

Chapter 5

■ Agile Development

Slide Set to accompany

Software Engineering: A Practitioner's Approach, 8/e

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The 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

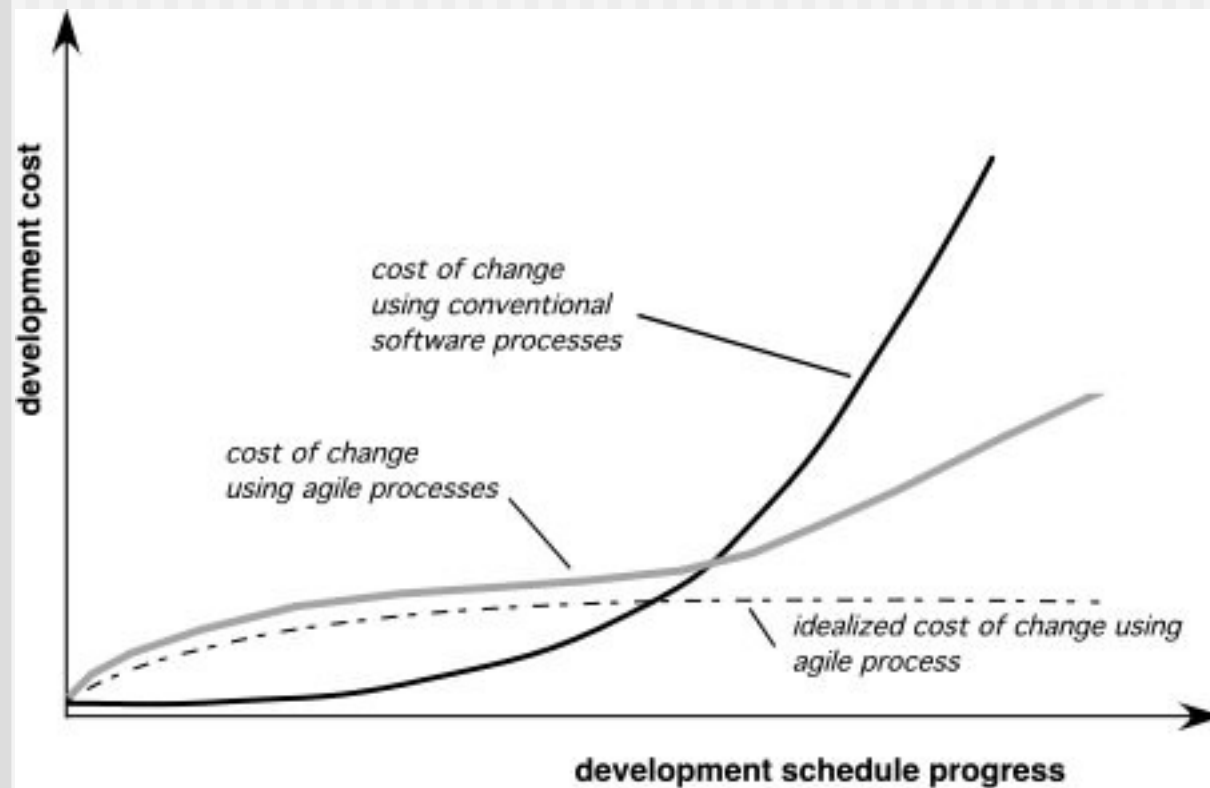
What is “Agility”?

- 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 the 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

Agility Principles - I

1. Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.
2. Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.
3. Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.
4. Business people and developers must work together daily throughout the project.
5. Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.
6. The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.

Agility Principles - II

7. Working software is the primary measure of progress.
8. Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.
9. Continuous attention to technical excellence and good design enhances agility.
10. Simplicity – the art of maximizing the amount of work not done – is essential.
11. The best architectures, requirements, and designs emerge from self-organizing teams.
12. At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.

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.**

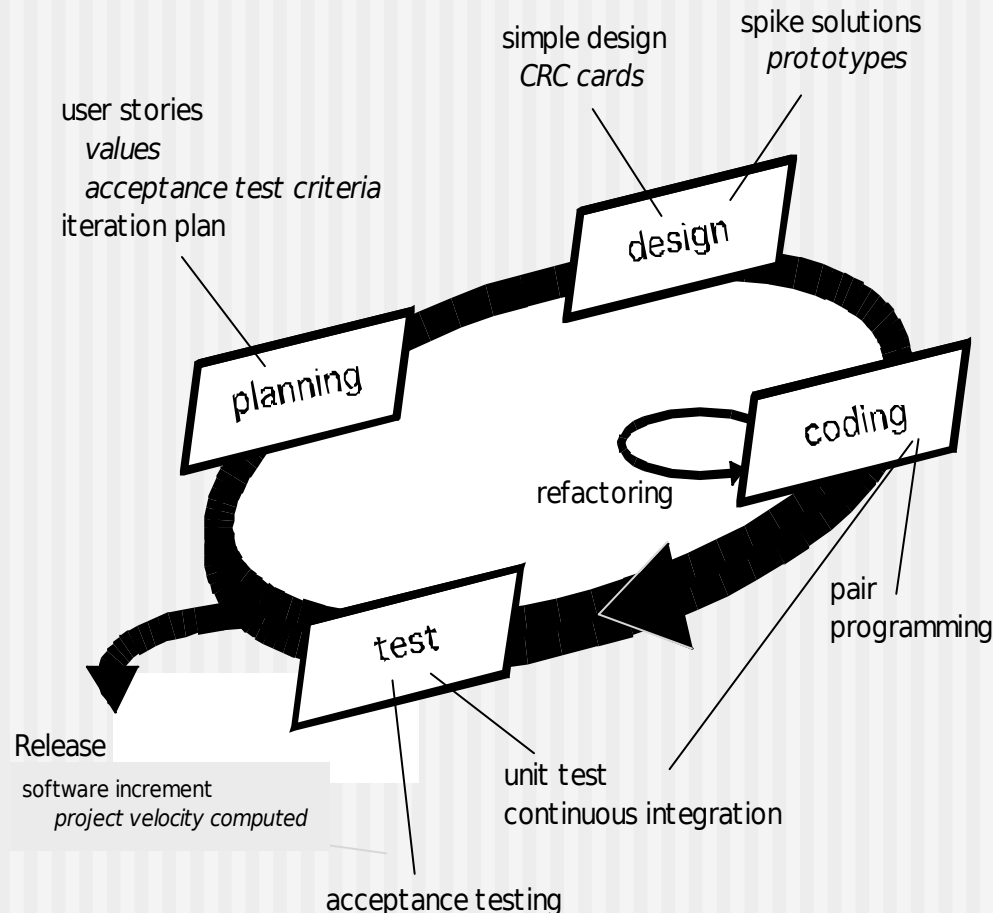
Extreme Programming (XP)

- 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 for a **deliverable increment**
 - A **commitment** is made on delivery date
 - After the first increment “**project velocity**” is used to help define subsequent delivery dates for other increments

Extreme Programming (XP)

- XP Design
 - Follows the **KIS 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
- 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

Extreme Programming (XP)



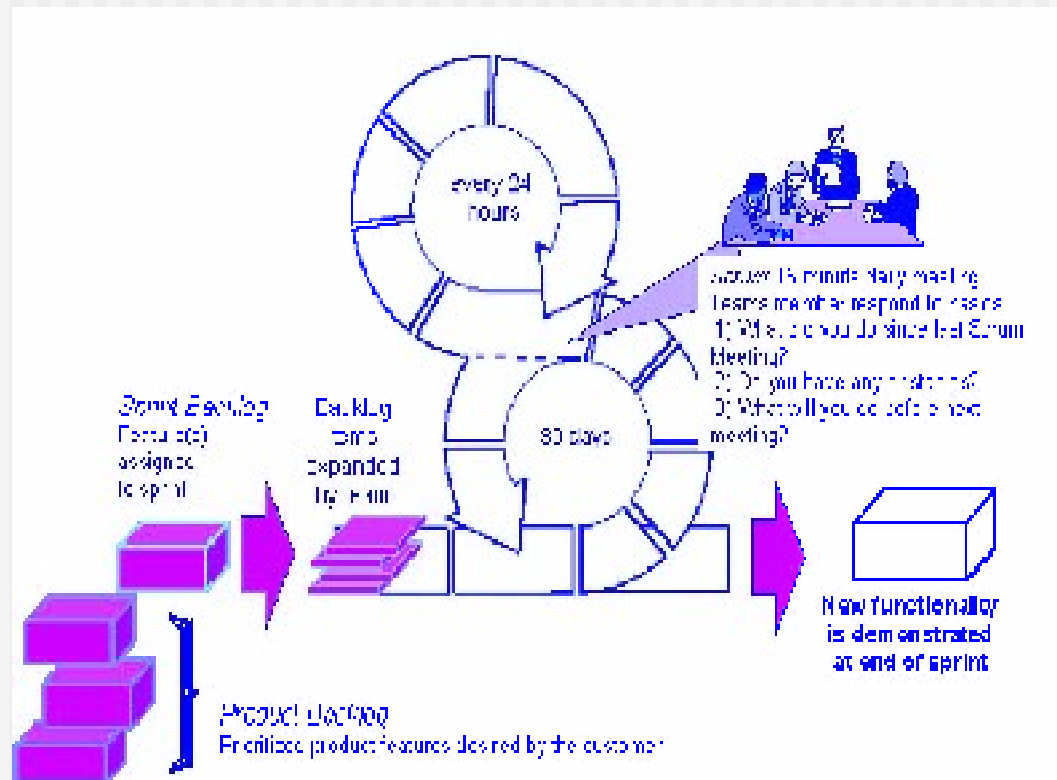
Industrial XP (IXP)

- IXP has greater inclusion of management, expanded customer roles, and upgraded technical practices
- IXP incorporates six new practices:
 - Readiness assessment
 - Project community
 - Project chartering
 - Test driven management
 - Retrospectives
 - Continuous learning

Scrum

- Originally proposed by Schwaber and Beedle
- Scrum—distinguishing features
 - Development work is partitioned into “**packets**”
 - **Testing and documentation are on-going** as the product is constructed
 - Work occurs in “**sprints**” and is derived from a “**backlog**” of existing requirements
 - **Meetings are very short** and sometimes conducted without chairs
 - “**demos**” are delivered to the customer with the time-box allocated

Scrum

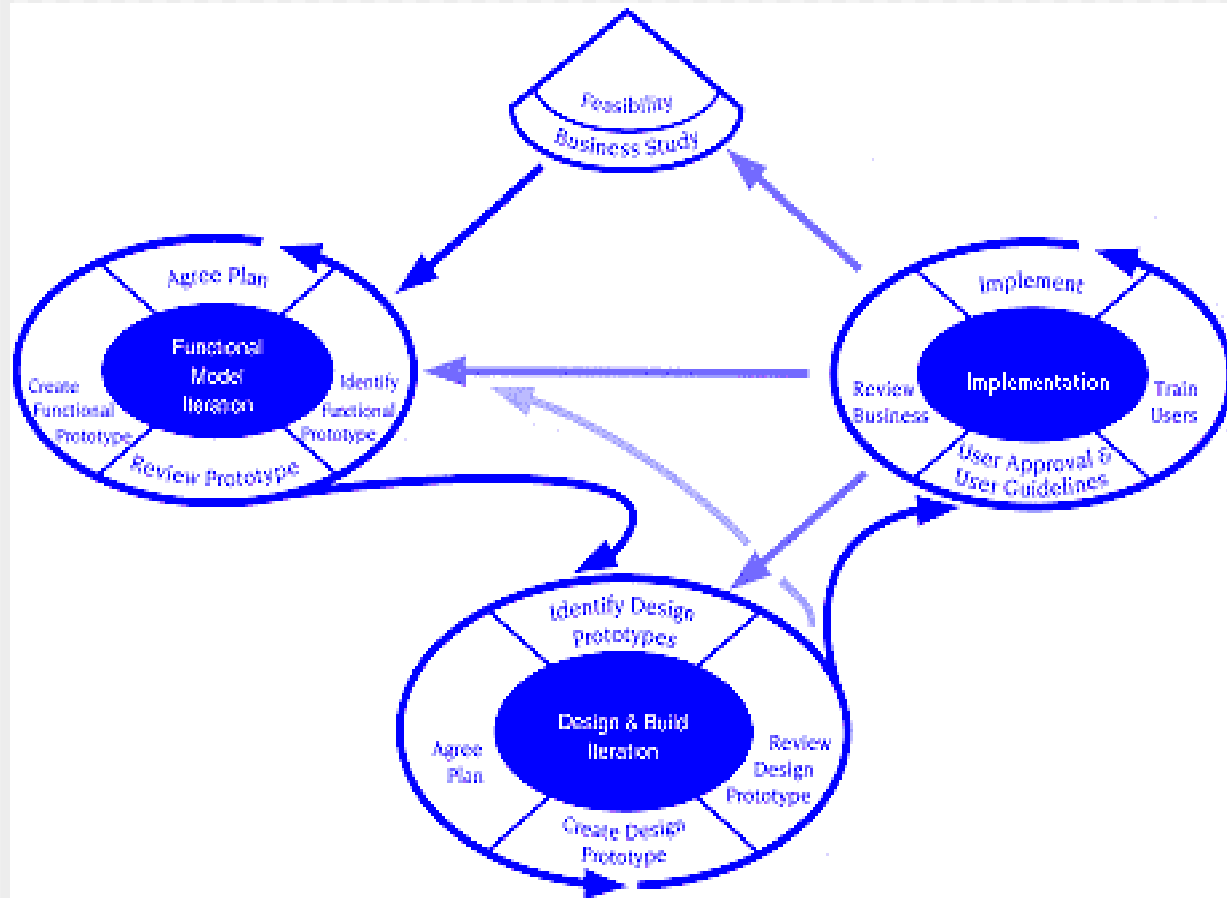


Scrum Process Flow (used with permission)

Dynamic Systems Development Method

- Promoted by the DSDM Consortium (www.dsdm.org)
- DSDM—distinguishing features
 - Similar in most respects to XP
 - Nine guiding principles
 - Active user involvement is imperative.
 - DSDM teams must be empowered to make decisions.
 - The focus is on frequent delivery of products.
 - Fitness for business purpose is the essential criterion for acceptance of deliverables.
 - Iterative and incremental development is necessary to converge on an accurate business solution.
 - All changes during development are reversible.
 - Requirements are baselined at a high level
 - Testing is integrated throughout the life-cycle.

Dynamic Systems Development Method



DSDM Life Cycle (with permission of the DSDM consortium)

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Agile Modeling

- Originally proposed by Scott Ambler
- Suggests a set of agile modeling principles
 - Model with a purpose
 - Use multiple models
 - Travel light
 - Content is more important than representation
 - Know the models and the tools you use to create them
 - Adapt locally

Agile Unified Process

- Each AUP iteration addresses these activities:
 - Modeling
 - Implementation
 - Testing
 - Deployment
 - Configuration and project management
 - Environment management