Final Exam

- Comprehensive
- In-class
- Final is 3:45-6:45, April 27, Thursday

Refs

1. [http://www.agilealliance.org](http://www.agilealliance.org)
   - Agile alliance manifesto:
     - Individuals and interactions over processes and tools
     - Working software over comprehensive documentation
     - Customer collaboration over contract negotiation
     - Responding to change over following a plan
   - XP series of books from Addison-Wesley
     - McBreen: Questioning Extreme Programming
Topic: Views on Extreme Programming (XP)

- Positive
  - Loved by programmers
  - Factor 6 improvement in productivity!
  - No documentation needed: code is documentation
    - If not, bad code. Recode.
- Negative
  - Glorifies "cowboy coders"
  - Hackers paradise
  - Sets software engineering back 30 years!
  - I.e., lots of flame wars!

Agile Programming

- Small agile team – 5 to 10
  - Dominated by people with extensive project experience
  - Can only tolerate a few inexperienced enthusiastic beginners
- Regular delivery schedule – incremental system delivered to customer every few weeks
- Customer co-located with development team
- Customer decides what to include in next increment
  - "Must have," "should have," "can have"
  - With advice from team (feasibility, difficulty)

XP & CMM Characterizations - 1

- In 60’s, big software systems were replacing existing manual systems
  - What was needed was pretty well understood—relatively speaking
- Today’s systems (web apps, e.g.) are fundamentally different.
  - Many requirements cannot be known at start
CMM & XP characterizations – 2 (as seen by XP advocates)

- CMM designed by managers
  - Addresses management needs.
  - Traditional SE processes minimize risk of making mistakes even at cost of proceeding at glacial pace
- CMM is based on fear:
  - Don’t let what happened on last project happen on this one!
  - Need reviews, approvals, committees, forms to avoid problems
- XP designed by programmers
  - Based on Smalltalk development systems
    - Programming env. developed at Xerox Parc
      - Apple stole interface from Xerox for Lisa (before Mac)
      - Windows stole interface from Apple. Apple sued & lost
  - Addresses programmer needs

How to decide what’s better?

- Fact: Hawthorne Effect (Western Elec. plant in Chicago, 1930’s)
  - Beginning of field of industrial engineering
  - Goal: improve worker productivity
    - Increase light levels: prod. up
    - Give rest breaks: prod. up
    - Decrease light levels: prod. up
    - Decrease again: prod. up
    - Put light levels back to original: prod. up
- What’s going on?
  - Expectations effect results?
  - Excitement of participating in a study?
  - Knowing people are watching?
  - Makes medical experimentation more difficult!

Perceived problem: change expensive, get it right the first time

- Do exhaustive analysis; build system so that all foreseeable changes made with configuration changes
  - Smalltalk problem: programmers tended to build a wonderful environment for developing a product rather than developing a product.
- Do analysis; build system so that likely changes can be made more easily
- Write components so that dependencies are minimized; easy to change parts as necessary
- Focus on getting current version shipped; changes, if needed, will come from another budget
XP influenced by programmer worries:

- Schedule slippages
- Cancelled project
- System goes sour
- Defect rate
- Problem misunderstood
- World changes
- Feature-rich software
- Staff turnover
- If you've been part of a failed project, damages your career for a long time

XP “solutions” - 1

- Schedule slippages
  - Deliver new version every few weeks
- Cancelled project
  - Get product in hands of users
- System goes sour
  - Tight delivery schedule
  - Tight coupling with customer on site
  - Feedback from users

XP “solutions” - 2

- Defect rate
  - Extreme unit testing
- Problem misunderstood
  - Customer co-located with development team
- World changes
  - Customer co-located with development team
**XP “solutions” - 3**
- Feature rich software
  (Fun for inexperienced programmers; feared by experienced programmers)
- Customer selects features based on need
- Staff turnover
  (More concern about other people leaving)
- People stick with exciting successful projects
  - They’re challenging and fun

**XP life cycle - 1**
- **Exploration** - short period. Team experiments with technology to gain confidence in estimating what’s needed to satisfy customer desires.
- **Planning** - very short; team creates initial release plan for the date at which the smallest, most valuable capabilities will be done.

**XP life cycle - 2**
- **Iteration to First Release** - team works in short iterations to delivery tested functionality. Every 3 or 4 releases, release plan (step 2) is updated to reflect team performance and changed requirements
- **Productizing** - End game of initial iteration, leads to 1st release of production version
XP life cycle - 3

- **Maintenance** – normal state of an XP product. Regular iterations resulting in new and changed features for production use
- **Death of project** – customer cannot think of any more features (or unwilling to pay for more). Team writes documentation needed for future enhancements then is disbanded

What’s XP missing?

- No efficiency gains through specialization
  - Part of the fun of XP is that every team member designs, codes, tests
- No detailed project plans
  - How do we know when we’re 50% done?
- No comprehensive documentation to ensure auditability and traceability
- (Almost) no second set of eyes checking people’s work
  - Though XP uses “Pair Programming:” people work in pairs

Other development methodologies

- Game development
  - Driven by predictable delivery of a stable product
  - Why? Marketing budgets
  - See http://www.gamasutra.com
- Open source (Linux primary example)
  - No shortage of developers
  - People develop many competing, duplicate items
  - Management committee then selects the best
Is XP the solution?

- Sometimes. Programmers really like it.
- What if you need 200 people?
- Better for some applications?
  - What about software to fly new Airbus or Boeing aircraft?
  - Requirements relatively well understood
- Many organizations will not put customer on site with developers; too expensive
- More?