Project Risk Management: An Overview

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Dilbert's Take…

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Goals and Objectives

- Project Risk
- Risk Management
- Why Risk Management
- Risk Management Planning
- Identifying & Quantifying Risks
- Response Planning
- Risk Monitoring & Control
- Tools, Tricks and Helpful Links

What is Project Risk?

- An event that, if it occurs, causes either a positive or negative impact on a project
- Keys attributes of Risk
  - Uncertainty
  - Positive and Negative
  - Cause and Consequence

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Risk Management

- Risk management is concerned with identifying risks and drawing up plans to minimise their effect on a project.
- A risk is a probability that some adverse (or positive) circumstance will occur
  - Project risks affect schedule or resources;
  - Product risks affect the quality or performance of the software being developed;
  - Business risks affect the organization developing or procuring the software.

Risk Management Process

- PMBOK ® Definition
  - "The systematic process of identifying, analyzing, and responding to project risk"
- Steps
  - ✓ Risk Management Planning
  - ✓ Risk Identification
  - ✓ Qualitative/Quantitative Risk Analysis
  - ✓ Risk Response Planning
  - ✓ Risk Monitoring & Control

Value From Managing Risks

- Opportunity to move from “fire-fighting” to proactive decision making on the project.
- Better chance of project success.
- Improved project schedule and cost performance.
- Stakeholders and team members better understand the nature of the project.
- Helps define the strengths and weaknesses of the project.

Why Not Risk Management?

- With so much benefit to managing risk, why is it often overlooked? :
  1. The organization is too busy with **real** problems to worry about potential ones,
  2. There is a perception that there is not too much that can go wrong, or
  3. They have a fatalistic belief that not much can be done about risks, or
  4. “Shoot the messenger mentality”; fear that disclosure of project risks will be seen as an indication of project weakness.

Won’t identified risks make the project look bad?

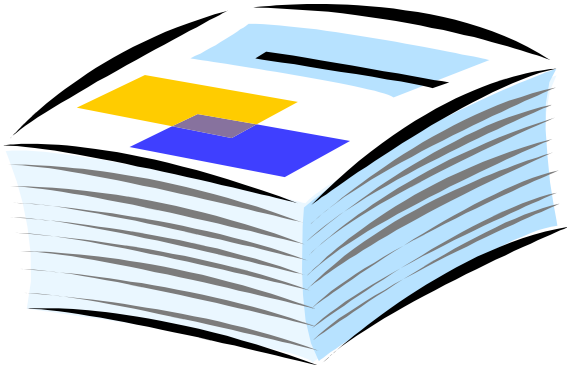
- All projects have risks, denial does not make them go away, it just makes you unprepared for them if they occur.
- Risk in itself is not bad, it is how well the project plans for and reacts to risks that counts.
- Formal risk management is a cornerstone of good project management. Stakeholder visibility into project risks makes it easier to get additional resources and organizational support when risks do occur.

Risk Management Planning

- Plan for the Planning
  - Risk planning should be appropriate for the project
  - Question you should ask:
    1. How risky is the project?
    2. Is it a new technology or something your organization is familiar with?
    3. Do you have past projects to reference?
    4. What is the visibility of the project?
    5. How big is the project?
    6. How important is the project?

The Risk Management Plan

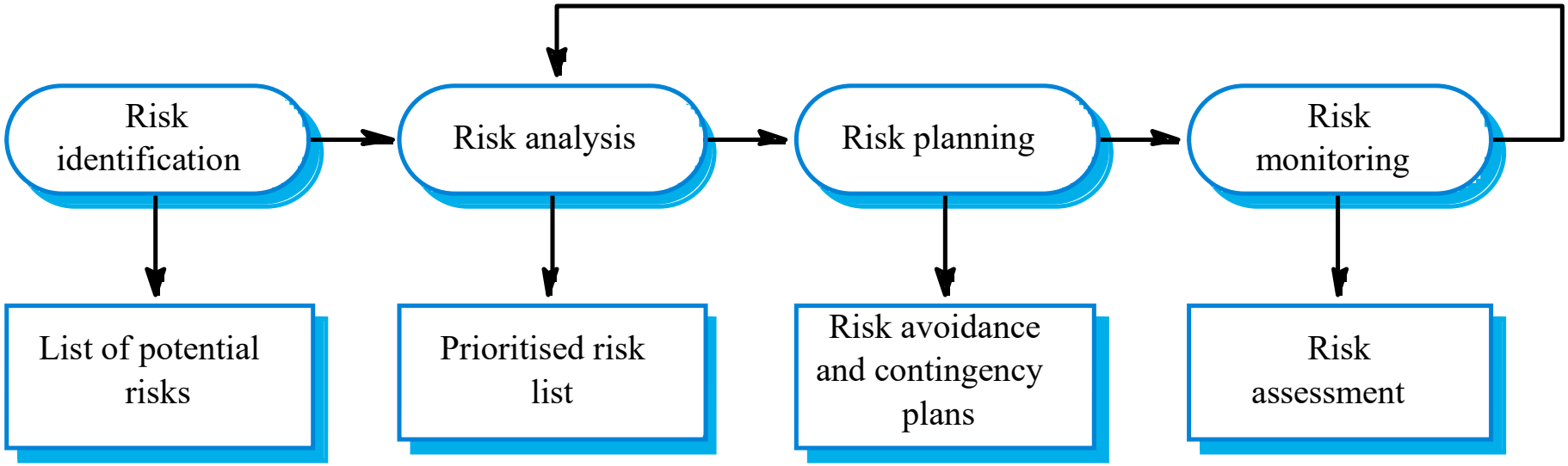
- What should it include?
  - How you will identify, quantify or qualify risk
    - Methods and tools
  - Budget…yes budget
  - Who is doing what
  - How often
  - Risk categories, levels, and thresholds for action.
  - Reporting requirements
  - Monitoring, tracking and documenting strategies



The Risk Management Process

- Risk identification
  - Identify project, product and business risks;
- Risk analysis
  - Assess the likelihood and consequences of these risks;
- Risk response planning
  - Draw up plans to avoid or minimize the effects of the risk;
- Risk monitoring
  - Monitor the risks throughout the project;

The Risk Management Process



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Identifying Risk

- Continuous, Iterative Process
- What is it and what does it look like
- The sooner the better
- The more the merrier
- A fact is not a risk (it's an issue).
- Be specific
- Don't try to do everything at once

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Identification Techniques

- Brainstorming
- Checklists
- Interviewing
- SWOT Analysis (strengths, weaknesses opportunities, threats)
- Delphi Technique (anonymous consensus building)
- Diagramming Techniques
  - Cause & effect
  - Flow Charts
  - Influence Diagrams

Risks and Risk Types

Risk type	Possible risks
Technology	The database used in the system cannot process as many transactions per second as expected. Software components that should be reused contain defects that limit their functionality.
People	It is impossible to recruit staff with the skills required. Key staff are ill and unavailable at critical times. Required training for staff is not available.
Organizational	The organization is restructured so that different management are responsible for the project. Organizational financial problems force reductions in the project budget.
Tools	The code generated by CASE tools is inefficient. CASE tools cannot be integrated.
Requirements	Changes to requirements that require major design rework are proposed. Customers fail to understand the impact of requirements changes.
Estimation	The time required to develop the software is underestimated. The rate of defect repair is underestimated. The size of the software is underestimated.

Software Risks

Risk	Affects	Description
Staff turnover	Project	Experienced staff will leave the project before it is finished.
Management change	Project	There will be a change of organizational management with different priorities.
Hardware unavailability	Project	Hardware that is essential for the project will not be delivered on schedule.
Requirements change	Project and product	There will be a larger number of changes to the requirements than anticipated.
Specification delays	Project and product	Specifications of essential interfaces are not available on schedule
Size underestimate	Project and product	The size of the system has been underestimated.
CASE tool under-performance	Product	CASE tools which support the project do not perform as anticipated
Technology change	Business	The underlying technology on which the system is built is superseded by new technology.
Product competition	Business	A competitive product is marketed before the system is completed.

Risk Analysis

- Assess probability, seriousness, and urgency of each risk.
- Probability may be very low, low, moderate, high or very high.
- Risk effects might be catastrophic, serious, tolerable or insignificant.
- Urgency might be immediate, short term, or long term.

Analyzing Risk - Qualitative

- Subjective
- Educated Guess
- High, Medium, Low
- Red, Yellow, Green
- 1-10
- Prioritized/Ranked list of ALL identified risks
- First step in risk analysis!

Risk Analysis - Quantitative

- Numerical/Statistical Analysis
- Determines probability of occurrence and consequences of risks
- Should be focused to highest risks as determined by Qualitative Risk Analysis and Risk Threshold

Risk Analysis (i)

Risk	Probability	Effects
Organizational financial problems force reductions in the project budget.	Low	Catastrophic
It is impossible to recruit staff with the skills required for the project.	High	Catastrophic
Key staff are ill at critical times in the project.	Moderate	Serious
Software components that should be reused contain defects which limit their functionality.	Moderate	Serious
Changes to requirements that require major design rework are proposed.	Moderate	Serious
The organization is restructured so that different management are responsible for the project.	High	Serious

Risk Analysis (ii)

Risk	Probability	Effects
The database used in the system cannot process as many transactions per second as expected.	Moderate	Serious
The time required to develop the software is underestimated.	High	Serious
CASE tools cannot be integrated.	High	Tolerable
Customers fail to understand the impact of requirements changes.	Moderate	Tolerable
Required training for staff is not available.	Moderate	Tolerable
The rate of defect repair is underestimated.	Moderate	Tolerable
The size of the software is underestimated.	High	Tolerable
The code generated by CASE tools is inefficient.	Moderate	Insignificant

Probability & Impact Analysis

Risk	Probability	Impact	Expected Value
1	25%	$45,000	$11,250
2	50%	$2,000	$1,000
3	30%	$100,000	$30,000

Risk Response Planning

- "What are we going to do about it?"
- Techniques/Strategies:
  - Avoidance – Eliminate it
  - Transference – Pawn it off
  - Mitigation – Reduce probability or impact of it
  - Acceptance – Do nothing
- Strategy should be commensurate with risk
  - Hint: Don't spend more money preventing the risk than the impact of the risk would be if it occurs ☺
- The Risk Response Plan/Risk Response Register

Risk Management Strategies (i)

Risk	Strategy
Organizational financial problems	Prepare a briefing document for senior management showing how the project is making a very important contribution to the goals of the business.
Recruitment problems	Alert customer of potential difficulties and the possibility of delays, investigate outsourcing work.
Staff illness	Reorganize team so that there is more overlap of work and people therefore understand each other's jobs.

Risk Management Strategies (ii)

Risk	Strategy
Requirements changes	Derive traceability information to assess requirements change impact, and maximise information hiding in the design.
Organizational restructuring	Prepare a briefing document for senior management showing how the project is making a very important contribution to the goals of the business.
Database performance	Investigate the possibility of buying a higher-performance database.
Underestimated development time	Investigate outsourcing components, investigate use of a program generator

Risk Monitoring

- Assess each identified risk regularly to decide whether or not it is becoming less or more probable.
- Also assess whether the effects of the risk have changed.
- Each key risk should be discussed at management progress meetings.

Risk Monitoring & Control

- Continuous, Iterative Process
- Done right the risk impact will be minimized:
  - Someone IS responsible
  - Watch for risk triggers
  - Communicate…Communicate…Communicate
  - Take corrective action - Execute
  - Re-evaluate and look for new risk constantly
- Tools:
  - Risk Reviews
  - Risk Audits

Risk indicators

Risk type	Potential indicators
Technology	Late delivery of hardware or support software, many reported technology problems
People	Poor staff morale, poor relationships amongst team member, job availability
Organizational	Organizational gossip, lack of action by senior management
Tools	Reluctance by team members to use tools, complaints about CASE tools, demands for higher-powered workstations
Requirements	Many requirements change requests, customer complaints
Estimation	Failure to meet agreed schedule, failure to fix reported defects

Tools & Tricks

- Risk Identification Spreadsheet
- Risk log Spreadsheet
- Templates
- Make your own

Helpful Links

- Project Management Institute (PMI)
  - www.pmi.org
- CMMI
  - www.sei.cmu.edu/**cmmi**/
- PMI Government SIG
  - www.pmi-govsig.org
- NIH Project Management Center of Excellence
  - http://irm.cit.nih.gov/cio/PMExcellence/

Questions???

Thank You

for the opportunity

to present to you today!

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