Developing a

Computer Strategy Game

in an

Undergraduate Course

in

Software Development

Using

eXtreme Programming

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Overview

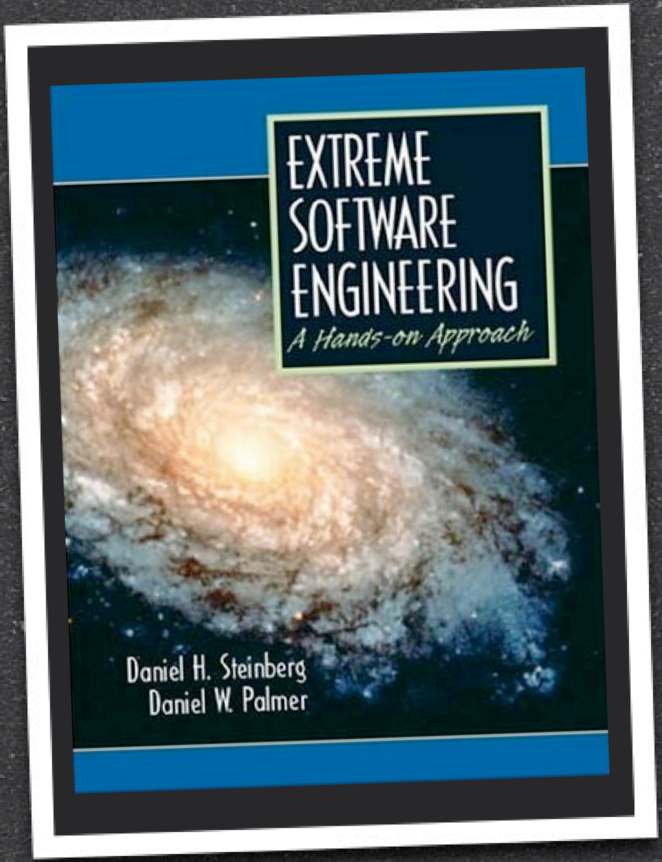
- Course Structure
- eXtreme Programming
- Spike: Pente
- Main Project: Starmada X
- Outcome

Course Structure

- Learn software development by working on a large team project
- External “customer” provides project, evaluation
- Long hours in the lab
- Student journals and independent reading

Materials and Tools

- Java
- Eclipse IDE
- JUnit testing framework
- CVS version control



Preliminary Lectures

- Introduction to Eclipse
- Overview of eXtreme Programming
- Testing first with JUnit
- Threads
- Graphics
- Networking

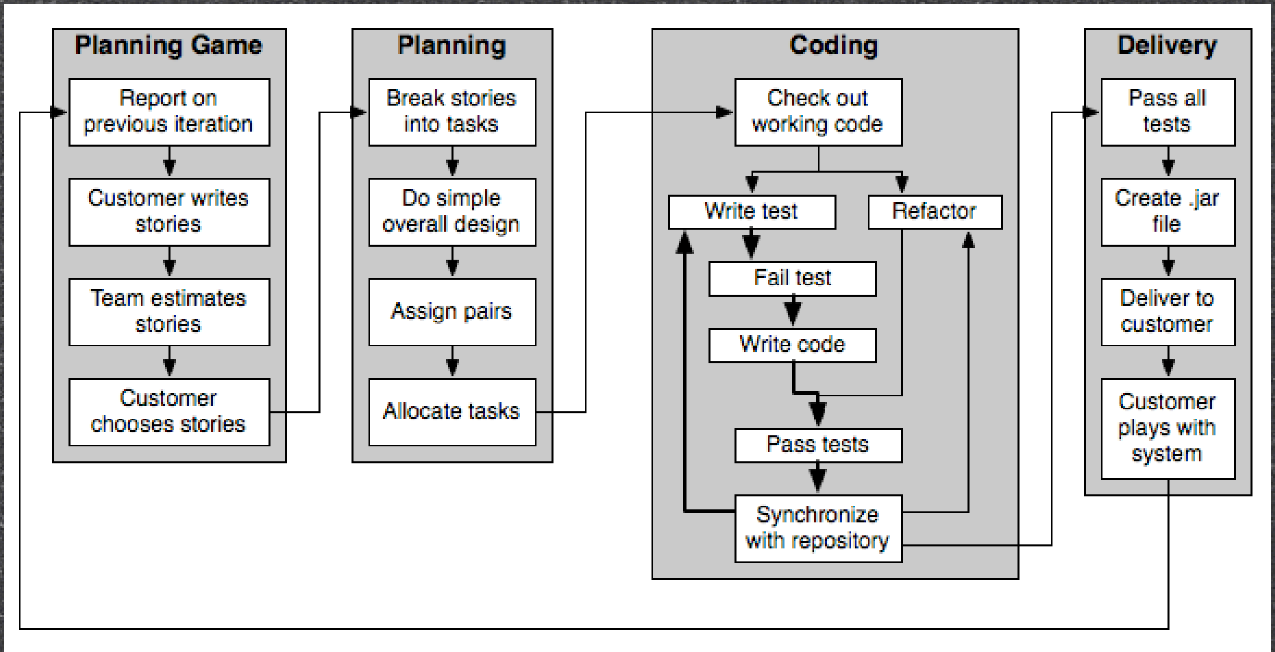
eXtreme Programming 1

- Testing First
- Pair Programming
- Sustainable Pace
- Simple Design
- Refactoring
- Small Releases

eXtreme Programming 2

- Continuous Integration
- Collective Code Ownership
- Coding Standards
- Customer Involvement
- The Planning Game

The XP Iteration



Why Use XP in a Course Like This?

- Provides rapid feedback
- Small releases mean something is up and running quickly
- Deadlines don’t slip, features do
- No “death march”

Spike: Pente

- Simple game, but involves graphics, networking, and threads
- Two weeks in three-day iterations
- Graphics and networking are very difficult to test
- Networking is tricky; use Lethbridge and Laganiere’s OCSF

Main Project: Starmada X

- Complex boardgame simulating starship combat
- Relatively few core rules, many optional rules
- Turn-based rather than real-time
- Networked game means no need for AI opponent

Outcome

- Students learned to appreciate pair programming, with some friction and balance issues
- User stories were often vague
- Time estimates were good for small stories, low for large ones
- Code eventually became muddled
- Students finally produced a playable (if very fragile) game

Lessons for Next Time

- Most of the time is spent on the GUI
- Communication is crucial
- Big Design Up Front is not a danger
- Project should be carefully simplified beforehand

Student Evaluation

- Several expressed interest in continuing work on the project
- “I believe I am a much stronger programmer today than any day previous. I’ve learned to cope with responsibility among other programmers, relay information about my progress and ask others for theirs. I think more importantly, I am much more confident about what needs to be done for a project and what questions to ask to keep that confidence.”