Risk Management

Lecture 18

Risk Managment

A risk is a potential problem – it might happen and it might not

Conceptual definition of risk

- Risk concerns future happenings
- Risk involves change in mind, opinion, actions, places, etc.
- Risk involves choice and the uncertainty that choice entail

Risk Categorization – Approach #1

Project risks

- They threaten the project plan
- If they become real, it is likely that the project schedule will slip and that costs will increase

Technical risks

- They threaten the quality and timeliness of the software to be produced
- If they become real, implementation may become difficult or impossible

Business risks

- They threaten the viability of the software to be built
- If they become real, they jeopardize the project or the product

Risk Categorization

Sub-categories of Business risks

- **Market risk** – building an excellent product or system that no one really wants
- **Strategic risk** – building a product that no longer fits into the overall business strategy for the company
- **Sales risk** – building a product that the sales force doesn't understand how to sell
- **Management risk** – losing the support of senior management due to a change in focus or a change in people
- **Budget risk** – losing budgetary or personnel commitment

Risk Categorization – Approach #2

- Known risks
  - Those risks that can be uncovered after careful evaluation of the project plan, the business and technical environment in which the project is being developed, and other reliable information sources (e.g., unrealistic delivery date)
- Predictable risks
  - Those risks that are extrapolated from past project experience (e.g., past turnover)
- Unpredictable risks
  - Those risks that can and do occur, but are extremely difficult to identify in advance

Reactive vs. Proactive Risk Strategies

- Reactive risk strategies
  - "Don't worry, I'll think of something"
  - The majority of software teams and managers rely on this approach
  - Nothing is done about risks until something goes wrong
    - The team then flies into action in an attempt to correct the problem rapidly (fire fighting)
  - Crisis management is the choice of management techniques
- Proactive risk strategies
  - Steps for risk management are followed
  - Primary objective is to avoid risk and to have a contingency plan in place to handle unavoidable risks in a controlled and effective manner

Steps for Risk Management

1) Identify possible risks; recognize what can go wrong
2) Analyze each risk to estimate the probability that it will occur and the impact (i.e., damage) that it will do if it does occur
3) Rank the risks by probability and impact
   - Impact may be negligible, marginal, critical, and catastrophic
4) Develop a contingency plan to manage those risks having high probability and high impact

Seven Principles of Risk Management

1. **Maintain a global perspective**
   1. View software risks within the context of a system and the business problem that is is intended to solve
2. **Take a forward-looking view**
   1. Think about risks that may arise in the future; establish contingency plans
3. **Encourage open communication**
   1. Encourage all stakeholders and users to point out risks at any time
4. **Integrate risk management**
   1. Integrate the consideration of risk into the software process
5. **Emphasize a continuous process of risk management**
   1. Modify identified risks as more becomes known and add new risks as better insight is achieved
6. **Develop a shared product vision**
   1. A shared vision by all stakeholders facilitates better risk identification and assessment
7. **Encourage teamwork when managing risk**

   Pool the skills and experience of all stakeholders when conducting risk management activities

Risk Projection/Estimation Steps

1) Establish a scale that reflects the perceived likelihood of a risk (e.g., 1-low, 10-high)
2) Delineate the consequences of the risk
3) Estimate the impact of the risk on the project and product
4) Note the overall accuracy of the risk projection so that there will be no misunderstandings

Contents of a Risk Table

A risk table provides a project manager with a simple technique for risk projection

It consists of five columns

- Risk Summary – short description of the risk
- Risk Category – one of seven risk categories (slide 8)
- Probability – estimation of risk occurrence based on group input
- Impact – (1) catastrophic (2) critical (3) marginal (4) negligible
- RMMM – Pointer to a paragraph in the Risk Mitigation, Monitoring, and Management Plan

Risk Summary	Risk Category	Probability	Impact (1-4)	RMMM

Developing a Risk Table

- List all risks in the first column (by way of the help of the risk item checklists)
- Mark the category of each risk
- Estimate the probability of each risk occurring
- Assess the impact of each risk based on an averaging of the four risk components to determine an overall impact value (See next slide)
- Sort the rows by probability and impact in descending order
- Draw a horizontal cutoff line in the table that indicates the risks that will be given further attention

Assessing Risk Impact

Three factors affect the consequences that are likely if a risk does occur

- **Its nature** – This indicates the problems that are likely if the risk occurs
- **Its scope** – This combines the severity of the risk (how serious was it) with its overall distribution (how much was affected)
- **Its timing** – This considers when and for how long the impact will be felt

Assessing Risk Impact

The overall risk exposure formula is RE = P x C

- P = the probability of occurrence for a risk
- C = the cost to the project should the risk actually occur

Example

- P = 80% probability that 18 of 60 software components will have to be developed
- C = Total cost of developing 18 components is $25,000

RE = .80 x $25,000 = $20,000

The RMMM Plan

- The RMMM plan may be a part of the software development plan or may be a separate document
- Once RMMM has been documented and the project has begun, the risk mitigation, and monitoring steps begin
  - Risk mitigation is a problem avoidance activity
  - Risk monitoring is a project tracking activity
- Risk monitoring has three objectives
  - To assess whether predicted risks do, in fact, occur
  - To ensure that risk aversion steps defined for the risk are being properly applied
  - To collect information that can be used for future risk analysis
- The findings from risk monitoring may allow the project manager to ascertain what risks caused which problems throughout the project

Summary

Whenever much is riding on a software project, common sense dictates risk analysis

Yet, most project managers do it informally and superficially, if at all

However, the time spent in risk management results in

- Less upheaval during the project
- A greater ability to track and control a project
- The confidence that comes with planning for problems before they occur

Risk management can absorb a significant amount of the project planning effort…but the effort is worth it

Thank You