SOFTWARE ENGINEERING

CHAPTER-3
AN AGILE DEVELOPMENT

Software School, Fudan University
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Software Engineering: A Practitioner's Approach, 7th edition

Originated by Roger S. Pressman

Common Fears for Developers

- The project will produce the wrong product
- The project will produce a product of inferior quality
- The project will be late
- We will have to work 80 hour weeks
- We will have to break commitments
- We won't be having fun

Lack Confidence on Final Success
Mostly due to Uncertainty and Change

Manifesto for Agile Software Development

"We are uncovering better ways of developing software by doing it and helping others do it. Through this work we have come to value:

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

That is, while there is value in the items on the right, we value the items on the left more."

-- Kent Beck et al.

On February 11-13, 2001, at The Lodge at Snowbird ski resort in the Wasatch mountains of Utah, seventeen people met to talk, ski, relax, and try to find common ground and of course, to eat. What emerged was the Agile "Software Development" Manifesto. Representatives from Extreme Programming, SCRUM, DSDM, Adaptive Software Development, Crystal, Feature-Driven Development, Pragmatic Programming, and others sympathetic to the need for an alternative to documentation driven, heavyweight software development processes convened.

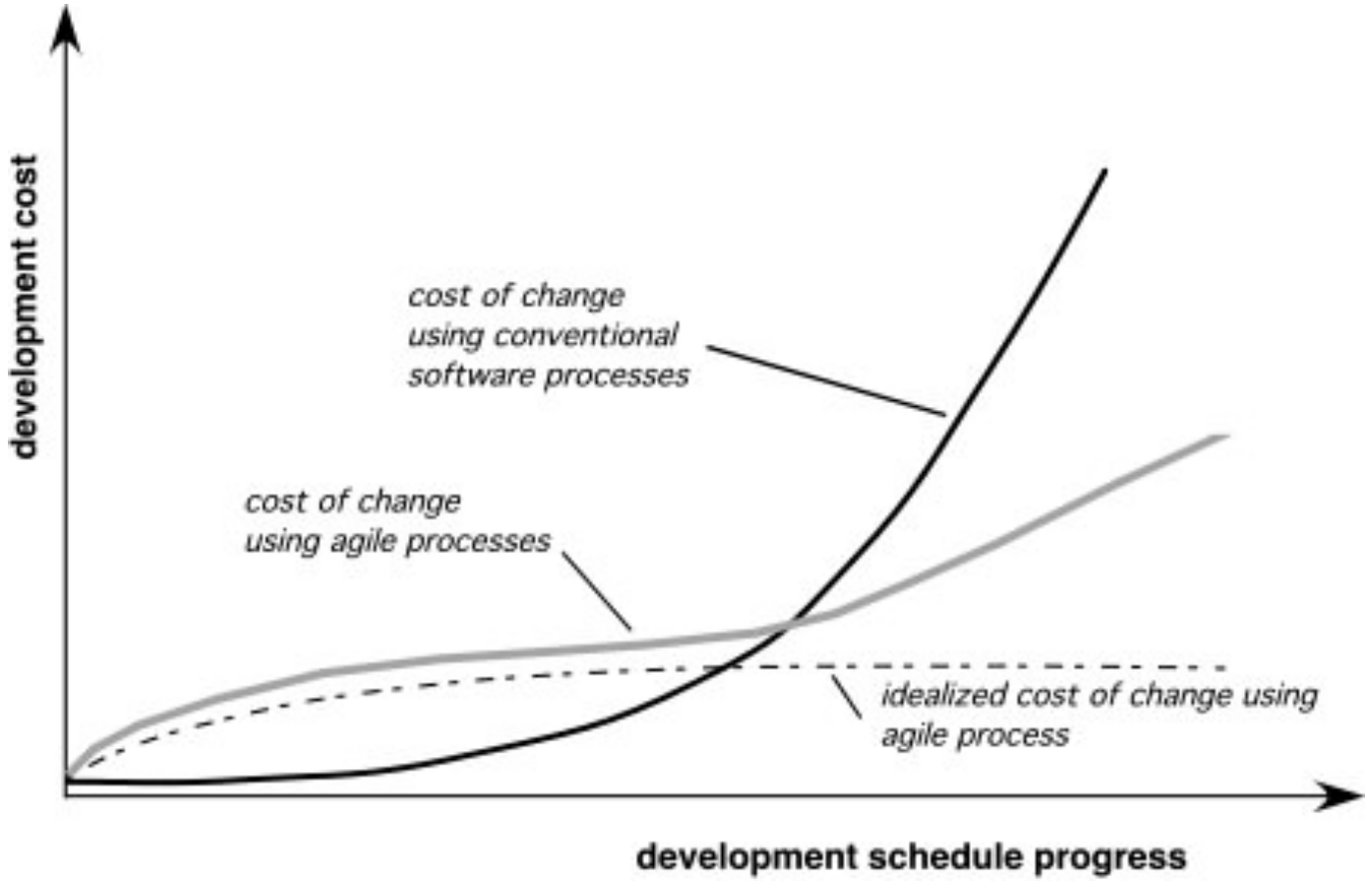
Agility is Needed

- Effective (rapid and adaptive) response to change
- Effective communication among all stakeholders
- Drawing the customer onto the team
- Organizing a team so that it is in control of the work performed

Yielding …

- Rapid, incremental delivery of software

Agility and Cost of Change

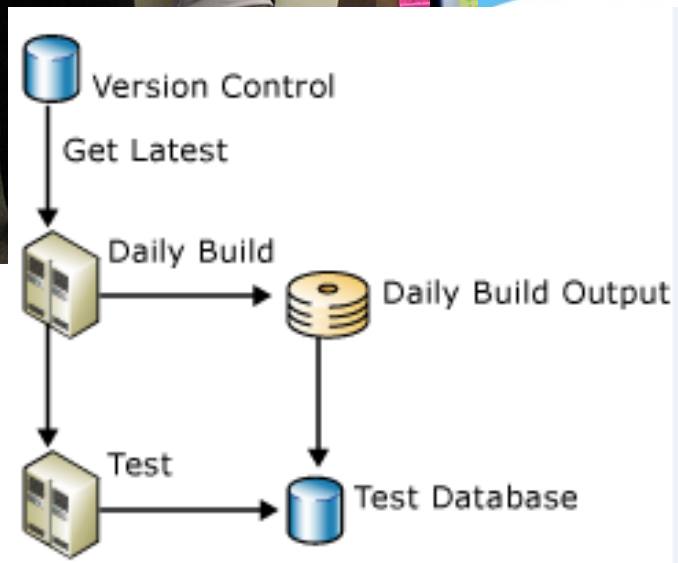


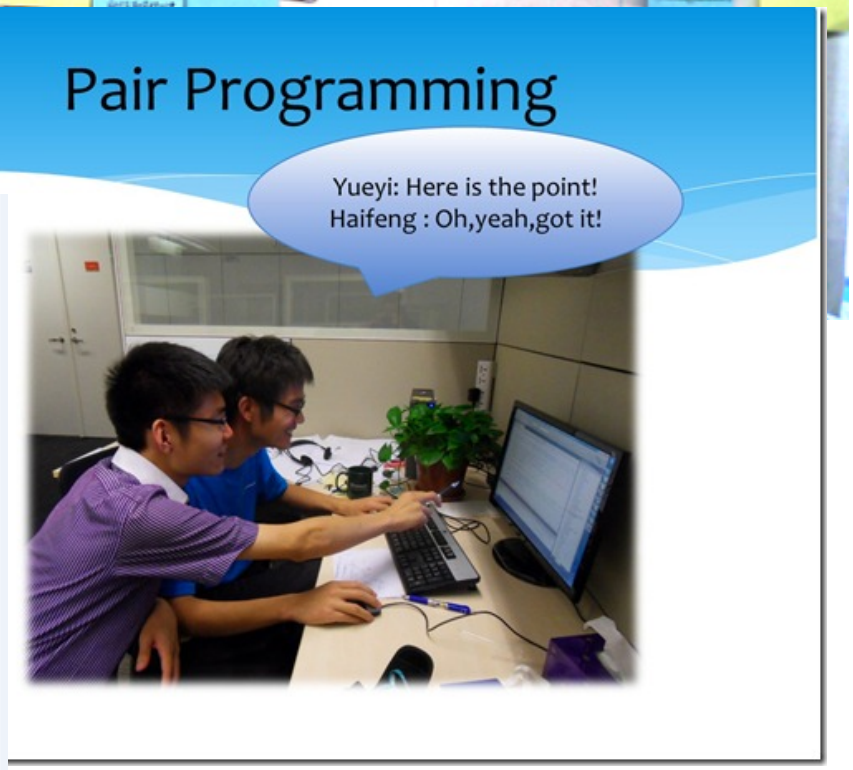
An Agile Process

- Is driven by ***customer descriptions*** of what is required (scenarios)
- Recognizes that ***plans are short-lived***
- Develops software iteratively with a heavy emphasis on ***construction activities***
- Delivers *multiple* "software ***increments***"
- ***Adapts*** as changes occur

Adaptation over Anticipation

Agile Practice





Agile Process: Assumptions

- It is difficult to predict changes in advance
- Design and construction are often interleaved
  - It is difficult to predict how much design is necessary before construction
- Analysis, design, construction and testing are not as predictable as we might like

PRINCIPLES OF AGILITY-1

- Our highest priority is to satisfy the customer through **early and continuous delivery** of valuable software
- Welcome **changing requirements**, even late in development
  - Agile processes harness change for the customer's competitive advantage
- **Deliver** working software **frequently**, from a couple of weeks to a couple of months, with a preference to the shorter time scale
- **Business people and developers** must work together daily throughout the project

PRINCIPLES OF AGILITY-2

- Build projects around **motivated individuals**
  - give them the environment and support they need
  - trust them to get the job done
- The most efficient and effective method of conveying information to and within a development team is **face-to-face conversation**
- **Working software** is the primary measure of progress
- Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a **constant pace** indefinitely

PRINCIPLES OF AGILITY-3

- **Continuous attention** to technical excellence and good design enhances agility
- **Simplicity** - the art of maximizing the amount of work not done - is essential
- The best architectures, requirements, and designs emerge from **self-organizing** teams
- **At regular intervals**, the team reflects on how to become more effective, then **tunes and adjusts** its behavior accordingly

DEBATE: CMMI VS. AGILE

"CMMI vs 敏捷"PK赛，CMMI大获全胜！_新民网

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"CMMI vs 敏捷"PK赛，CMMI大获全胜！

2009-12-02 16:35 来源：系统与软件过程改进年会 共 0 条评论 关键字：PK赛,CMMI,vs

数九隆冬隔不断奔放的热情，天寒地冻挡不住万里的宾朋。双方你来我往，各抒已见，现场气氛非常热烈，与会观众纷纷踊跃发言，并支持各自认可的团队，使得比赛更加精彩纷呈并走向了高潮。PK赛主持人-行业独立专家、CSSPIA专家委员高茂源幽默又不落俗套的主持，也是本次PK赛的亮点之一。

"CMMI vs 敏捷"PK赛的嘉宾合影

数九隆冬隔不断奔放的热情，天寒地冻挡不住万里的宾朋。2009年11月21日上午，北京京仪大酒店第一会议室，洋溢着火一般热情的气氛，CSSPI2009第八届中国系统与软件过程改进年会的重头戏之一-"CMMI VS敏捷"PK赛，正在这里激烈的进行，这也是过程改进领域两大流派首次公开碰撞。

CMMI队辩手何卫东(上海睿泰)、王小刚(QAI)、连国华(高级咨询师)、王海青（行业独立专家）与敏捷队辩手刘德意(Thomson)、雷镇(摩托罗拉)、鲍央舟（Outsofting）、李林（合络众成），均是来自企业第一线的优秀专家，拥有非常丰富的实践经验，本次辩论主要围绕"企业在实施过程中是选择敏捷还是CMMI"这一主题展开深层次、全新的探讨，双方生动又不乏理论、激烈又不乏优雅的辩论，令与会人员大开眼界，并受益匪浅。双方你来我往，各抒已见，现场气氛非常热烈，与会观众纷纷踊跃发言，并支持各自认可的团队，使得比赛更加精彩纷呈并走向了高潮。

PK赛主持人-行业独立专家、CSSPIA专家委员高茂源幽默又不落俗套的主持，也是本次PK赛的

Human Factors

- the process molds to the needs of the people and team, not the other way around
- key traits must exist among the people on an agile team and the team itself:
  - **Competence.**
  - **Common focus.**
  - **Collaboration.**
  - **Decision-making ability.**
  - **Fuzzy problem-solving ability.**
  - **Mutual trust and respect.**
  - **Self-organization.**

Extreme Programming (XP)-1

- The most widely used agile process, originally proposed by Kent Beck
- XP Planning
  - Begins with the creation of user stories
  - Agile team *assesses* each story and assigns a cost
  - Stories are *grouped* to form a deliverable increment
  - A commitment is made on the *delivery date*
  - After the first increment project velocity is used to help define *subsequent delivery dates* for other increments

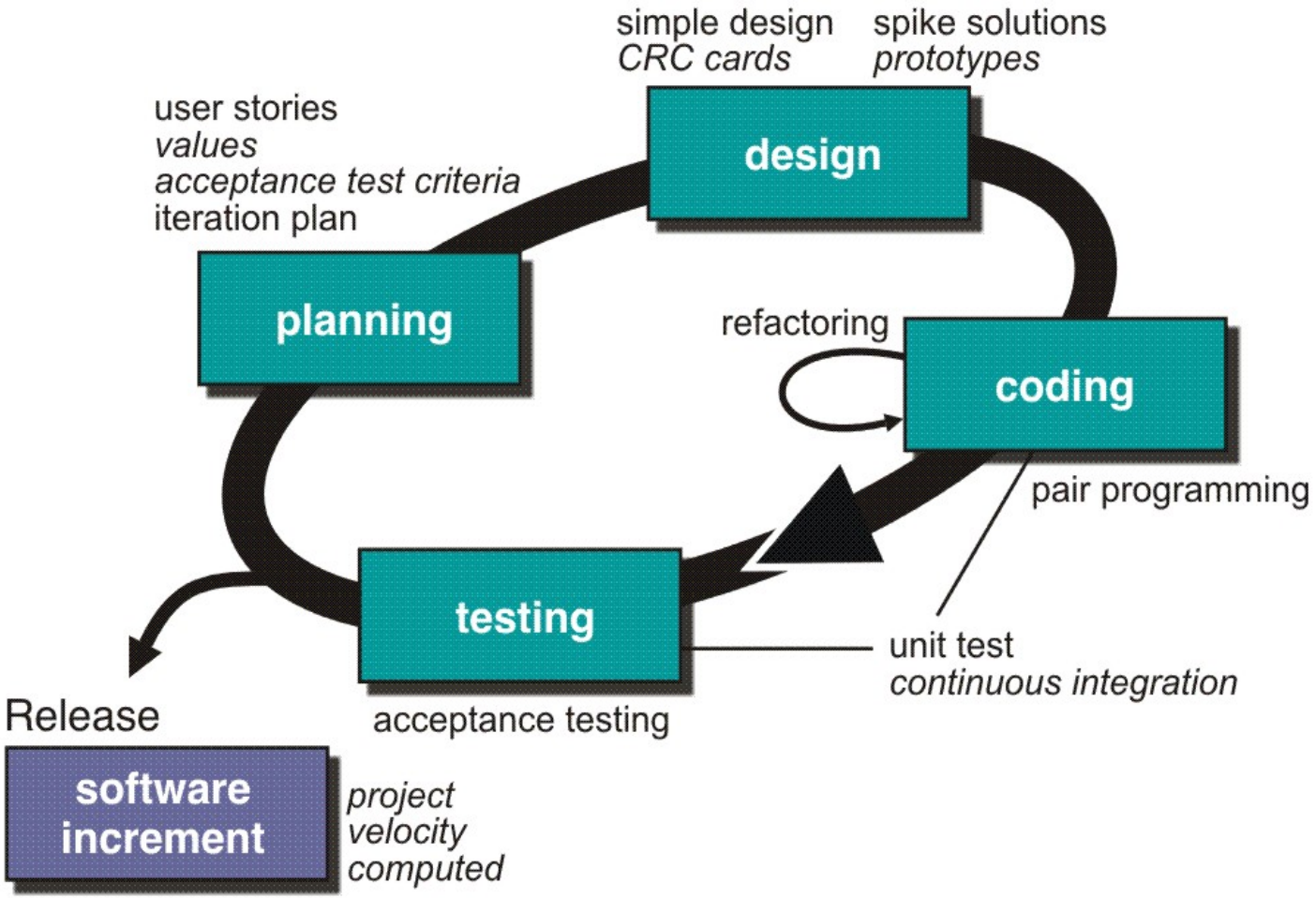
Extreme Programming (XP)-2

- XP Design
  - Follows the KIS (Keep It Simple) principle
  - Encourage the use of CRC cards (see Chapter 8)
  - For difficult design problems, suggests the creation of spike solutions — a design prototype
  - Encourages refactoring — an iterative refinement of the internal program design

Extreme Programming (XP)-3

- XP Coding
  - Recommends the construction of a unit test for a store *before* coding commences
  - Encourages pair programming
- XP Testing
  - All unit tests are executed daily
  - Acceptance tests are defined by the customer and executed to assess customer visible functionality

XP Process


simple design
CRC cards
spike solutions
prototypes
user stories
values
acceptance test criteria
iteration plan
design
planning
refactoring
coding
pair programming
testing
unit test
continuous integration
Release
acceptance testing
software increment
project velocity computed

Other Agile Processes

- Adaptive Software Development (ASD)
- Dynamic Systems Development Method (DSDM)
- Scrum
- Crystal
- Feature Driven Development (FDD)
- Agile Modeling (AM)
- ……

End of Chapter 3