

Lecture 30

Extreme Programming

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Today's Lecture

- Discuss aspects of the Extreme Programming Model
 - As presented in “Extreme Programming Explained: Embrace Change” by Kent Beck
 - Why “Extreme”?
 - Extreme Programming (XP) takes commonsense principles and practices to extreme levels

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The Basic Problem: Risk

- Beck argues that “risk” is the main problem of software development
 - Schedule slips
 - Project canceled
 - Business Changes
 - Staff Turnovers
- XP is a methodology that “addresses risk at all levels of the development process”

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Four “Control” Variables

- Beck defines four control variables in software development
 - Cost
 - Time
 - Quality
 - Scope
- External forces get to pick the values of any three variables; the development team picks the value of the fourth

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Four Variables, cont.

- Beck argues that the values of all four variables need to be “visible”
 - If stakeholders can see all four variables they can consciously choose which variables to control
 - If they do not like the resulting value of the fourth variable, they can choose to change the inputs or choose to control a different set of three

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“Scope” is Important

- Beck argues that “scope” is the most important of the four
 - By adjusting project scope based on the values of the other three, you increase your chance of success
- This perspective is backed by XP practices
 - Practice making estimates
 - Implement most important requirements first

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Cost Curve

- Cost of Change increases exponentially over time
 - its cheaper to fix a bug if its caught early in the life cycle
- XP is predicated on the notion that given the right set of practices, the cost curve can be flattened
- This is a BIG assumption and may make adoption of XP impossible for some organizations

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How to Flatten the Curve?

- Technology
 - Objects
 - Used correctly they provide extreme flexibility
 - Object Databases
- Practices
 - Simple Design, Automated Tests, Refactoring
- ...

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Learning to Drive

- Beck tells a story of learning to drive
 - Mom first told him “line the car up in the middle of the lane, straight toward the horizon”
 - Beck drives car off the road!
 - Mom then tells him “Driving is not about getting the car going in the right direction. Driving is about constantly paying attention, making a little correction this way, a little correction that way.”
- This is the paradigm for XP. Change is constant and must be constantly monitored and adapted to

Four “Values” underlying XP

- Communication
 - via several mediums: conversation, code, tests, metrics
- Simplicity
 - Beck says “Simplicity is not easy”
- Feedback
 - Tests as well as user feedback
- Courage
 - XP resembles a hill-climbing algorithm; you can get stuck in local optima

Basic Principles

- Rapid Feedback
- Assume Simplicity
- Incremental Change
- Embracing Change
- Quality Work

Additional Principles

- Teach Learning
- Small Initial Investment
- Play to Win
- Concrete Experiments
- Open, honest communication
- Work with People’s Instincts
- Accepted Responsibility
- Local Adaptation
- Travel Light
- Honest Measurement

XP Practices

- The Planning Game
- Small Releases
- Metaphor
- Simple Design
- Testing
- Refactoring
- Pair Programming
- Collective Ownership
- Continuous Integration
- 40-hour Week
- On-site Customer
- Coding Standards