON et al. 2010, p.84)
ELLISBERG PARADOX

1. Gamble A (red) or B (black)?
2. C (red or yellow) or D (black or yellow)?
RISK MANAGEMENT

being smart about taking chances
WE ARE NOT REALLY OBJECTIVE. REALLY.

OVERESTIMATION
OVERPRECISION
OVERPLACEMENT
WE CANNOT RELY ON EXPERIENCE ALONE

Experience is a nonrandom sample of events throughout our lifetime. It’s memory-based (we are selective regarding what to remember). We remember extremes in our experience (the peak-end rule). What we conclude from our experience can be full of logical errors. Without feedback on past decisions, our experience is not useful.

(mod. HUBBARD 2009, p.96)
HIGHLIGHTS:

1. UNCERTAINTY WILL ALWAYS EXIST, AND SO WILL RISKS—EFFECTS OF UNCERTAINTY ON OBJECTIVES.
2. THESE EFFECTS CAN BE POSITIVE
3. RISK MANAGEMENT IS BEING SMART ABOUT TAKING CHANCES
4. OUR PSYCHOLOGICAL TRAITS CALL FOR A SYSTEMATIC APPROACH TO RM
RISK MANAGEMENT PROCESS

- Risk process initiation
  - Risk identification
    - Qualitative risk assessment
      - Quantitative risk analysis
        - Risk response planning
          - Risk response implementation
            - Risk review
              - Post-project review

(mod. TURNER 2014, p.288)
RISK MANAGEMENT PROCESS (PMBOK)

PLAN RISK MANAGEMENT
IDENTIFY RISKS
PERFORM QUALITATIVE RISK ANALYSIS
PERFORM QUANTITATIVE RISK ANALYSIS
PLAN RISK RESPONSES
MONITOR AND CONTROL RISKS
IDENTIFY RISKS

Documentation reviews; expert judgment; checklist analysis
Information gathering techniques
SWOT analysis
Assumptions analysis
Pre-mortem
Diagramming techniques
  CAUSE-AND-EFFECT DIAGRAM
  PROCESS FLOW CHART
  INFLUENCE DIAGRAM

(mod. PMBOK 2013, p.319)
CAUSE-AND-EFFECT DIAGRAM

Displays potential causes of a problem, depicting them as “off-shoots” or bones of a fish stemming from the problematic outcome as the “head” of the fish
A pictorial representation of the sequence of actions that comprise a process. Used to (1) document processes, (2) analyze and improve processes.
INFLUENCE DIAGRAM (ID)

A visual representation of a decision problem that offers an intuitive way to represent decisions, uncertainties, objectives, and their mutual interactions.  

(mod. CONDAMIN et al. 2006, p.31)
BUILDING AN INFLUENCE DIAGRAM

No loops in ID!
RISK REGISTER

A document in which the results of risk analysis and risk response planning are recorded

(mod. PMBOK 2013, p.560)

The risk register will detail all identified risks (including description, category, cause, probability of occurring, impact(s) on objectives, proposed responses, owners, and current status)
QUALITATIVE RISK ANALYSIS

Risk PROBABILITY and IMPACT assessment
Probability and impact matrix
Risk data quality assessment
Risk categorization
Risk urgency assessment
Expert judgment
PROBLEMS WITH THE SCORING METHODS

Do not consider the issues about perception of risks/uncertainties
Add their own sources of error as a result of unintended consequences of their structure
Create an ‘illusion of communication’.
Qualitative descriptions of likelihood are understood differently by different people

(mod. HUBBARD 2009, pp.122-123, 127-128)
## VARIANCES IN UNDERSTANDING OF COMMON TERMS USED IN THE IPCC REPORT TO EXPRESS UNCERTAINTY

<table>
<thead>
<tr>
<th>Probability Phrase</th>
<th>IPCC Guidelines for Meaning of Phrase</th>
<th>Interpreted Meaning According to Subjects (Distribution of Actual Responses)</th>
<th>Percent of Responses that Violated Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Likely</td>
<td>&gt; 90%</td>
<td>Minimum of All Responses: 43%</td>
<td>Maximum of All Responses: 99%</td>
</tr>
<tr>
<td>Likely</td>
<td>&gt; 66%</td>
<td>45%</td>
<td>84%</td>
</tr>
<tr>
<td>Unlikely</td>
<td>&lt; 33%</td>
<td>8%</td>
<td>66%</td>
</tr>
<tr>
<td>Very Unlikely</td>
<td>&lt; 10%</td>
<td>3%</td>
<td>76%</td>
</tr>
</tbody>
</table>

*Source: David V. Budescu, Stephen Broomell, and Han-Hui Po, University of Illinois at Urbana-Champaign.*
QUANTITATIVE TECHNIQUES

SENSITIVITY ANALYSIS helps to determine which risks have the most potential impact on the project; examines the extent to which the uncertainty of each project element affects the objective examined when all other uncertain elements are held at their baseline values (TORNADO CHARTS).

EXPECTED MONETARY VALUE (EMV) ANALYSIS helps to calculate the average outcome when the future includes scenarios that may or may not happen (DECISION TREES).

MODELING AND SIMULATION uses a model that translates the specified detailed uncertainties of the project into their potential impact on project objectives (MONTE CARLO).
UPDATES TO RISK REGISTER

Probabilistic analysis of the project
Probability of achieving cost and time objectives
Prioritized list of quantified risks
Trends in quantitative risk analysis results
RISK RESPONSE STRATEGIES

ACCEPTANCE
AVOIDANCE
MITIGATION
TRANSFERENCE
RISK MANAGEMENT PLAN

The document describing how project risk management will be structured and performed on the project. 

Information varies by application area and project size. Includes:

- Methodology
- Roles and responsibilities
- Budgeting
- Timing
- Risk categories (i.e. Risk breakdown structure)
- Definitions of risk probability and impact
- Revised stakeholders’ tolerances
- Tracking

(mod. PMBOK 2013, p.560)
As a risk manager you should always assume the list of considered risks, no matter how extensive, is incomplete...
HIGHLIGHTS:

5. RISK MANAGEMENT (RM) STARTS AT RISKS IDENTIFICATION, GOES THROUGH ANALYSES, ENDS UP WITH PLANNING RESPONSES

6. DIAGRAMMING TECHNIQUES AND PRE-MORTEMS ARE POWERFUL TOOLS TO IDENTIFY RISKS

7. BEWARE OF WIDELY SPREAD PSEUDOSCIENTIFIC APPROACHES IN RM

8. YOUR RISK REGISTER (AND PLAN) ARE NEVER CONSUMMATE
BLACK SWAN

The phenomenon of our inability to predict the future from the past

Popularized by Nassim Nicholas Taleb (2007, 2010)
CRISIS MANAGEMENT

Crisis are neither rare nor random; they are a part of our lives.
Crisis cannot always be foreseen or prevented.
Man-made crises are not inevitable: the public is unforgiving.
Crisis management requires a heads-up approach with a very quick reaction time combined with a concerted effort on the part of possibly all employees.

(mod. KERZNER 2009, p.970-972)
CRISIS MANAGEMENT LIFE CYCLE

- EARLY WARNING
- PROBLEM UNDERSTANDING
- DAMAGE ASSESSMENT
- CRISIS RESOLUTION
- LESSONS LEARNED

STAKEHOLDER COMMUNICATION
IMPLICATIONS FOR PROJECT MANAGEMENT

1. Organize the Crisis Committee
2. Establish crisis communications
3. Manage stakeholders
4. Assume responsibility
5. Respond fast
6. Be compassionate
7. Document everything
8. Capture Lessons Learned
RESILIENCE

The fundamental characteristic of a resilient [system] is that it does not lose control of what it does, but is able to continue and rebound.

(mod. HOLLNAGEL 2006, p.348)
REQUIRED QUALITIES OF A RESILIENT SYSTEM

ANTICIPATORY – knowing what to expect
ATTENTIVE – knowing what to look for
RESPONSIVE – knowing what to do

KNOWLEDGEABLE
COMPETENT
RESOURCESFUL
A PERMANENT LEARNER

(mod. HOLLNAGEL 2006, p.348)
Perché certi tesori esistono soltanto per chi batte per primo una strada nuova... ‘La strada che non andava in nessun posto’ (Gianni Rodari)

“Because some treasures only exist for those who beat a new road first...”
HIGHLIGHTS:

9. CRISES CAN AND WILL HAPPEN. DO NOT HIDE.
10. BE RESILIENT
11. EMBRACE UNCERTAINTY.