Risk Management

Software Process

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Learning Objectives

By the end of this video, you will be able to
• Explain what is risk.
• Explain example harms to stakeholders in software projects.
• Explain what is risk management and steps in risk management.
• Draw a risk table for given risks.
Risk
Potential
Future
Harm
Why People Often Don’t Manage Risk

• Don’t be a negative thinker!
• Don’t raise a problem unless you have a solution for it
• Don’t say something is a problem unless you can prove it is
• Don’t raise a problem unless you want to be responsible for solving it
“Harms” to Stakeholders in Software Projects

- **Customers**
  - Budget overruns, schedule slips, ...

- **Developers**
  - Wrong/unsatisfactory functionality, performance, reliability, safety, ...

- **Users**
  - Poor quality software, ...

- **Support Engineer**
  - Poor quality software, ...
Risk Management

“To identify, address, and eliminate risk items before they become either threats to successful software operation or major sources of software rework.”

(Boehm, 1991)
Steps in Risk Management

Risk Assessment:
- Risk Identification
- Risk Analysis
- Risk Prioritization

Risk Control:
- Risk Monitoring
- Risk Mitigation
- Risk Planning
Steps in Risk Management

Risk Assessment

- Risk Identification
- Risk Analysis
- Risk Prioritization

Risk Control

- Risk Monitoring
- Risk Mitigation
- Risk Planning
Risk Identification

• Lack of communication among team members
• Loss of a team member
• Incorrect understanding of requirements
• Overriding other teammates’ work
• …

(Ladsgroup, 2016)
Steps in Risk Management

Risk Assessment

Risk Identification → Risk Analysis → Risk Prioritization

Risk Monitoring ← Risk Mitigation ← Risk Planning

Risk Control
## Risk Analysis

**Probability of loss, e.g.,**
- 10%: Very improbable
- 40%: Improbable
- 75%: Probable
- 90%: Frequent

**Impact of loss, e.g.,**
- 1: Negligible
- 2: Marginal
- 3: Critical
- 4: Catastrophic

<table>
<thead>
<tr>
<th>Rank</th>
<th>Risk</th>
<th>Probability</th>
<th>Impact</th>
<th>Cost</th>
<th>Risk Exposure</th>
<th>Rank Last Week/#Weeks on List</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Requirement change</td>
<td>90%</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
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Steps in Risk Management

1. Risk Identification
2. Risk Analysis
3. Risk Prioritization

Risk Monitoring

Risk Mitigation

Risk Planning

Risk Assessment

Risk Control
## Risk Prioritization

Cost of the loss to the project, should the risk actually occur

Risk exposure: Probability * Cost

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<tbody>
<tr>
<td>1</td>
<td>Requirement change</td>
<td>90%</td>
<td>3</td>
<td>$5000</td>
<td>$4500</td>
<td>1/4</td>
<td>Bi-weekly deliverables</td>
</tr>
<tr>
<td>2</td>
<td>Loss of a team member</td>
<td>50%</td>
<td>2</td>
<td>$3000</td>
<td>$1500</td>
<td>2/3</td>
<td>Pair programming</td>
</tr>
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Steps in Risk Management

Risk Assessment

Risk Identification → Risk Analysis → Risk Prioritization

Risk Monitoring ← Risk Mitigation ← Risk Planning

Risk Control
Risk Planning

Information Buying

Contingency Plans

Risk Reduction

Risk Acceptance

(Williams, 2013)
Steps in Risk Management

Risk Assessment

Risk Identification → Risk Analysis → Risk Prioritization

Risk Monitoring ← Risk Mitigation ← Risk Planning

Risk Control
## Risk Mitigation

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Example Risk and Action

*Risk: Developers leave the project*

- **XP**: Use pair programming to teach new developers the system and to make sure that knowledge of the system is spread as widely as possible

- **RUP**: Document the architecture and key use cases
Steps in Risk Management

Risk Assessment

- Risk Identification
- Risk Analysis
- Risk Prioritization

Risk Control

- Risk Monitoring
- Risk Mitigation
- Risk Planning
Manage Biggest Risks in Software Projects

*Process should address biggest risks*

- **Wrong**/constantly changing requirements
  - Iterative development
  - Work closely with customer

- **Inadequate** schedule
  - Keep schedule up to date
  - Reduce/prioritize scope
References


The End