Chapter 3
Agile Development

Roger Pressman 7th Edition

Agile Software Development

- Agile SDLC model is a combination of iterative and incremental process models with focus on process adaptability and customer satisfaction by rapid delivery of working software product. Agile Methods break the product into small incremental builds. These builds are provided in iterations. Each iteration typically lasts from about one to three weeks. Every iteration involves cross functional teams working simultaneously on various areas like −

❖Planning

❖Requirements Analysis

❖Design

❖Coding

❖Unit Testing and

❖Acceptance Testing.

- At the end of the iteration, a working product is displayed to the customer and important stakeholders.

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.
- The most popular Agile methods include Rational Unified Process (1994), Scrum (1995), Crystal Clear, Extreme Programming (1996), Adaptive Software Development, Feature Driven Development, and Dynamic Systems Development Method (DSDM) (1995).

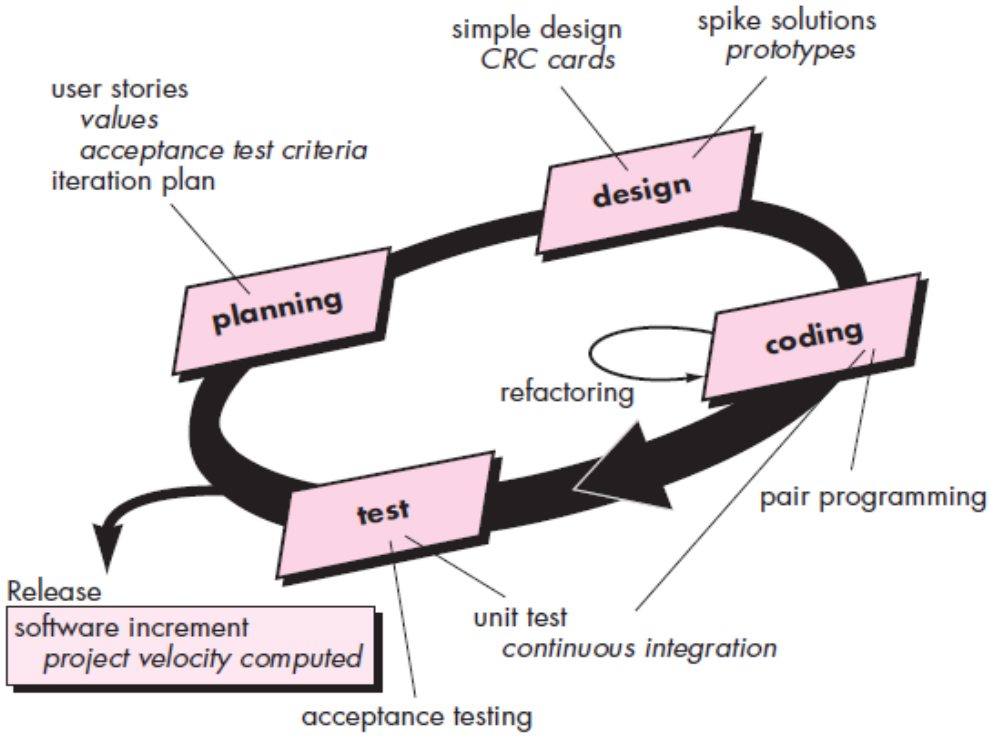
Extreme Programming (XP)

- 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
  - 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)



Other agile process models

- Adaptive Software Development (ASD)
- Scrum
- Dynamic System Development Method (DSDM)

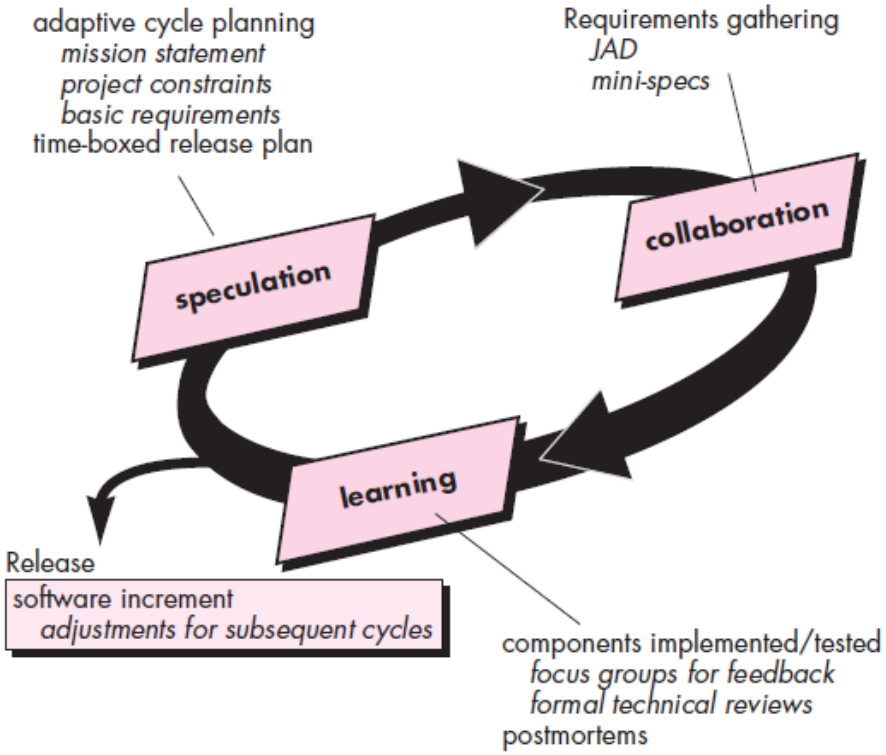
Adaptive Software Development

- Adaptive software development replaces the traditional waterfall cycle with a repeating series of *speculate*, *collaborate*, and *learn* cycles. This dynamic cycle provides for continuous learning and adaptation to the emergent state of the project. The characteristics of an ASD life cycle are that it is mission focused, feature based, iterative, timeboxed, risk driven, and change tolerant.
- The word *speculate* refers to the paradox of planning – it is more likely to assume that all stakeholders are comparably wrong for certain aspects of the project's mission, while trying to define it. During speculation, the project is initiated and adaptive cycle planning is conducted.

Adaptive Software Development

- *Collaboration* refers to the efforts for balancing the work based on predictable parts of the environment (planning and guiding them) and adapting to the uncertain surrounding mix of changes caused by various factors, such as technology, requirements, stakeholders, software vendors.
- The *learning* cycles, challenging all stakeholders, are based on the short iterations with design, build and testing. During these iterations the knowledge is gathered by making small mistakes based on false assumptions and correcting those mistakes, thus leading to greater experience and eventually mastery in the problem domain.

Adaptive Software Development



Dynamic Systems Development Method

The Dynamic Systems Development Method (DSDM) is an agile project delivery framework, primarily used as a software development method. It is a framework which embodies much of the current knowledge about project management. DSDM is rooted in the software development community, but the convergence of software development, process engineering and hence business development projects has changed the DSDM framework to become a general framework for complex problem solving tasks. Following are the characteristics:

- 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.

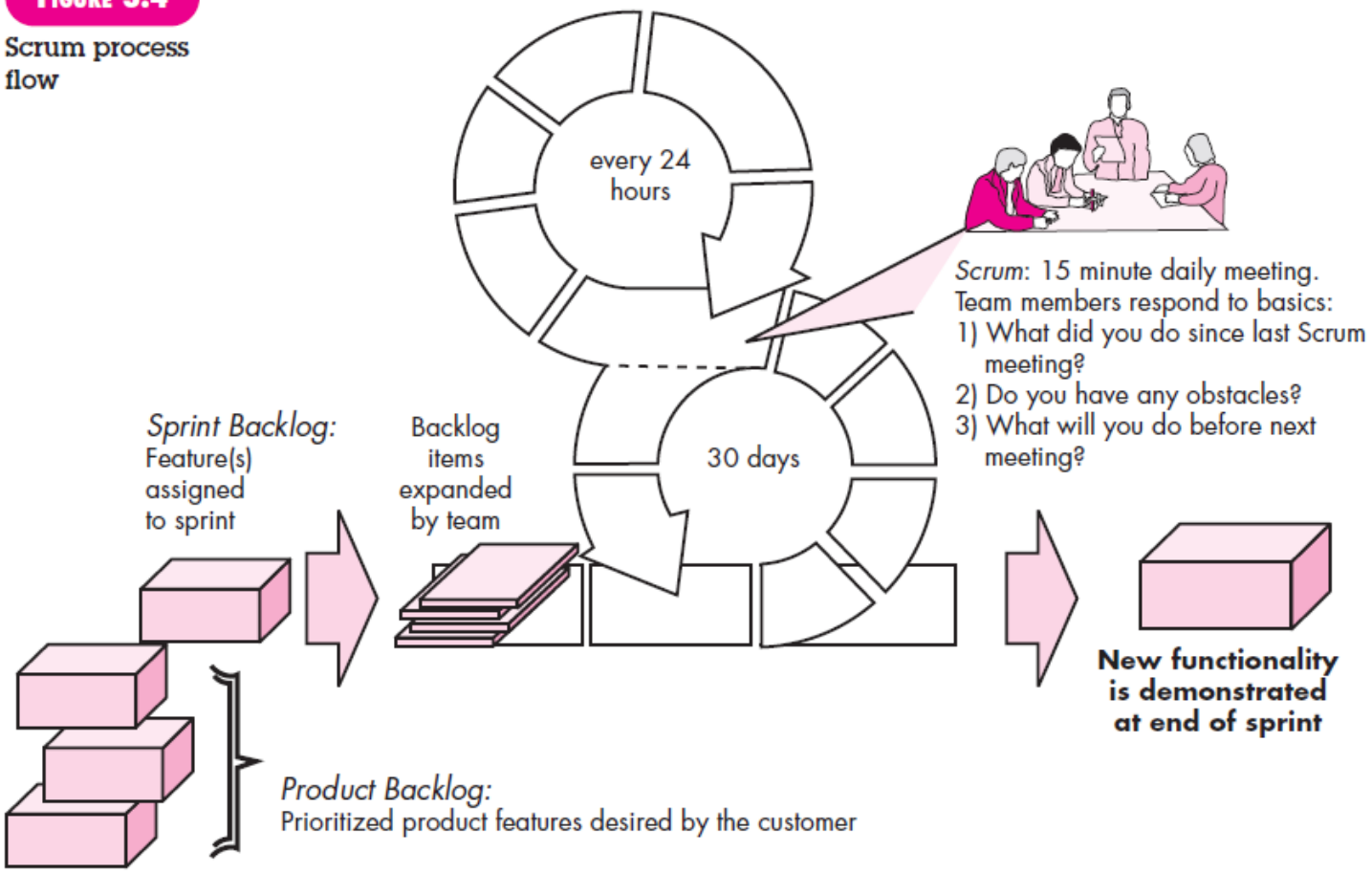
Scrum

- 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

FIGURE 3.4

Scrum process flow



Thank you!!