Risk Management

Strategies for Making Decisions
17 November 2009
Part 1: General Risk Management

• Risks are typically multi-dimensional
• Specific interactions may impact risk assessment
  – Relationship between deadline and investment cost
  – Relationships between several risk factors
• Risks are not limited to time and money
  – Project Risks (threaten the project plan)
  – Technical risks (quality, schedule)
  – Business Risks (market, sales, budget, strategic position)
  – Personal Risks (finances, family, health)
  – Product-Specific Risks and Generic Risks
Some Risk Interaction Examples

- Time --- Money --- Competition --- Delivery Failure:
  Ready for Xmas Season --- $95K manpower cost --- Estimated 50% loss in total sales

- Social Impact --- Operational Need --- Development Cost:
  Family Medical Bills --- Current Operational Margins --- Investment cost for equipment

- Performance --- Cost --- Support --- Schedule

- Scope --- Staffing --- Customer Expectations
Assessing Risk

• Identify Each Risk Element
  – Generic (e.g., by categories as discussed on previous slide)
  – Product-Specific (e.g., level of expertise required vs expertise at hand)
  – Known (based on formal evaluation, expert information)
  – Unknown (past experience + best guess at what might go wrong)
  ✓ Create a check-list of the risks

• Quantify
  – Establish a scale that reflects the risk probability (Ex: 1-low to 5-high)
  – Specify consequences
  – Estimate impact on project and/or product
  – Assign Level-of-Confidence for each quantified risk
  – Have cost data ready for risk exposure estimation

• Assess
  – Estimate probability each will occur
  – Estimate impact of each risk on overall success
  – Estimate impact of various risk combinations on success
    • Some combinations are deadlier than others
  – Sort the risks by probability and impact
Risk Exposure

• Estimate Risk Exposure (RE) for each risk/combination
• R.E. = Risk Probability X Cost
• Costs are based on known factors:
  – Average time to code solution X average cost/developer hour
  – Current per-DVD distribution costs
  – Per-GB bandwidth cost from network provider
  – Etc....
• Costs can reflect money lost or price to fix problem
• Costs are usually best-estimate, rarely absolute price
• Cf. slides 17-23 from Chapter 28 (publisher’s slides)
True Tales

• 3 true stories (companies and people disguised)
  – 3 brothers build a software business & sell for over $50M
  – 4 friends build a software business and sell for $5M
  – 2 brothers build a software-driven manufacturing improvement device (still in business)

• Examined from the following risk points:
  – Product Size
  – Business Impact
  – Customer Risk
  – Technology Risk
  – Staff/People Risk
  – Financial Risks

• Different paradigms but similar opportunity-drivers
  – Emerging/maturing technology + immediate, dramatic cost-savings for customers + unique market position
Part 2: Software Development Risk Management

- Factors similar to general risk management
- Proactive and Reactive Strategies
  - Figure out what can go wrong and a reasonable solution/prevention
  - Figure out what did go wrong and how to recover
- For each factor:
  - Estimate probability
  - calculate cost
  - assess risk
- Monitor status of each
  - Note adverse changes
  - Add new/unexpected factors as they arise
  - Regularly re-evaluate risk exposure
Classic Factors Relating to Programming

• Schedule
  – Time to market is *everything*
  – Plan for shortest path to good-enough release

• Requirements Creep
  – Possible to do <> Should be done
  – Income generation from good-enough product on the shelves can finance development of more features for next release

• Tool Chain
  – Should provide a clear advantage (Ex: faster; easier; well-understood; easy to hire)
  – Should meet all development needs (Ex: special libraries; debug tools; testing tools; platform compatibility)
  – Should support a test-based methodology

• Code Complexity
  – Product components can be classified by easy, moderate, hard
  – *Do the hard stuff first!*
  – Do the easy stuff last
  – Double-check your component classification (did you classify each correctly?)
SW Project Management

• Common methods established for managing software projects
• Once a team grows beyond a few people, some formalized management will help keep project on track
• The larger the team, the more critical the PM tools will be to success
• Example of tool set that operates like many of those used in big business:

http://www.pragmaticsw.com/Movies.asp?Topic=OverviewSoftwarePlanner