Risk Management In Software Intensive Projects

Lecture 2 - Risk Management Process

The Risk Management Process

Agenda
- The Risk Management Process
- A Picture of success
  - Building one
  - Fixing one
- Risk Identification
  - Reasoning
  - Risk statements
  - Exercise
- Risk Analysis
  - Risk Attributes
  - Evolution
  - Classification
  - Prioritization

Picture of Success

Reasoning
- Why would you want to define one?
- Explicit or implicit
- Term?
- Characteristics?
- Measurements?
- Evaluation

Building One
- A minimum set of conditions, that must be met for your project members to consider the project a “success”
- Set for a specific time in the future
- Must be agreed to and measurable
- Building one:
  - Put yourself at the end of the project
  - List those things that would make you believe this was a success
  - Convert those into success statements (e.g., We have done X or have shown that our product has met at least Y)
- Stay within a one slide limit with 4-5 main ones

http://www.sei.cmu.edu/programs/sepm/risk/paradigm.html
Examine the following statements.

*Good! Bad? In need of a quick fix?*

We deliver the "must have" requirements as agreed by us and the client by the end of the summer semester with the levels of quality specified by the client.

The team shares the workload evenly and collaboratively throughout the project and resolves conflict through timely team communication.

We have a designated process that is thoroughly documented and followed throughout the project.

We periodically, at a minimum once a semester, review our actions and processes so as to identify actions that get implemented in the next phase.

We are able to articulate core principles in the areas of people, process, and technology, and reflect on having used them in our Studio project so as to understand our successes and failures and react accordingly.

Some Questions

- Why keep track of risks in a statement format?
- What would you want such a risk statement to contain?
- Why is the "IF...THEN" construct a little problematic?
There is water on the hall floor; someone might slip in it and get hurt.

Risk Statements Exercise

Turn these into risk statements

Statement #1

Most of our team members work very late hours. They don’t sleep well at night worrying about the work they did not complete and when they come to work next morning they are usually tired. Their families are also upset with them and so the overall morale in the team is down.

Statement #2

We don’t know what to do about our client. He still has not seen our prototype and we need the feedback to continue working on the prototype.

Risk Analysis
Risk Attributes

- Understand risk better by determining its impact, probability and time frame.
  - Generate values for:
    - Impact – The potential loss or the effect on the project if the risk occurs
    - Probability – The likelihood that this risk would occur
    - Time Frame – The period of time left until this risk should be addressed.

Various Levels of Evaluation

<table>
<thead>
<tr>
<th>Level</th>
<th>Impact</th>
<th>Probability</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Binary</td>
<td>High</td>
<td>Likely</td>
<td>Significant</td>
</tr>
<tr>
<td>3-Level</td>
<td>High-Moderate</td>
<td>Moderate</td>
<td>Near</td>
</tr>
<tr>
<td>5-Level</td>
<td>Very High</td>
<td>Very High</td>
<td>Imminent</td>
</tr>
<tr>
<td>N-Level</td>
<td>No levels of impact</td>
<td>No levels of probability</td>
<td>No levels of time frame</td>
</tr>
</tbody>
</table>

Risk Exposure

- **Impact**
  - Catastrophic
  - Critical
  - Marginal
  - Negligible

- **Probability**
  - Frequent
  - Probable
  - Improbable

![Risk Exposure Diagram](image)

Possible Definitions

- **Impact**
  - Catastrophic
  - Critical
  - Marginal
  - Negligible
- **Probability**
  - Very likely >70% 
  - Likely =50%
  - Not likely <30%
- **Timeframe**
  - Near term – Within a month or so
  - Mid term – within three months or so
  - Long term – within six months or so

Risk Classification

- **Why classify risks?**
  - To look at how risks relate to one another
  - To sort through large quantities of data
  - Eliminate any duplicates
  - Use resources more efficiently
- **Two general options exist**
  - Self organized structure
    - Example – Affinity Grouping
  - Predefined structure
    - Software development risk taxonomy
Risk Prioritization

- Figuring out which ones are most important
- Establishing which risks should be dealt with first
- Possible techniques
  - Pareto top N risks
  - Multivoting
  - Comparison risk ranking

Risk Prioritization

- Pareto Top N
  - Calculate Risk Exposure
  - Rank all the risks
  - Decide on a cut-off mark
  - This method is
    - Easy
    - Straightforward
    - Not resource intensive

Risk Prioritization

- Multi-voting
  - Comparison Risk ranking (CRR)
    - Comparison question: Which Risk is more important for the Project?
    - Use for:
      - Small number of risks
      - No need for degree of preference
      - Note that this is time-consuming

Risk Prioritization

- Integration
  - To select from a small-mid size list <50
- Multivoting
  - To select the most important risks from a list
- COTS
  - To select from a small-mid size list <50

Risk Prioritization

- Pareto Top N
  - Risks
  - Total Points
  - Cronos
  - CRM Guidebook p.392
  - Pareto Top N risks
  - Comparison risk ranking
  - Calculate Risk Exposure
  - Rank all the risks
  - Decide on a cut-off mark
  - This method is:
    - Easy
    - Straightforward
    - Not resource intensive
Better understand the risks
Select relevant levels of attributes for your project
Condition, consequence (at least one of each)
Are clear, concise, fact based and actionable
Don’t forget the risk statement context
It provides relevant additional information
It keeps the original intent of the risk so that others can understand it if need be later on
Select relevant levels of attributes for your project
Classify and prioritize risks to
Better understand the risks
Understand what needs immediate attention
Communication is essential to facilitate identification, classification and prioritization

Start your project with defining a picture of success
When creating risk statements, remember that good ones contain
Ones contain
Questions?