CISC/CMPE 327 Software Quality Assurance

Queen's University, 2019-fall

Lecture #6
Agile development – XP cont'd

eXtreme Programming

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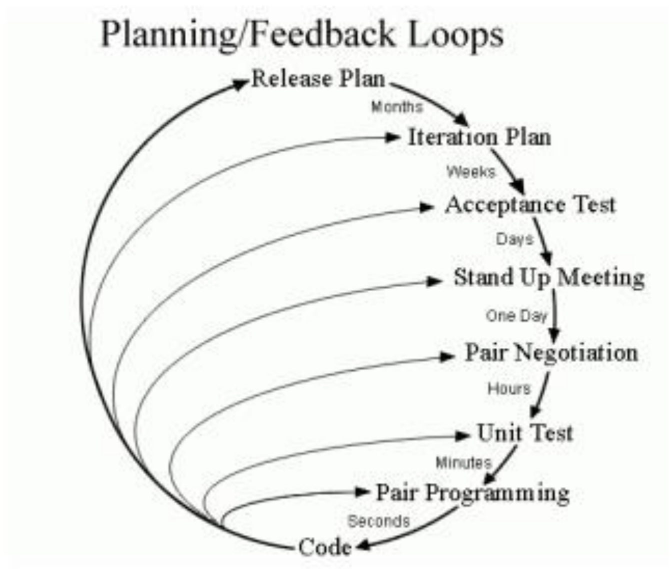
EXTREME PROGRAMMING

Expectation

Reality



XP in Practice

- Outline
  - Here we look at the actual practices of the XP process, and how they can be applied in the context of our project
  - The key ideas to keep in mind at all times are:
    - metaphor
    - simplicity
    - testing
    - automation
    - collective work
    - standards

Agile Development

Individuals and interactions over processes and tools
Working software over comprehensive documentation
Customer collaboration over contract negotiation
Responding to change over following a plan

Although there is value in the items on the right, agile software developers value the items on the left more.

http://agilemanifesto.org

XP 1: The Planning Game

- Refers to the practice of having a continuous dialog between business and technical people on the project
  - Often in the form of weekly meetings, where business people bring business constraints, and technical people bring technical constraints
    - Business people bring issues of scope, priority, releases
    - Technical people being estimates, consequences, scheduling
  - Forces the project members to continually balance what is possible (the technical aspects) with what is desirable (the business aspects)
    - Unfortunately we won't really be able to practice this in the project, the closest we come is our dialog in class and email

XP 2: Small Releases

- Refers to the practice of addressing only the most pressing business requirements, and getting them addressed by releasing a new version quickly
  - Means that we should bring the first version into production as quickly a possible
  - Means that we should shrink the cycle to the next version as much as possible
  - In practice this means shrinking software cycles to a month or two instead of six months or a year
    - In our project, we will shrink to quick releases at roughly two week intervals

XP 3: Metaphor

- Refers to the practice of understanding and speaking of the system in real-world terms independent of its programmed solution
  - An example of a metaphor is the "desktop" of modern operating systems
    - The goals in building such an operating system can be understood in terms of an office desk
  - The metaphor drives the design of the architecture and interfaces of the system
    - In our project, the metaphor is "native", that is, there is a natural physical understanding of what we are doing, our front end is simply a retail console

XP 4: Simplicity

- Refers to the practice of always using the simplest possible design and code that can handle the tests
  - Do not speculate or try to guess what will be needed in the future, address only the current test suite
  - Do not implement any features that do not affect the test results
    - In our project, the simplest, smallest solution will be considered the best

XP 5: Testing

- The only required program features are those for which there is an automated test
  - Always create tests first, and treat them as the goal (specification)
  - Programmers create unit tests (tests for each method or segment of code)
  - Customers create functional (acceptance) tests that check that the product has the required functionality
    - In our project, we will create explicit tests first as we go along, beginning with assmt. #1, and program to meet them

XP 6: Refactoring

- Refers to the practice of continually looking for ways to simplify the architecture and coding of the system as new features and changes are made
  - When a new feature or change is needed, we first look to see if there is a way to rearchitect the system to make it easier or simpler to add - if so, we rearchitect first
  - Once the new feature has been added or changed, we look to see if the resulting new program can be simplified by rearchitecting or merging similar code
    - In our project, we will face changes that may require refactoring

XP 7: Pair Programming

- Refers to the practice of having all production code written with two people working together on one terminal
  - One partner works tactically on the specific part of the code (e.g. method) being coded at the moment
  - The other partner works strategically, considering higher level issues such as:
    - is this approach going to work?
    - can we simplify this by restructuring?
    - what other tests do we need to address here?
  - In our project, we will do all programming in pairs

XP 8: Collective Ownership

- Refers to the practice of having everyone responsible for the quality of the software, and no one to blame for failures of the software
  - Everyone is responsible for identifying opportunities to improve things and to act upon them at any time
  - No one owns the code, it belongs to everyone together - there is no notion of "my code", only the universal notion of "our code"
    - In our project, all team members will be collectively responsible for all parts of all phases

XP 9: Continuous Integration

- In XP, new code is always integrated and tested within a day
  - Changes are not allowed to go on without being continually tested in context to catch integration failures before they happen
    - In our project, starting with assignment #2, we will model this by testing again immediately after each day's changes

XP 10: On-site Customer

- A real customer must be a part of the development team at all times
  - Must be available to answer questions, resolve disputes, set short-term priorities based on business knowledge
    - In our project, we will model this by having the customer (me) available by email
      (not quite right, but it will have to do!)

XP 11: Coding Standards

- Project-wide conventions about the coding of programs
  - Necessary since everyone is responsible for all of the code, and may have to read or change any part of it at any time
  - Usually specifies
    - Commenting standards, e.g., every method must have a comment of the form ...
    - Naming conventions, e.g., variables representing dates will always be named ending in "Date", all constant will be named with a two letter prefix indicating their business type
  - In our project, you will be required to specify your coding standards, and they will be judged according to the clarity, readability, and consistency of your code.

Summary: XP Practices

- XP Practices
  - XP uses a set of standard practices that together form an easy to apply practical system for team development of software
  - Emphasis is on collective responsibility, continuous improvement, and high quality standards
  - We will try to apply these practices in the course project

Summary

- References
  - Beck chapter 10 (1st ed.)
- Reading Assignment
  - Beck chapters 11, 12 (1st ed.)