Unit-1&5
Risk Management

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Outline

- Risk analysis and management are actions that help a software team to understand and manage uncertainty.
- Topic to cover :
  1. Risk strategies.
  2. Software risks.
  3. Risk Identification : Assessing Overall Project Risk, Risk Components and Drivers
  4. Risk projection : Developing a Risk Table, Assessing Risk Impact
  5. Risk Mitigation, Monitoring, and Management.
  6. Risk information sheet

Risk Strategies

1. Reactive risk strategy - the team flies into action in an attempt to correct the problem rapidly. This is often called a fire-fighting mode.
2. Proactive risk strategy - Potential risk are identified and ranked to manage risk. Contingency plan is enabled to respond the risk in a controlled and effective manner.

Software Risk

1. Project risks threaten the project plan risk factors are project schedule slippage, increase in costs, and estimation (project complexity, size, the degree of structural uncertainty).
2. Technical risks threaten the quality and timeliness of the software to be produced risk factors are potential design, implementation, interface, verification, and maintenance problems, specification ambiguity, technical uncertainty, technical obsolescence, and leading-edge technology.
3. Business risks threaten the viability of the software to be built and often jeopardize the project or the product risk factors are market risk, strategic risk sales risk, management risk budget risks.
4. Known risks are those that can be uncovered after careful evaluation of the project plan risk factors are unrealistic delivery date, lack of documented requirements or software scope, poor development environment.
5. Predictable risks are extrapolated from past project experience risk factors are staff turnover, poor communication with the customer, dilution of staff effort as ongoing maintenance requests are serviced.
6. Unpredictable risks are the joker in the deck. They can and do occur, but they are extremely difficult to identify in advance.

Risk Identification

1. Risk identification is a systematic attempt to specify threats to the project plan.
2. Two distinct types of risks - generic risks and product-specific risks.
3. Checklist method to identify risk. Based on the following subcategories: Product size, Business impact, Stakeholder characteristics, Process definition, Development environment, etc.
4. Questions and answers allow you to estimate the impact of risk.

Risk Components and Drivers

- Risk components - Performance risk, cost risk, support risk and schedule risk.
- Risk drivers - negligible, marginal, critical, or catastrophic

Assessing Overall Project Risk

- Questions - Have customers been involved fully in the definition of requirements? Does the software engineering team have the right mix of skills? Does the project team have experience with the technology to be implemented?
- If the questions is answered negatively, mitigation, monitoring, and management steps should be instituted without fail.

Components			
Performance	Support	Cost	Schedule

Risk Projection / Estimation

1. Rate each risk in two ways - Probability of occurance and Impact of risk
2. Use the impact assessment table

Developing a Risk Table

- Risk table provides a simple technique for risk projection.
- Risk table represents risk name, risk category(business, project size risk, etc.),probability of occurance risk, impact assessed based on components (performance, support, cost and schedule)
- Risk prioritization- high prob and high impact on top.

Assessing Risk Impact

- Risk exposure,RE=P x C where P is the probability of occurrence for a risk, and C is the cost to the project should the risk occur.

Risk Estimation- case study

- P=80 percentage, 18 components(new to develop), average LOC per component =100 LOC, cost= $14 per LOC, overall impact = 18 x 100 x 14 =$25, 200/-
- RE=.80 x 25200=$20,160/-

Fig: risk table

Risks	Category	Probability	Impact	RMMM
Size estimate may be significantly low	PS	60%	2	
Larger number of users than planned	PS	30%	3	
Less reuse than planned	PS	70%	2	
End-users resist system	BU	40%	3	
Delivery deadline will be tightened	BU	50%	2	
Funding will be lost	CU	40%	1	

Risk information sheet

Risk information sheet			
Risk ID: P02-4-32	Date: 5/9/09	Prob: 80%	Impact: high

Description:
Only 70 percent of the software components scheduled for reuse will, in fact, be integrated into the application. The remaining functionality will have to be custom developed.

Refinement/context:
Subcondition 1: Certain reusable components were developed by a third party with no knowledge of internal design standards.
Subcondition 2: The design standard for component interfaces has not been solidified and may not conform to certain existing reusable components.
Subcondition 3: Certain reusable components have been implemented in a language that is not supported on the target environment.

Mitigation/monitoring:
1. Contact third party to determine conformance with design standards.
2. Press for interface standards completion; consider component structure when deciding on interface protocol.
3. Check to determine number of components in subcondition 3 category; check to determine if language support can be acquired.

Management/contingency plan/trigger:
RE computed to be $20,200. Allocate this amount within project contingency cost. Develop revised schedule assuming that 18 additional components will have to be custom built; allocate staff accordingly.
Trigger: Mitigation steps unproductive as of 7/1/09.

Current status:
5/12/09: Mitigation steps initiated.

Originator: D. Gagne	Assigned: B. Laster

Summary

1. Different types of Software risks.
2. Checklist risk identification method.
3. Risk Estimation.
4. Prepare a risk table
5. Compute risk exposure.

References I

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Seventh Edition, McGraw Hill Higher Education, 2010.