

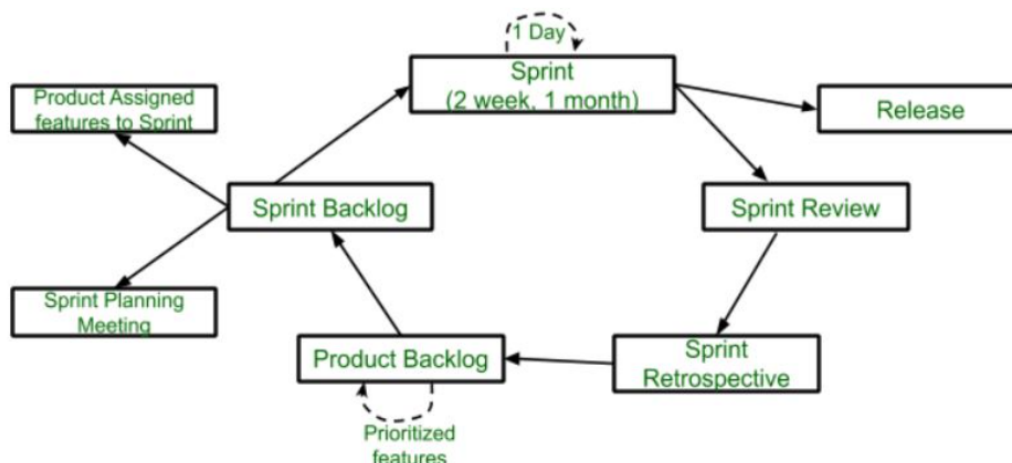
Unit 1

Definition of Software Engineering, Software Development Life Cycle (SDLC) – Phases, Traditional vs Agile Models (Waterfall, Agile, DevOps), Scrum Basics – Roles, Sprint, Backlog, Version Control using Git and GitHub, Introduction to Project Tools (GitHub Projects, Jira, Trello).

Scrum

- ❖ Scrum is a management framework that teams use to self-organize tasks and work towards a common goal. Scrum is aimed at sustaining strong collaboration between people working on complex products, and details are being changed or added.
- ❖ It is based upon the systematic interactions between the three major roles: Scrum Master, Product Owner, and the Team.
- ❖ Scrum Master is a central figure within a project. His principal responsibility is to eliminate all the obstacles that might prevent the team from working efficiently.
- ❖ Product Owner usually a customer or other stakeholder, is actively involved throughout the project, conveying the global vision of the product and providing timely feedback on the job done after every sprint.

Lifecycle of Scrum



Features of Scrum

- Scrum is a light-weighted framework
- Scrum emphasizes self-organization
- Scrum is simple to understand
- Scrum framework helps the team to work together

Advantage of Scrum framework

- Scrum framework is fast moving and money efficient.
- Scrum framework works by dividing the large product into small sub-products. It's like a divide and conquer strategy
- In Scrum customer satisfaction is very important.
- Scrum is adaptive in nature because it have short sprint.
- As Scrum framework rely on constant feedback therefore the quality of product increases in less amount of time

Disadvantage of Scrum framework

- Scrum frameworks do not allow changes into their sprint.
- Scrum framework is not fully described model.
- It can be difficult for the Scrum to plan, structure and organize a project that lacks a clear definition.
- The daily Scrum meetings and frequent reviews require substantial resources.

Product owner

The Scrum Product Owner is a key player in steering the project toward success. Acting as a link between stakeholders and the development team, their main goal is to get the most value from the product. This involves creating and managing a prioritized list of features called the Product Backlog and ensuring the team's work aligns with the overall vision.

The product owner is responsible for product management and ensures alignment with business goals. They manage the product backlog, define the sprint goal, and prioritise user stories based on stakeholder needs. Their involvement includes:

- Reviewing product backlog items before each sprint planning meeting
- Communicating updates and requirements to the scrum team.
- Collaborating with the development team to define deliverables for each new sprint.

Key Responsibilities of a Product Owner:

Defining and Prioritizing the Product Backlog: In this task, the Product Owner collaborates with stakeholders to gather detailed requirements for tasks, features, and improvements. Each item in the backlog is carefully defined to avoid confusion.

Communicating the Product Vision: Effective communication of the product vision involves more than just stating goals. The Product Owner ensures that every team

Taking an Overview of Development Stages: Product Owner oversees the progress of each stage, making sure that milestones align with the overall project timeline. Identifying potential challenges early allows for proactive problem-solving, contributing to smoother transitions between stages and maintaining project.

Making Decisions: Decision-making is a collaborative process where the Product Owner considers business value, technical feasibility, and stakeholder input.

Engaging with Stakeholders: The Product Owner ensures that stakeholder needs and expectations are understood and incorporated into the development process.

Evaluating Progress: Progress evaluation goes beyond tracking completion. The Product Owner assesses the quality of completed tasks against predefined acceptance criteria. Monitoring feedback from testing and end-users provides insights for refining and improving subsequent development stages.

Clear Vision: A good Scrum Product Owner needs to have a clear idea of where they want the product to go. They should understand both the big picture of what the business wants and the specific needs of the people who will use the product. This

helps guide the development team in the right direction.

Decisiveness: The Product Owner often has to make tough choices about which features to work on first. Being decisive means they can make good decisions, considering things like what's important for the business, what users want, and what's technically possible. It's about steering the ship in a fast-changing environment.

Effective Communication: Communication is key. The Product Owner has to explain complex ideas and requirements in a way that everyone - the development team and people outside the team - can understand. This ensures that everyone is on the same page, working together toward the same goals.

Customer Focus: Putting the customer first is fundamental. A good Product Owner really gets what the users need and makes sure those needs are reflected in what the development team is working on. This approach ensures the end product truly meets customer expectations.

Collaboration: Collaboration means working well with others. The Product Owner needs to collaborate smoothly with the development team, the Scrum Master, and other stakeholders. This teamwork helps share ideas, solve problems, and makes sure everyone is on board with the vision and priorities of the product.

Scrum master

The scrum master ensures that the team follows scrum events and practices outlined in the scrum guide. They remove obstacles, host daily stand-ups, and facilitate communication between the product owner and development team.

Scrum master is a person who helps other people to understand Scrum and serves the project team by removing obstacles. He also helps in simplifying project complexities.

The Scrum master also needs to make sure that development team works based on the core values of Scrum. He is often considered a coach for the team, helping the team do the best work they possibly can.

Their responsibilities include:

- Guiding the team through the sprint plan and ensuring adherence to agile principles.
- Organising sprint reviews and retrospectives.
- Promoting continuous improvement across iterations.

Scrum Master Responsibilities

Scrum master acts as the heart of the Scrum project.

Key responsibilities

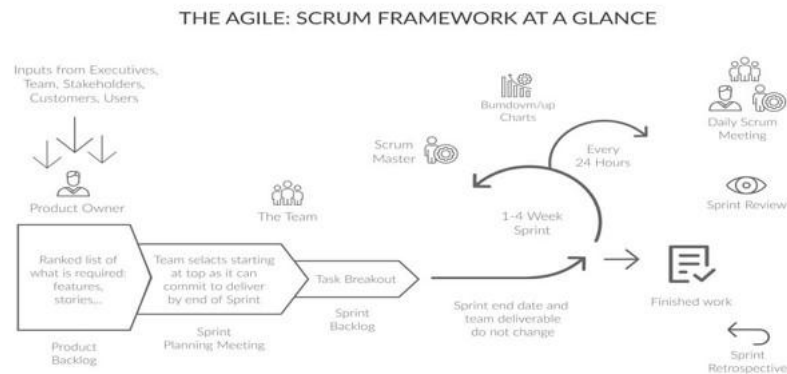
- Scrum Master needs to assure that team meets its business objectives.
- Scrum Master fosters a collaborative environment in the team
- The Scrum master does the planning, team backlog grooming, sprint demo, and sprint retrospective.
- Guides Scrum processes and helps to maintain the integrity of Scrum values
- Promote improved engineering practices like TDD, automated testing, and continuous integration.
- Making sure that every stakeholder should be present at the meeting at the given time

- Work with other team members to ensure that dependencies and risks are distributed across Scrum teams.
- Conducting feasibility studies, writing & validating specifications.

Development team

The development team executes the sprint backlog by completing work items that contribute to the sprint goal. Their responsibilities vary, from coding and testing to integrating components into the main product. Development teams may work independently or collaboratively, depending on the sprint's complexity and the project's requirements.

A Scrum Developer is a skilled team member responsible for turning product backlog items into working software during a sprint. They collaborate closely with other developers and the Scrum Team to ensure quality, efficiency, and alignment with sprint goals.



- Scrum Team is a cross-functional and self-organizing group of people that is responsible for the product implementation. It should consist of up to 7 team members, in order to stay flexible and productive.

Key Responsibilities:

- **Sprint Planning:** Participate in sprint planning sessions for task understanding, goal setting, and break down user stories into actionable items.
- **Code Development:** Write clean, functional code in alignment with the Sprint Backlog and product requirements.
- **Testing & Validation:** Conducted unit tests and validations to ensure features were working correctly and met the definition of done.
- **Collaboration:** Work closely with team members, the Product Owner, and the Scrum Master to align on progress and enable blocker resolving.
- **Daily Stand-ups:** Attend daily Scrum meetings to share updates, discuss challenges, and sync with the team.
- **Continuous Improvement:** Reflect on retrospective contributions and feedback to improve processes and team performance.
- **Documentation:** Maintain accurate code, workflows, and solutions documentation to support future development and maintenance.

Characteristics of a Developer:

- ❖ Team-Oriented
- ❖ Adaptable
- ❖ Detail-Focused
- ❖ Self-Organising
- ❖ Problem-solver.
- ❖ Quality Driven
- ❖ Continuous Learner

Sprint :

A sprint is a short and fixed time frame during which a specific set of tasks are meant to be performed. An Agile project will be broken down into a certain number of sprints, each sprint lasting for a fixed duration of time. Usually, each sprint runs for 2–4 weeks. A Sprint Planning Meeting occurs before the start of every sprint

Sprint: A Sprint is a time box of one month or less. A new Sprint starts immediately after the completion of the previous Sprint.

Release: When the product is completed, it goes to the Release stage.

Sprint Review: If the product still has some non-achievable features, it will be checked in this stage and then passed to the Sprint Retrospective stage.

Sprint Retrospective: In this stage quality or status of the product is checked.

Product Backlog: According to the prioritize features the product is organized.

Sprint Backlog: Sprint Backlog is divided into two parts Product assigned features to sprint and Sprint planning meeting

Backlog

- Product Backlog is the primary list of work that the product owner or product manager needs to do and maintain. This is a dynamic list of features, requirements, enhancements, and fixes that acts as the input for the sprint backlog.
- It is, essentially, the team’s “To Do” list.
- Sprint is the list of items, user stories, or bug fixes, selected by the development team for implementation in the current sprint cycle. Before each sprint during sprint planning, the team selects items it will work on from the backlog.

