Chapter 2.2
The Agile Approach

Software Engineering vs Project Management

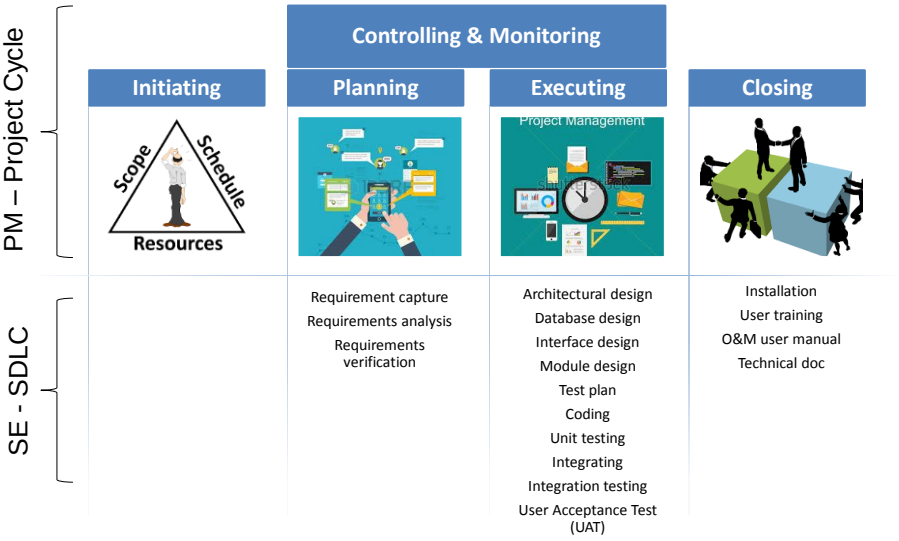
Project Management (PM)

- Work out a project through the 5 stages – **Initiating, Planning, Executing, Monitoring & Controlling, Closing**.
- Make sure the project to satisfy all related stakeholders.
- Work with different stakeholders of a project to identify and meet the project goals.
- Allocate human resource, time, budget and other resources for a project
- Handle much bigger scope - software is only a part of a project; so need to coordinate the software with other deliverables

Software Engineering (SE)

- Work out a software through the development processes – **Analysis, Designing, Coding, Integrating, Testing, Documenting, Maintaining**
- Make sure the software to satisfy the user requirements.
- Work with different users of the software to identify and meet the requirements
- Work under the constraints of the pre-determined man power, time, budget and other resources.
- Provide the project management with technical details, such as time and resource requirements for the development

SDLC in Project Management



•3

Systems Development Life Cycles

- The **Systems Development Life Cycle (SDLC)** is a framework for describing the phases involved in developing and maintaining information systems
- Systems development projects can follow:
  - **Predictive life cycle**: The scope of the project can be clearly articulated and the schedule and cost can be predicted
  - **Incremental & Iterative**: Provides for progressive development of operational software after a scope of the project is roughly defined.
  - **Adaptive Software Development (ASD) life cycle**: Requirements cannot be clearly expressed, projects are mission driven and component based, using time-based cycles to meet target dates

•4

Systems Development Life Cycles and their Approaches

More effective in situations in which requirements are very clear and fixed

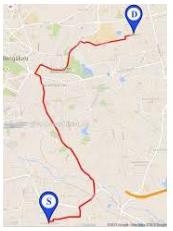
Cross the river by feeling the stones to find the way

Predictive | **Incremental & Iterative** → evolves to → **Adaptive**

Waterfall

Spiral
Prototyping
Rapid Application Development (RAD)

Agile



Obtain early feedbacks and more willing to change in unclear situations

Better in situations in which requirements tend to be changed and unclear in the beginning

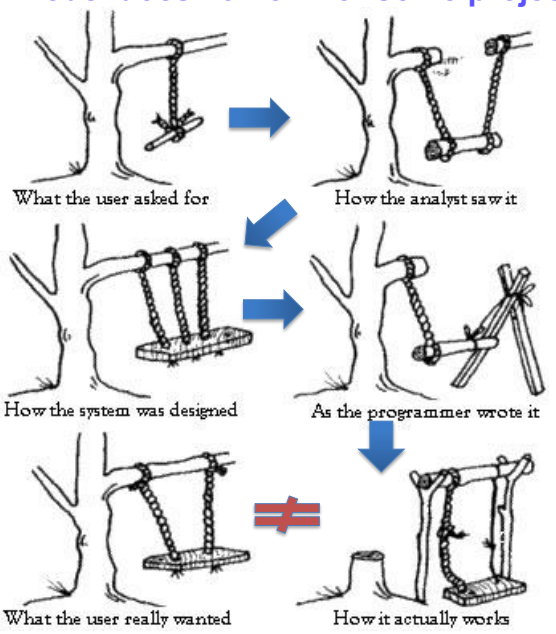
•5

Software Development Life Cycle Models

- **Predictive**
  - **Waterfall model**: has well-defined, linear stages of systems development and support
- **Incremental & Iterative**
  - **Spiral model**: shows that software is developed using an iterative or spiral approach rather than a linear approach
  - **Prototyping model**: used for developing prototypes to clarify user requirements
  - **Rapid Application Development (RAD) model**: used to produce systems quickly without sacrificing quality
- **Adaptive**
  - **Agile**: …

•6

Why Waterfall Model doesn't work for some projects?



Agile Approach

» Agile

> Is NOT a software development methodology

> Is NOT a development framework or process

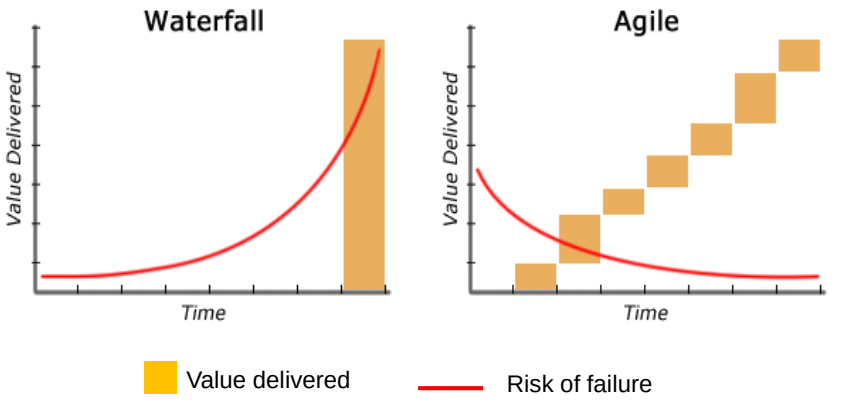
> Is essentially a set of **Values** and **Principles** as guideline which help developers to practice and make decisions in software development.

Agile Manifesto - Agile's Values

✓	X
• Individual + Interaction	• Process + Tools
• Working software	• Comprehensive doc
• Customer collaboration	• Contract + Negotiation
• Responding to change	• Following a plan

•9

Value Delivery and **Risk of failure** between **Waterfall** and **Agile**



•10

Agile's 12 Principles

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 advantages.
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.

Agile's 12 Principles (cont.)

5. Build projects around motivated individuals. Give them the environment and support their 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.
7. Working software is a primary measure of progress.
8. Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.

Agile's 12 Principles (cont.)

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 architecture, 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.

Not Agile X

The developer realizes that he needs a database to make the feature work. Then, the first idea that comes to mind is to stop working on the feature and building out a robust database layer that will handle the needs of the features and provides the need for other development that will be needed later.

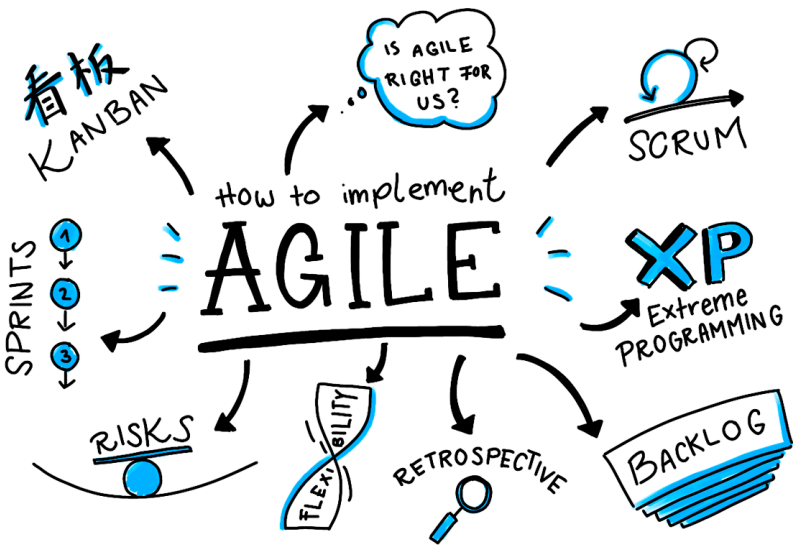
Agile ✓

If the developer follows Agile, they would think "But building up the layer means I would have to delay delivering what the customer sees as valuable software. If I can find a way to build just what is necessary to deliver this feature, it would better align with Agile principles."

Not Agile X

- We must write down all the requirements and get the biz owner and end users to agree and sign off before the work starts.
- The requirements should not be changed. Even though a minor change is raised, a strict procedure and approval are needed.
- In order to save time, we collect all necessary requirements from end users. Then, we will not meet them until UAT.
- Basically, the development team only meets once in a while after all the jobs have been clearly assigned to each of them.

•15



•17

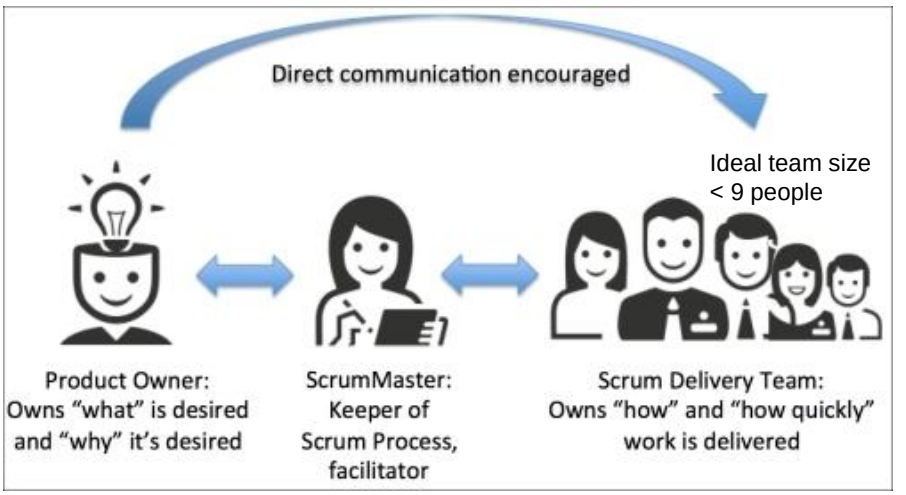
Scrum – An Agile development method

Scrum is a software development method that follows Agile's values and principles.

"Scrum" comes from the scrum formation of a rugby team because it emphasizes that team members should have a short daily meeting (15min) in each morning.

•18

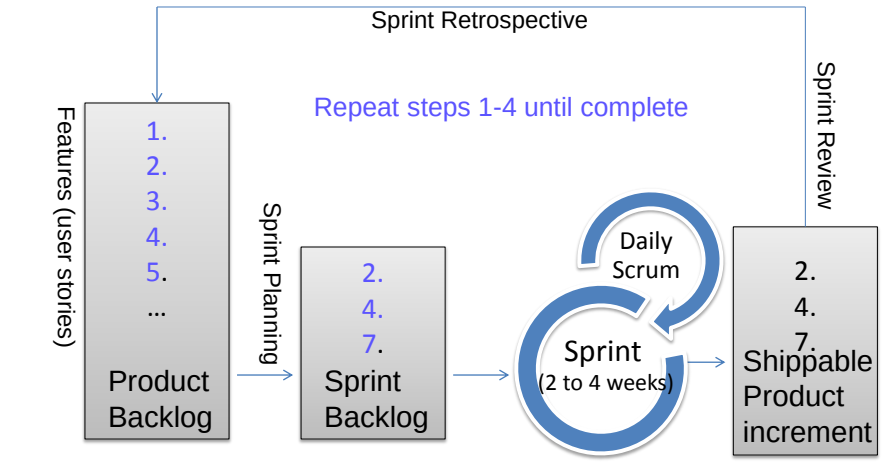
Scrum Team



Role of Scrum Master:
https://www.youtube.com/watch?v=f-rsUA2VLn8

•19

Scrum framework – An Agile development method



1. Product owner creates product wish list or backlog
2. Product team selects features to create Sprint backlog
3. Team has daily Scrum meetings in the sprint period.
4. Teams finish the features and produce shippable product

Criteria for selecting the features into the **Sprint Backlog**

- Early delivery
- Users' expectation
- Dependencies
- Known requirements

Scrum Framework

1. A **Product owner** creates a prioritized wish list called a ***product backlog***
2. During ***sprint planning***, the **team** pulls a small chunk from the top of that wish list (a ***sprint backlog***), and decides how to implement those pieces.
3. The team has a certain amount of time (a ***sprint*** or *iteration*) to complete its work, usually 2 – 4 weeks. And meet each day to know the progress and impediments (called ***daily Scrum***).
4. Along the way, the **ScrumMaster** keeps the team focused on its goal.
5. At the end of the ***sprint***, the work should be potentially shippable to users for testing or using.
6. The sprint ends with a ***sprint review*** and ***retrospective***.
7. As the next sprint begins, the team chooses another chunk of the ***product backlog*** and begins working again.

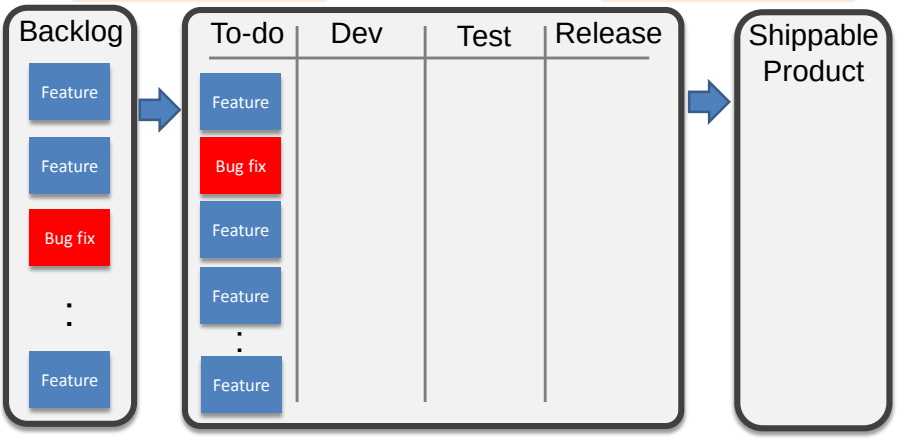
Terminologies of Scrum

- **Sprint –** a small, complete deliverable during a short duration
- **Sprint planning –** a meeting for planning a sprint, such as clearing the requirements, selecting product backlogs for the coming sprint.)
- **Sprint backlogs –** the works that are selected for the current sprint
- **Product backlogs –** the works need to be done to complete the product
- **Daily Scrum –** a short daily meeting (usually 15 min.) of the team members to identify the progress and impediments
- **Sprint review –** a meeting held at the end of the sprint to inspect the deliverables. ScrumMaster, Product Owner, Development team and End users join the meeting.
- **Retrospective –** an opportunity for the Scrum Team to inspect itself and create a plan for improvements during the next sprint.

Scrum / Agile Board (1)

Sprint planning session – select and prioritize the tasks.

By end of the sprint, all features in release column are packaged to shippable product.

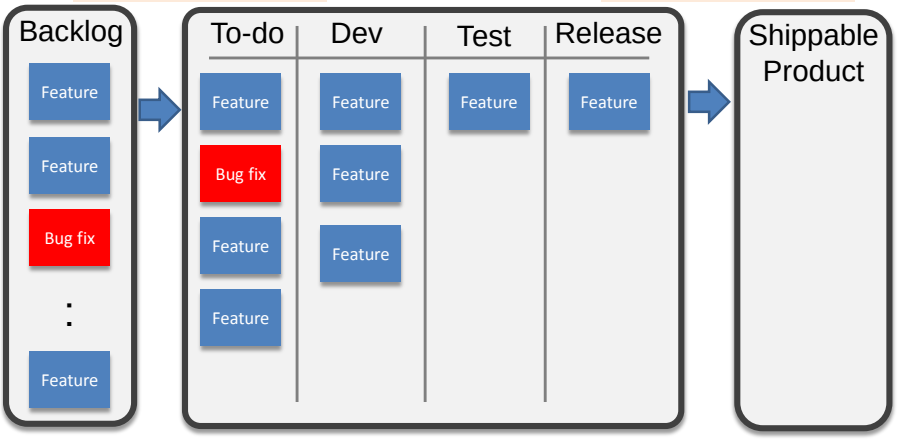


Team member names can be adhered to the tasks.

Scrum / Agile Board (2)

Sprint planning session – select and prioritize the tasks.

By end of the sprint, all features in release column are packaged to shippable product.

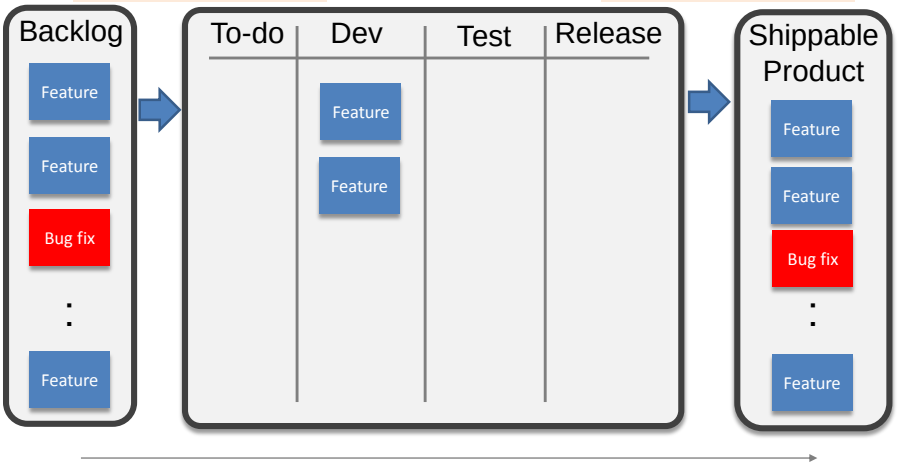


Team member names can be adhered to the tasks.

Scrum / Agile Board (3)

Sprint planning session – select and prioritize the tasks.

By end of the sprint, all features in release column are packaged to shippable product.



Team member names can be adhered to the tasks.

User Story

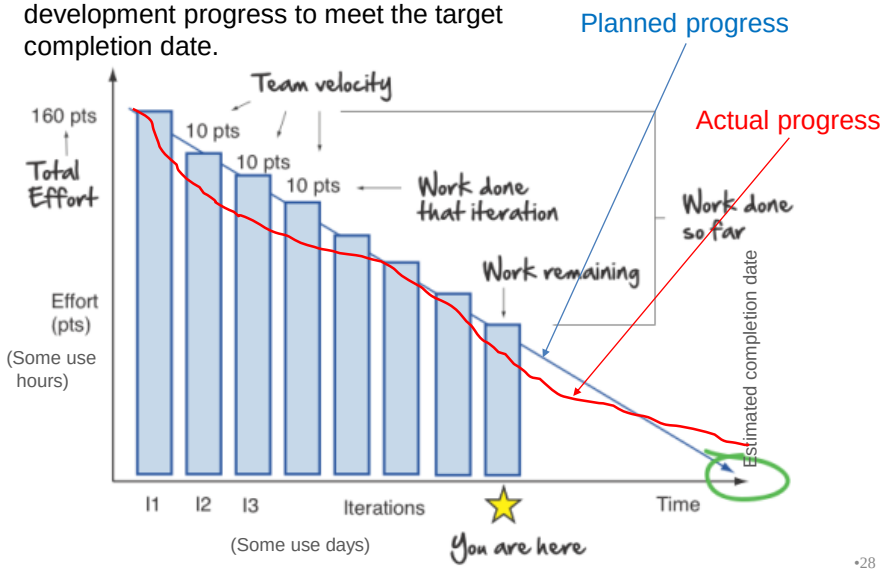
User stories are short, simple description of a feature told from the perspective of the person who desires the new capability, usually a user or customer of the system. They typically follow a simple template as:

Difficulty level

#	Backlog Item (User Story)	Story Point
1	As a Teller I want to be able to find clients by last name, so that I can find their profile faster	4
2	As a System Admin I want to be able to configure user settings so that I can control access	2
3	As a System Administrator I want to be able to add new users when required so that…	2
4	As a data entry clerk, I want the system to automatically check my spelling so that…	1

Burndown Chart

This is a scheduling tool to help manage the development progress to meet the target completion date.



•28