INFO3333
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Module 4 Lecture:
Risk Management

based on slides by Dr Rabiul Hasan and Prof Alan Fekete

First: reminder about Colesworth requirements

Ask questions on Ed to the “Colesworth” stakeholders, to clarify requirements

Make sure your requirements format matches your project approach

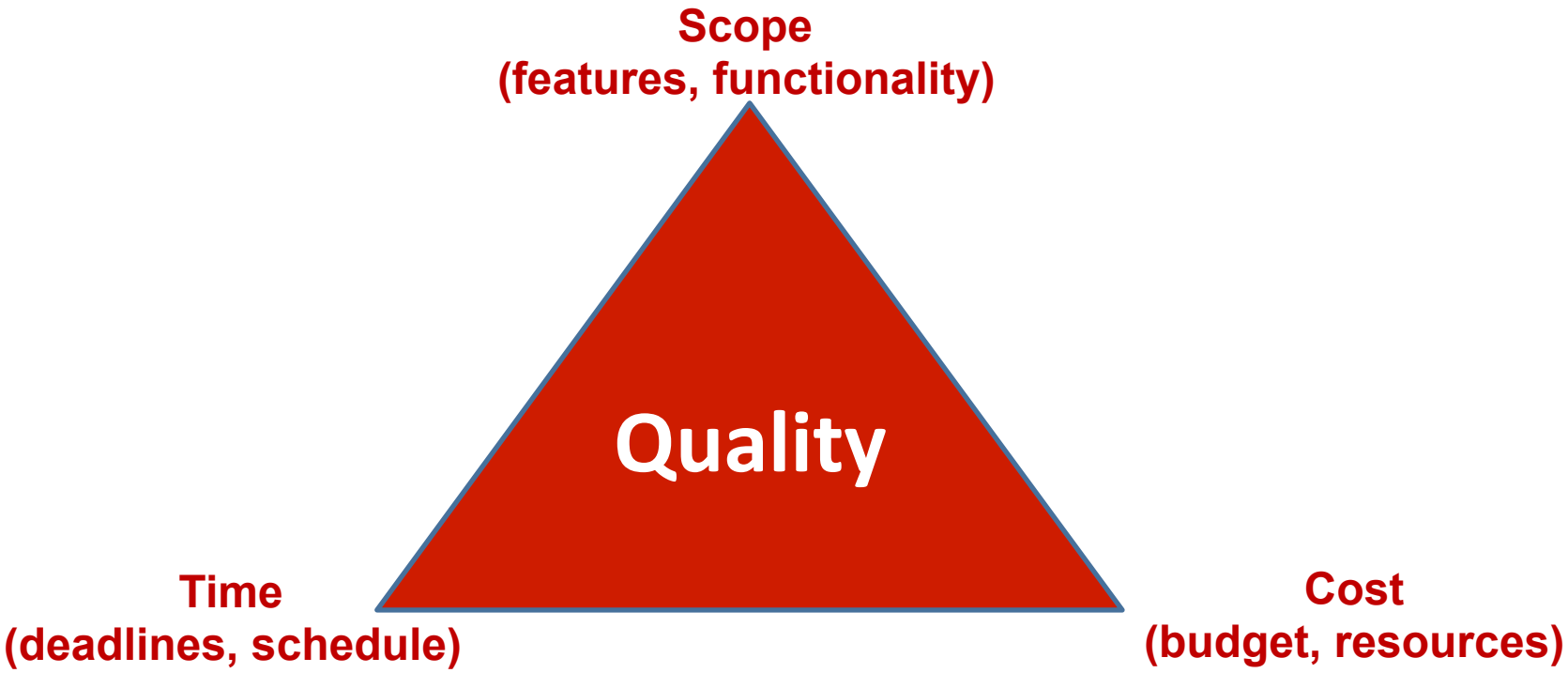
eg don’t produce long requirements list as word document, for XP!

Learning objectives

- Terminology
- PMBOK approach to risk management
- Agile approach to risk management
- Comparing PMBOK and Agile approaches

Recall: What makes projects hard?

- "Triple constraint"



Define Project Risk

- Project risk is “an uncertain event or condition that, if it occurs, has a positive or negative effect on a project's objectives.” [PMBOK]
  - a key aspect: it may occur, it may not occur, no-one knows yet
  - a key aspect: if it occurs, there is effect on the project performance
    - note: effect may be on what is delivered, or on schedule, cost, quality, etc
    - note: effect may be positive (“opportunity”) or negative (“threat”)
- Contrast with general definition of risk “the possibility of losing something of value”
  - [from https://en.wikipedia.org/wiki/Risk]

Importance of risk handling

- An essential role of project management is to try to deliver the project objectives despite the uncertainty in what happens
- People are typically not good at
  - predicting uncertain events
  - making decisions involving uncertainty
  - making changes “on-the-fly”
- So risk management attempts to be systematic about it, and also to plan ahead

Risk register

- A document that records potential risk events and related information
  - often presented as a table or speadsheet
- This keeps evolving through the risk management processes
  - new risks identified
  - more about each risk decided

Risk register columns

- For each risk event, the risk register might be structured as follows
  - identifier
  - name
  - description
  - category
  - trigger (signs or symptoms that detect that the event actually occurs)
  - frequency
  - impact
  - potential responses
- Note: PMBOK does not define which columns are to be used

Contingency

- To respond well when a risk event does occur, it helps to have some extra capacity
- It is common to set aside some budget, resources, slack in the deadlines etc, to use if a negative risk actually occurs
  - Contingency reserves are money set aside
  - Buffer (contingency time) is included in schedule to allow for delays
  - Contingency plans are advance decisions about actions to take
- While each individual risk event is uncertain, one can expect in a large project that some of them will occur

PMBOK Risk management processes

- Plan risk management
- Identify risks
- Perform qualitative risk analysis
- Perform quantitative risk analysis
- Plan risk responses
- Implement risk responses
- Monitor risks

Plan risk management

- Decide how one will do the risk management activities for the project
  - who decides, how documented, how modified
  - especially, what level of risk is acceptable
- Typically, a larger organization has standard approach, standard documents

Identify potential risks

- Determine potential risks, and document their characteristics
- How?
  - look at similar previous projects
    - interview about what happened, or might have happened
    - adapt their risk register
  - brainstorm
    - use structured techniques (eg multiround, Delphi) to reduce "groupthink"
    - [see https://en.wikipedia.org/wiki/Delphi_method]

Categories of risk

- Market risks
- Financial risks
- Technology risks
- People risks
- Process risks
- Partner risks
- Government risk
- etc

Perform qualitative risk analysis

- Prioritize risks based on
  - frequency (also called probability, likelihood): how rare or common would this be
  - impact when it occurs: how much the project outcomes would be changed
- Qualitative analysis: assign values for each aspect on a simple, imprecise scale
  - eg (low, medium, high)
  - can also be integers eg (1, 2, 3, 4 or 5) but the numbers are just symbols for an ordered scale, don't try to add them etc

Risk matrix

- The importance of a risk depends on both frequency and impact
  - and defines what sorts of strategy to use in dealing with it, eg who needs to be notified
- Most organizations have a standard scale (for that organization!) to combine these aspects, such as

Impact-> Frequency ↓	Negligible	Marginal	High	Huge
Rare	Low	Low	Medium	Medium
Sometimes	Low	Medium	Medium	Major
Common	Low	Medium	Major	Extreme

Perform quantitative risk analysis

- Prioritize by getting reasonably accurate values for frequency (eg 1 in 20 projects) and impact (eg if it occurs, we lose $5million)
  - this is amazingly hard to do!
  - expected impact = (probability event occurs) times (impact when it occurs)

Plan risk responses

- Build activities into the project plan, to try and achieve outcomes despite possible events
  - make these plans based on the risks that were identified in the risk register
    - type of response (and available budget etc) typically varies according to risk importance
  - some are activities put in the plan to be done before the potential event (eg to reduce the severity)
  - some are contingent activities, planned to be done if/ when the event actually happens

Possible response strategy (negative risk)

- Risk avoidance *[very hard to do]*
  - try to rearrange project so that risk will not be able to occur
- Risk mitigation *[most common and useful in practice]*
  - try to rearrange the project to reduce importance (by reduce frequency, or reduce impact, or both)
- Risk acceptance
  - take no action, just recognize that risk may occur and if so, it will have impacts on project
- Risk transfer
  - find someone else to take on responsibility or bear the consequences for the risk (eg buy insurance, outsource with contractual protections)
- Risk escalate
  - notify higher managers, and let them deal with it

Possible response strategy (positive risk)

- Risk exploitation
  - when event does occur, magnify the benefits
- Risk enhancement
  - increase importance, by increase frequency or increase impact
- Risk sharing
  - allow third party to have some of the benefits
- Risk acceptance
  - take no actions, just enjoy the effect on improved outcome
- Risk escalation
  - notify higher managers to take decisions

More terminology

- Residual risk: a risk that remains after all the response strategies have been included in the plan
- Secondary risk: risk that arises as a result of implementing a risk response

Implement risk responses

- When a risk event does occur during the project, act as planned
  - eg adjust resources, change sequence or even choice of subsequent tasks, notify higher managers, etc
- Always, look for lessons learned, and record them

Monitor risks

- As the project is happening, risk register is continually revised
- Look to see whether identified risk occurs
  - if it is no longer possible, mark as “did not occur”
  - if impact or frequency judgements change (due to changed state of the project), adjust risk register and reconsider plans
- Look to see if other situation arises, not previously identified, that is impacting on project success

Agile approach to risk management

- Agile focus on always having some useful product -> mitigates many risks
- Agile focus on close involvement of stakeholders -> response tries to be what the customer wants at the time

Compare PMBOK and agile approaches

- Both recognize the reality of uncertain events, and both expect that change will happen
  - PMBOK tries to plan, and also plan for change
  - agile tries to avoid planning for things that may not be needed, instead focus on responding quickly and flexibly to whatever happens
  - PMBOK typically responds by adjusting schedule/budget and maintaining scope vs agile adjusts scope while maintaining schedule/budget
  - agile may be especially vulnerable to people risks, due to its focus on trusting the craftspeople and stakeholder representatives
  - PMBOK may be especially vulnerable to requirements or environment changes

Risks of risk management

- Having detailed plans and processes often leads people to feel overconfident that they are going to respond well
  - precision is often false
  - when unexpected events occur, they may be "forced into" standard patterns
- People are bad at thinking about uncertainty!

Key knowledge (quiz, exam!)

- Definition and importance of risk
- Terminology
- PMBOK risk documents
- PMBOK risk processes
- Agile approach to risk
- Comparison of PMBOK and agile approaches