Faculty of Engineering and Mathematical Sciences

Project Management & Engineering Practice
(GENG 5505)

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Risk management: Proactively managing uncertainty, complexity and change (Ch 10)

(Week 6a) - Lecture eleven, 9th April 2024

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Defining risk & management

Risk

- The possibility of loss or injury;
- Situation, problem, enhancement or opportunity having a measured impact (positive or negative) on an outcome;
- Exposure of an activity to an uncertain outcome;

Risk management

- The iterative process of: Identifying, assessing, analyzing, managing & monitoring and evaluating & reviewing risk.

Potential sources of risk

Internal (controllable)

Some examples:
- Ambiguous project charter
- Communication bottlenecks
- Managerial incompetence
- Lack of reporting
- Lags in decision making
- Poor deliverable definition
- Inaccurate estimates
- Limited resources
- Limited capability
- Lack of accountability
- …

SWOT analysis

PESTELG framework

External (uncontrollable)

Some examples:
- Economic cycles
- Changing technology
- Legislative constraints
- Environmental factors
- Social changes
- Supplier capability
- Stakeholder expectations
- Variable contractor performance
- …

***Key stakeholders should all be involved in identifying & managing risks

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SWOT

S-trenghts
W-eaknesses
O-pportunities
T-hreats

PESTELG

Political
Economic
Social
Technological
Environmental
Legal
Global

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PMBOK process risk categories

Review the potential risks which can occur in each of the 9 PMBOK processes/competencies – Please refer to table 10.2 in the textbook, p. 342.

IDENTIFYNG RISK: TOOLS & TECHNIQUES

- Risk registers
- Project completion reports
- Lessons learned
- Historical research (or hindsight reviews)
- Checklists
- Fishbone diagrams
- SWOT analysis
- PESTELG
- Brainstorming
- Critical incident reports

- Risk specialists
- Strategic plans
- Interviews & workshops
- Project charter
- Feasibility studies
- Impact assessment studies
- Industry databases
- Subject matter experts
- Specification descriptions
- Simulations
- ....

Assessing the risk: The 5 by 5 priority grid

Probability \ Impact	1	2	3	4	5
1	1	2	3	4	5
2	2	4	6	8	10
3	3	6	9	12	15
4	4	8	12	16	20
5	5	10	15	20	25

Existing operational controls

Project management intervention

Senior management intervention

Probability

1	Remote
2	Unlikely
3	Likely
4	Very likely
5	Certain

Impact

1	Insignificant
2	Minor
3	Moderate
4	Major
5	Catastrophic

- Values 1-6= Dealt with by existing procedures;
- Values 8-12= Project manager intervention;
- Values 15-25= Senior management intervention;

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Analysing the risk

- Program Evaluation & Review Technique (PERT analysis) considers the critical path and other networks;
- SWOT and PESTELG analysis – consider issues impacting the situation;
- Expert judgement – considers opinions, perspectives & viewpoints;
- Stakeholder forums – considers expectations, objectives & deliverables;
- Decision trees – considers possible paths & expected values returned;
- Sensitivity analysis – considers demand, feasibility, take-up;
- Impact analysis – considers action & consequences;
- Scenario scheduling – considers alternative scheduling options;
- Contingency planning – considers possible options & recovery strategies;
- Financial modelling - considers financial implications for funding & cash flows;
- ....

Managing the Risk: possible risk responses

1. Reject - modify plan to eliminate risk;
2. Accept - addressed as they arise;
3. Mitigate - proactive action to minimize the impact;
4. Share - partnership with 3rd party;
5. Transfer - outsourced to 3rd party;
6. Enhance - actively increase the probability and/or positive impacts of an opportunity;
7. Exploit: ensure that the identified opportunity is realised by eliminating the uncertainty around it altogether so that the opportunity definitely happens.

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Monitoring & evaluating: Documenting the risk register

Risk event	Probability	Impact	Priority	Strategy	Responsibility	Review

- The more detailed the risk event, the more targeted the response;
- Managed risk requires the ‘right’ owner;
- Risk is always communicated and owned by all stakeholders;
- Risk is either rejected, accepted or managed;
- Risk can impact the project schedule and other variables;
- Ongoing risk control is essential;
- Risk register should be updated at every phase of the project lifecycle.

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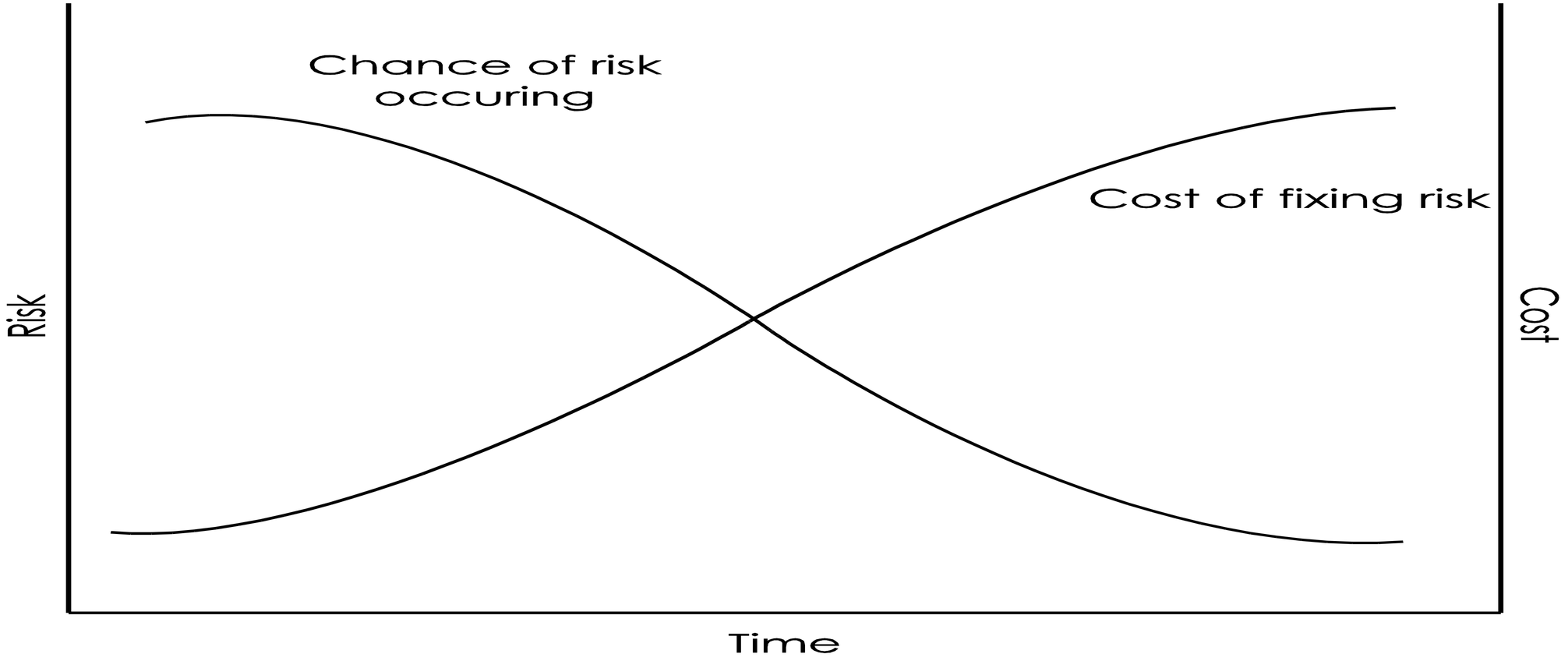
The risk management dilemma



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Management of risks, uncertainties & opportunities on projects – Jaafari, 2001

Project management as a strategy (not simply as planning & execution)

- Recognize & manage proactively project complexity;
- Decision making based on strategic approaches;
- Project lifecycle thinking;
- Include variables in line with TBL.

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Management of risks, uncertainties & opportunities on projects – Jaafari, 2001 ...continues

Identified risk variables

- Promotion risk
- Market/price
- Political
- Technical
- Financial
- Environmental
- Cost estimate
- Schedule
- Operating
- Organizational
- Integration
- Force majeure
- ...

Treatment under the LCPM Model (refer to p. 95 article)

- Remarks

(refer to p. 95 article)

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Risks with global projects

PESTELG framework (in line with TBL)

- Political
- Economic/financial
- Social (including culture, values, language, religion, negative impact on community etc.)
- Technological
- Environmental
- Legal
- Global
- Life cycle thinking
- …

Aligning the risk profile

- Risk averse
  - Low tolerance & ability to accept & manage risk
  - Conservative approach, proven techniques, *distanced from change*
  - Caution is the principal focus

- Risk neutral
  - Dispassionate tolerance & ability to accept & manage risk
  - No defined philosophies, reaction oriented, *measured indifference*
  - Balance is the principal focus

- Risk taking
  - High tolerance & ability to accept and manage risk
  - Challenges current thinking, *innovative* approach
  - Experimentation is the principal focus

Critical thinking question

Reflect on the relationship between change & perceived risk from three different perspectives:

1) Risk averse
2) Risk neutral
3) Risk taking

In which category are you?

Readings week 6

Jaafari A., 2001, Management of risks, uncertainties and opportunities on projects: Time for a fundamental shift, *International Journal of Project Management*, pp 89 – 101

Yen Yng Ling F. and Hoi L., 2006, Risks faced by Singapore firms when undertaking construction projects in India, *International Journal of Project Management*, pp 261 – 270

Yean Yng Ling F., Pheng Low S., Wang S. Q., Lim H. H., 2007, Key project management practices affecting Singaporean firms' project performance in China, *International Journal of Project Management*, pp 59 – 71

Sebenius J., 2002, The hidden challenge of Cross-Border Negotiations, *Harvard Business Review*, pp 76 – 85