Agile Methodologies

Software development life cycle [Software engineering]

1. Requirement gathering
2. Requirement analysis → SRS
   - SRS → Software Requirement Specification
3. Design
   - DB schema
   - Wireframe (UI)
4. coding (Development)
5. Testing
   - black box
   - white box
   - gray box
   - unit testing
   - system testing
   - integration testing
6. Deployment (moving from dev to cloud / internet)
7. maintenance

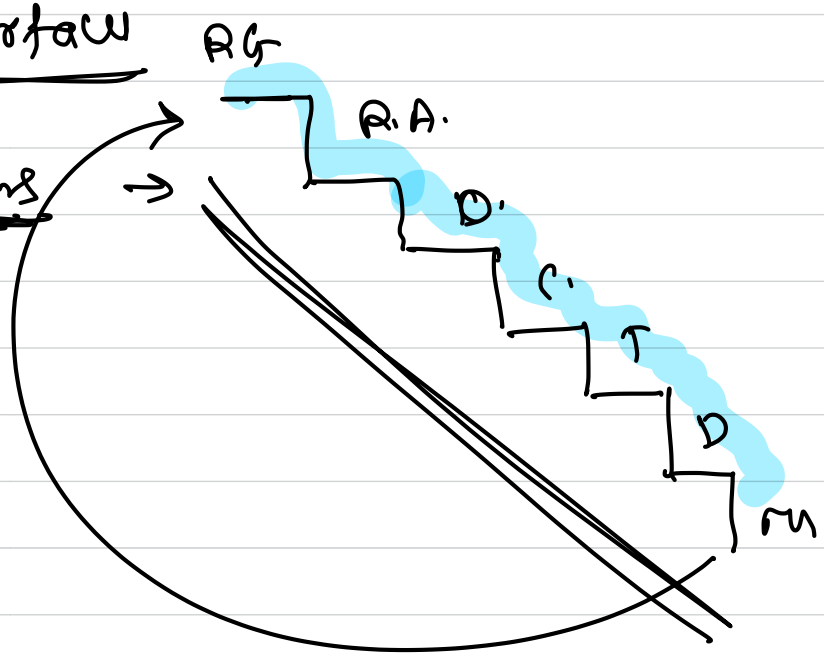
* models : waterfall, iterative, ...

* e-commerce

→ orders
→ customers
→ products
→ ⋮

waterfall

2 years →

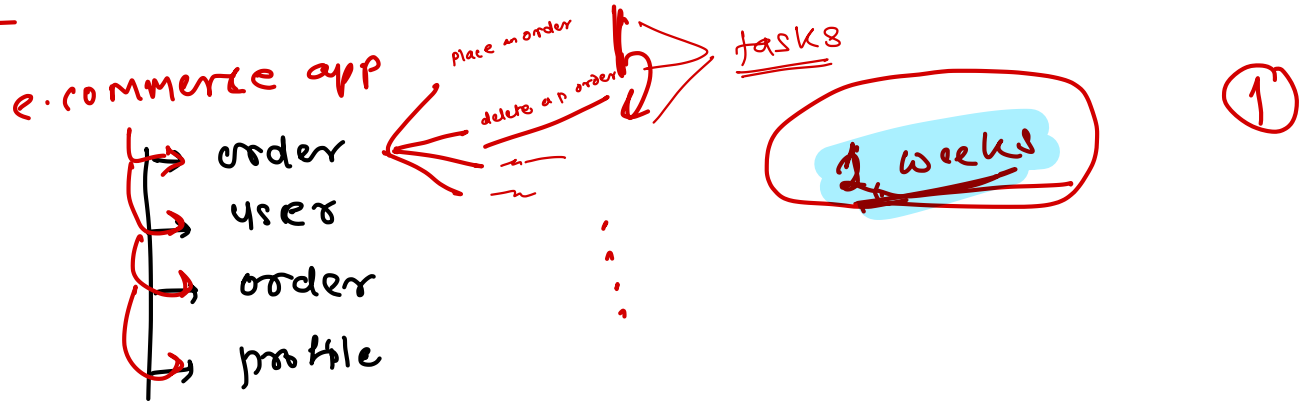


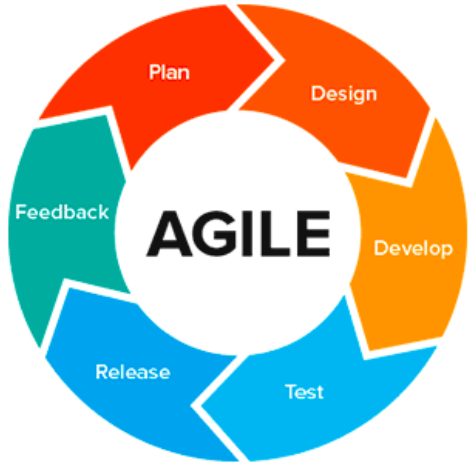
① product management

→ add product } → 1 week : → sprint
→ search product
→ edit product } → 1 week : → sprint
→ ⋮

Agile Methodologies

- Agile model believes that every project needs to be handled differently and the existing methods need to be tailored to best suit the project requirements
- The tasks are divided to time boxes (small time frames) to deliver specific features for a release
- Iterative approach is taken and working software build is delivered after each iteration
- Each build is incremental in terms of features; the final build holds all the features required by the customer





Agile Manifesto

- **Individuals and interactions**
  - self-organization and motivation are important
- **Working software**
  - Demo working software is considered the best means of communication with the customers to understand their requirements, instead of just depending on documentations
- **Customer collaboration**
  - continuous customer interaction is very important to get proper product requirements
- **Responding to change**
  - focused on quick responses to change and continuous development

Agile Methodologies

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

What is Scrum ?

- Scrum isn't a process, it's a framework that facilitates processes amongst other things
- Is an agile way to manage a project
- Management framework with far reaching abilities to control and manage the iterations and increments in all project types
- One of the implementations of agile methodology
- Incremental builds are delivered to the customer in every two to three weeks time
- Ideally used in the project where the requirement is rapidly changing
- The framework is made up of a Scrum team, individual roles, events, artefacts, and rules

Scrum Principles

- Our highest priority is to satisfy the customer through early and continuous delivery of valuable software
- Welcome changing requirements, even late in development
- Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale
- Business people and developers must work together daily throughout the project
- Build projects around motivated individuals
- The most efficient and effective method of conveying information to and within a development team is face-to-face conversation

Scrum Principles

- Working software is the primary measure of progress
- Agile processes promote sustainable development
- 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

Scrum Pillars

Transparency

All parts of the process should be transparent, open, and honest for everyone to see

Inspection

Everything that is worked on during a sprint can be inspected by the team to make sure that it is achieving what it needs to.

Adaptation

If a member of the Scrum team or a stakeholder notices that things aren't going according to plan, the team will need to change up what they're doing to fix this as quickly as possible

Scrum Values

Courage	Courage to do the right thing and work on tough problems
Focus	Focus on the sprint and its goal
Commitment	Commitment to the team and sprint goal
Respect	Respect, for each other by helping people to learn the things that you're good at, and not judging the things that others aren't good at
Openness	Be open and honest and let people know what you're struggling with challenges and problems that are stopping you from achieving success

How scrum pillars help us?

Self-organization

- This results in healthier shared ownership among the team members
- It is also an innovative and creative environment which is conducive to growth

Collaboration

- Essential principle which focuses collaborative work

Time-boxing

- Defines how time is a limiting constraint in Scrum method
- Daily Sprint planning and Review Meetings

Iterative Development

- Emphasizes how to manage changes better and build products which satisfy customer needs
- Defines the organization's responsibilities regarding iterative development

Scrum Roles

Product Owner

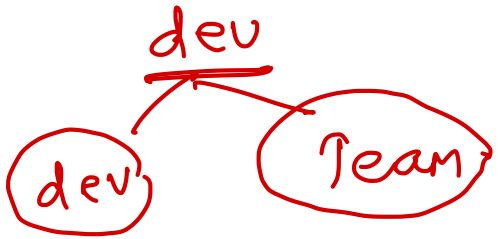
- Job to understand and engage with the stakeholders to understand what needs to be done and create that backlog
- Also need to prioritize that backlog

Scrum Master

- Helps the entire team achieve the scrum goals and work within scrum
- Support the product owner with their responsibilities in terms of managing the backlog as well as, supporting the development team

Dev Team

- The people who are creating the product or service and delivering done increments at the end of each sprint
- Includes developers, tester, writers, graphics artists and others



Scrum Artefacts

Product Backlog

Sprint Backlog

Increment

Scrum Events

Sprint Planning

- Happens at the start of every sprint
- it should probably be about between four and eight hours

Daily Scrum

- This is a very short time-boxed event
- Usually only lasting no more than 15 minutes

Sprint Review

- Collaborative events to demo what has been achieved and to help keep everyone who's involved working together

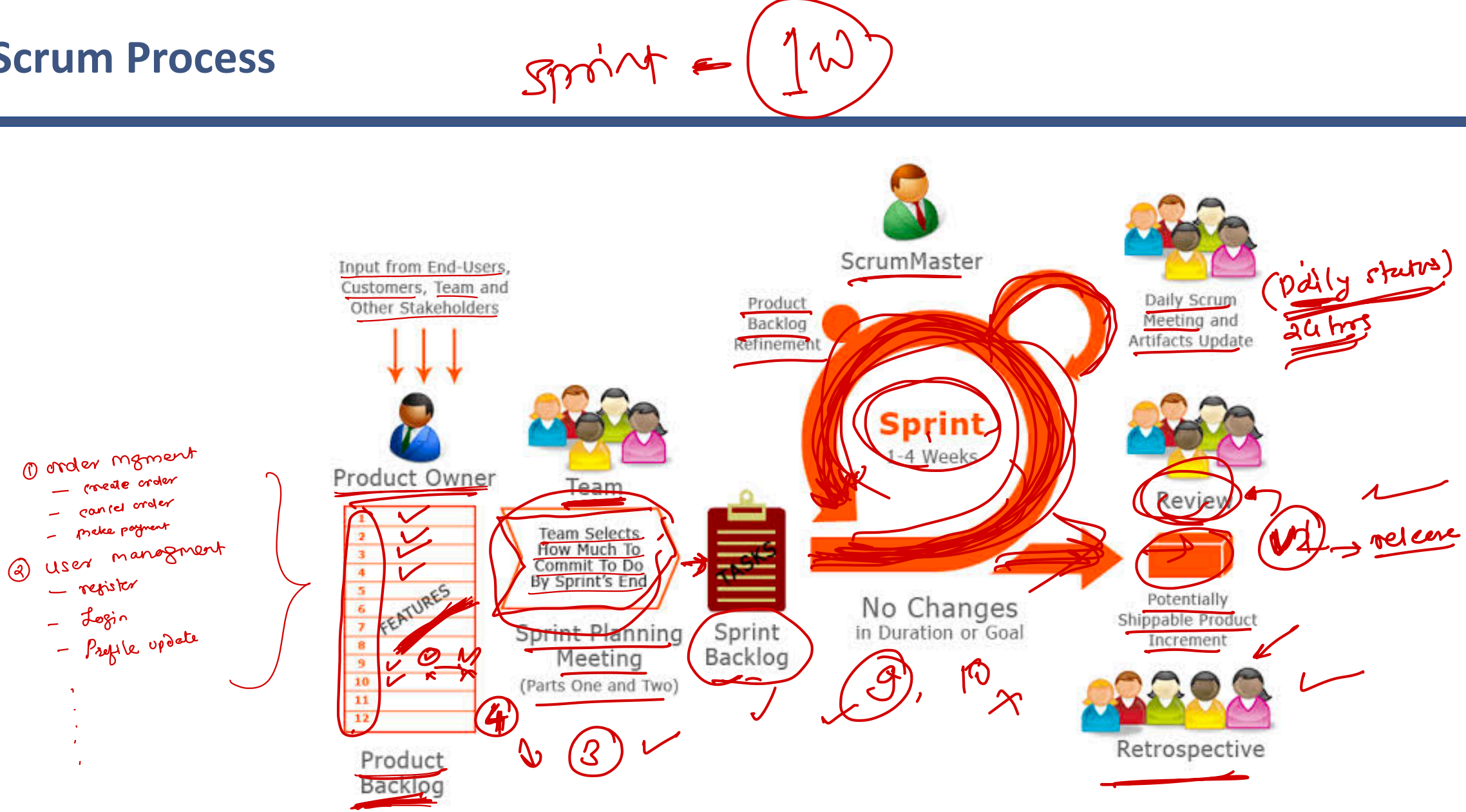
Sprint Retrospective

- About continuous process and improvement and we need to take what we've learned into the next sprint planning session

Sprint

- It is really the beating heart of scrum and all the scrum events take place in it

Scrum Process



Agile vs traditional models

No	Agile Methodologies	Traditional Methodologies
1	Incremental value and risk management	Phased approach with an attempt to know everything at the start
2	Embracing change	Change prevention
3	Deliver early, fail early	Deliver at the end, fail at the end
4	Transparency	Detailed planning, stagnant control
5	Inspect and adapt	Meta solutions, tightly controlled procedures and final answers
6	Self managed	Command and control
7	Continual learning	Learning is secondary to the pressure of delivery

Agile - Advantages

- Very realistic approach to software development
- Promotes teamwork and cross training
- Functionality can be developed rapidly and demonstrated
- Resource requirements are minimum
- Suitable for fixed or changing requirements
- Delivers early partial working solutions
- Good model for environments that change steadily
- Minimal rules, documentation easily employed
- Enables concurrent development and delivery within an overall planned context
- Little or no planning required
- Easy to manage
- Gives flexibility to developers

Agile - Disadvantages

- Not suitable for handling complex dependencies.
- More risk of sustainability, maintainability and extensibility.
- An overall plan, an agile leader and agile PM practice is a must without which it will not work.
- Strict delivery management dictates the scope, functionality to be delivered, and adjustments to meet the deadlines.
- Depends heavily on customer interaction, so if customer is not clear, team can be driven in the wrong direction.
- There is a very high individual dependency, since there is minimum documentation generated.
- Transfer of technology to new team members may be quite challenging due to lack of documentation.

Scrum tools

- Jira – https://www.atlassian.com/software/jira/
- Clarizen – https://www.clarizen.com/
- GitScrum – https://site.gitscrum.com/
- Vivify Scrum – https://www.vivifyscrum.com/
- Yodiz – https://www.yodiz.com/
- ScrumDo – https://www.scrumdo.com/
- Quickscrum – https://www.quickscrum.com/
- Manuscript – https://www.manuscript.com/
- Scrumwise – https://www.scrumwise.com/
- Axosoft – https://www.axosoft.com/

Agile Methodologies – Scrum Terminologies

- **Scrum:** a framework to support teams in complex product development
- **Scrum Board:** a physical board to visualize information for and by the Scrum Team, used to manage Sprint Backlog
- **Scrum Master:** the role within a Scrum Team accountable for guiding, coaching, teaching and assisting a Scrum Team and its environments in a proper understanding and use of Scrum
- **Scrum Team:** a self-organizing team consisting of a Product Owner, Development Team and Scrum Master
- **Self-organization:** the management principle that teams autonomously organize their work

Agile Methodologies – Scrum Terminologies

- **Sprint:** time-boxed event of 30 days, or less, that serves as a container for the other Scrum events and activities.
- **Sprint Backlog:** an overview of the development work to realize a Sprint's goal, typically a forecast of functionality and the work needed to deliver that functionality.
- **Sprint Goal:** a short expression of the purpose of a Sprint, often a business problem that is addressed
- **Sprint Retrospective:** time-boxed event of 3 hours, or less, to end a Sprint to inspect the past Sprint and plan for improvements

Agile Methodologies – Scrum Terminologies

- **Sprint Review:** time-boxed event of 4 hours, or less, to conclude the development work of a Sprint
- **Stakeholder:** a person external to the Scrum Team with a specific interest in and knowledge of a product that is required for incremental discovery
- **Development Team:** the role within a Scrum Team accountable for managing, organizing and doing all development work
- **Daily Scrum:** daily time-boxed event of 15 minutes for the Development Team to re-plan the next day of development work during a Sprint