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lecture 18
software development planning

csc302h

winter 2014

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recap from last time

- discussed the top-10 essential practices for software development:
  1. source code control
  2. issue tracking
  3. build automation
  4. automated regression tests
  5. **release planning**
  6. design specifications
  7. architecture control
  8. effort tracking
  9. process control
  10. business planning

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today

software development planning

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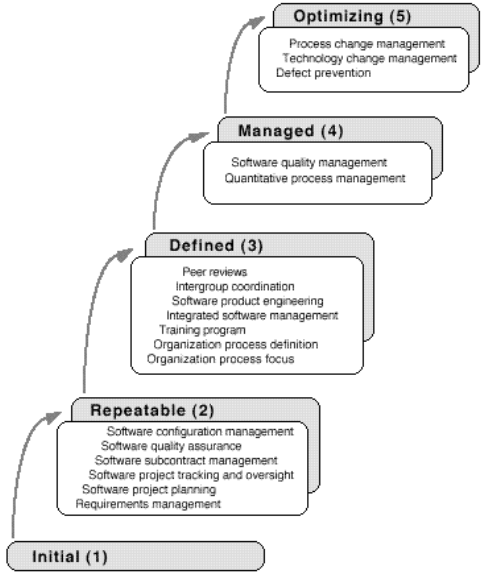
capability maturity model

- classifies an organization's maturity into 5 levels
  - each level prescribes a group of practices
  - CMM is also a road to process improvement
  - must have all lower-level practices in place before attempting next level
- can be certified to a certain CMM level
  - some similarities to ISO 9000
  - not universally agreed to be a good thing, but is an interesting exercise

capability maturity model (2)

capability maturity model (3)



relationship to ISO 9000

- ISO 9000 is a set of quality standards
  - subset of these are specific to software
  - must document the process
  - must maintain "quality records"
    - used in audits to ensure adherence to the process
  - process can be anything

relationship to top-10

- top-10 practices are necessary to achieve CMM level 2 (repeatable)
- also, top-10 includes enough level 3 (defined) stuff to attain ISO 9000 certification
- and, top-10 even include some level-4 (quantitatively managed) stuff, where most useful
  - defect arrival/departure rates
  - estimate vs. actuals

planning

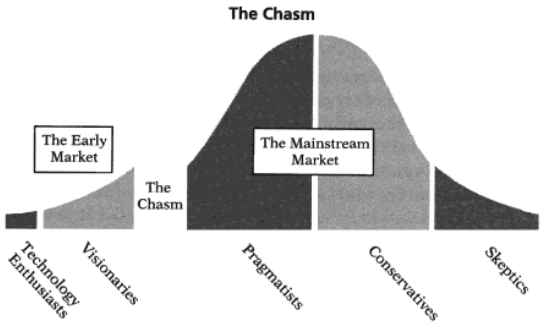
- planning is the most important aspect of CMM Level 2
- common flaws regarding planning
  - making no plans!
  - make a plan, but don't track it
  - attempt to track the plan with inadequate tools
    - Gantt charts
    - Microsoft Project

why plan?

- planning isn't *always* a good thing
  - release/expected date is not important
  - no expectations on new functionality
  - proof-of-concept (a.k.a. "spike")
- planning is required when external pressures come to bear on feature availability dates
- doesn't usually apply to first releases, but is necessary to "cross the chasm"

crossing the chasm

- book by Geoffrey Moore (1991)



planning essentials

What are we building?
By when will it be ready?
How many people do we have?

- answer these questions, and nothing more
  - not "who will be doing what?"
  - not "what are the detailed tasks required?"
  - not "in what order must the tasks be performed?"

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implementation plans

- once initial planning is complete we can transition to a more detailed development plan
- this more detailed plan sorts out:
  - who is assigned to what
  - dependencies between features
  - etc.

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of mice and men

"The best-laid schemes o' mice an' men Gang aft agley"
– Robbie Burns

- the essence of planning is uncertainty
  - plans never "according to plan"
  - must embrace change rather than resisting it
- how to make plans **and** embrace change?
  - track the plan constantly, not just at the start
  - react quickly & decisively to adverse situations
  - embrace a change in direction
  - re-plan quickly, can't be hard to deal with unexpected changes

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internal changes

- estimation errors
  - initial estimates contain a significant (usually one-sided) margin of error
  - as plan progresses, and more information becomes available, variance in errors drops
- developer availability changes
  - illness, parental leave, resignations, cut backs, unexpected vacation plans, unexpectedly low hours of work, unexpected low productivity

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external changes

- new (big) customer with specific demands
- pressure from competition
- collaboration opportunities
- acquisitions & mergers
- sudden changes in customer needs
  - ex. regulatory changes that affect them

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the difficult question

- what are we building?
  - hard for 1st release, later ones have big wish list
  - marketing/product manager pick ones that will get most sales
- by when will it be ready?
  - too soon: customers won't be ready, won't want to learn, install, pay for it
  - too late: competition will pass you, customers will forget you == forgone revenue
- how many developers?
  - usually fixed for a given release, or planning horizon

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the difficult question (2)

What are we building?
By when will it be ready?
How many people do we have?

the difficult question is:

can we do all 3 at once?

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a common problem

- often organizations will answer all 3 questions, but not address the difficult one
- development mgmt. wants to please the rest of the company and agrees to too much – gung-ho spirit!
  - some actually believe in over-commitment to boost productivity – "it's a stretch, but we'll pull it off!"
- developers will say "it can't be done!" – but that's all those folks ever say, right?

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a common problem (2)

- major state of denial sets in…
  - or sometimes hopeless optimism
  - everybody is secretly hoping for a miracle
- nobody will accept any blame, and why should they?
  - dev. mgmt.: "we told you it was a stretch!"
  - developers: "we said it couldn't be done!"
  - marketing & sales: "R&D, should have said something earlier!"
  - CEO: "you all told me everything was fine!"
  - Yourdon's death march…

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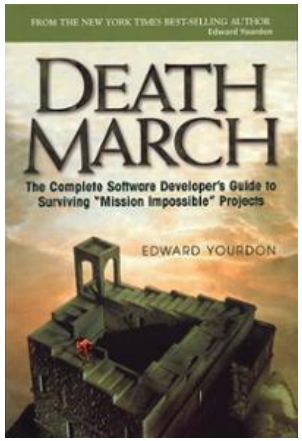
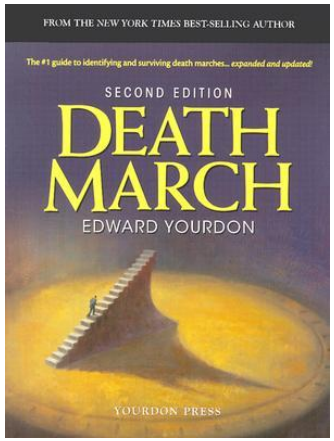
a common problem (3)

- *Death March* – Edward Yourdon





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the solution – good planning

- the "*death march*" doesn't need to happen
- to avoid it we need some courage and conviction
- also need common sense:
  - is it even feasible to do what's asked by the date required?
  - don't give a quick (off-the-cuff) answer even if it's obviously impossible
  - put together a plan to demonstrate the facts.