***What is scrum?***

*Scrum is an agile project management framework that helps teams’ structure and manage their work through a set of values, principles, and practices. Scrum encourages teams to learn through experiences, self-organize while working on a problem, and reflect on their wins and losses to continuously improve.*

*Scrum is a lightweight framework that helps people, teams and organizations generate value through adaptive solutions for complex problems. Scrum is simple. Try it as is and determine if its philosophy, theory, and structure help to achieve goals and create value.*

***Scrum Theory –***

*Scrum is founded on empiricism and lean thinking. Empiricism asserts that knowledge comes from experience and making decisions based on what is observed. Lean thinking reduces waste and focuses on the essentials.*

*Scrum employs an iterative, incremental approach to optimize predictability and to control risk.*

* *Transparency - The emergent process and work must be visible to those performing the work (development team) as well as those receiving the work (client, PO). Transparency enables inspection. Inspection without transparency is misleading and wasteful.*
* *Inspection - The Scrum artifacts and the progress toward agreed goals must be inspected frequently and diligently to detect potentially undesirable variances or problems. Inspection enables adaptation. Inspection without adaptation is considered pointless.*
* *Adaptation - If any aspects of a process deviate outside acceptable limits or if the resulting product is unacceptable, the process being applied, or the materials being produced must be adjusted. The adjustment must be made as soon as possible to minimize further deviation. Adaptation becomes more difficult when the people involved are not empowered or self-managing.*

*Scrum Values -Successful use of Scrum depends on people becoming more proficient in living five values:*

*Commitment, Focus, Openness, Respect, and Courage*

*Scrum Team*

*The fundamental unit of Scrum is a small team of people, a Scrum Team. The Scrum Team consists of one Scrum Master, one Product Owner, and Developers. Within a Scrum Team, there are no sub-teams or hierarchies. It is a cohesive unit of professionals focused on one objective at a time, the Product Goal. They are self-managing & they internally decide who does what, when, and how. The Scrum Team is small enough to remain nimble and large enough to complete significant work within a Sprint, typically 10 or fewer people. The Scrum Team is responsible stakeholder collaboration, verification, maintenance, operation, experimentation, research and development, and anything else that might be required.*

* *Developers - Developers are the people in the Scrum Team that are committed to creating any aspect of a usable Increment each Sprint. Developers are always accountable for*
  + - *Creating a plan for the Sprint, the Sprint Backlog.*
    - *Instilling quality by adhering to a Definition of Done.*
    - *Adapting their plan each day toward the Sprint Goal.*
    - *Holding each other accountable as professionals.*
* *Product Owner - The Product Owner is accountable for maximizing the value of the product. He is also accountable for effective Product Backlog management. The Product Owner is one person, not a committee. Product Backlog can be change by convincing the Product Owner.*
  + - *Developing and explicitly communicating the Product Goal.*
    - *Creating and clearly communicating Product Backlog items.*
    - *Ordering Product Backlog items.*
    - *Ensuring that the Product Backlog is transparent, visible, and understood.*
  + *Scrum Master - The Scrum Master is accountable for establishing Scrum. They do this by practice, both within the Scrum Team and the organization. He/she is accountable for the Scrum Team’s effectiveness. Scrum Masters are true leaders who serve the Scrum Team and the larger organization.*

*The Scrum Master serves the Scrum Team in several ways, including:*

* + - *Coaching the team members in self-management and cross-functionality.*
    - *Helping the Scrum Team focus on creating high-value Increments that meet the Definition of Done.*
    - *Causing the removal of impediments to the Scrum Team’s progress.*
    - *Ensuring that all Scrum events take place and are positive, productive, and kept within the timebox.*

*The Scrum Master serves the Product Owner in several ways, including:*

* + - *Helping find techniques for effective Product Goal definition and Product Backlog management.*
    - *Helping the Scrum Team understand the need for clear and concise Product Backlog items.*
    - *Helping establish empirical product planning for a complex environment.*
    - *Facilitating stakeholder collaboration as requested or needed.*

*The Scrum Master serves the organization in several ways, including:*

* + - *Leading, training, and coaching the organization in its Scrum adoption.*
    - *Planning and advising Scrum implementations within the organization.*
    - *Helping employees and stakeholders understand and enact an empirical approach for complex work.*
    - *Removing barriers between stakeholders and Scrum Teams.*

*Scrum Events - The Sprint is a container for all other events. Each event in Scrum is a formal opportunity to inspect and adapt Scrum artifacts. These events are specifically designed to enable the transparency required. Failure to operate any events as prescribed results in lost opportunities to inspect and adapt.*

*The Sprint - Sprints are the heartbeat of Scrum, where ideas are turned into value. They are fixed length events of one month or less to create consistency. A new Sprint starts immediately after the conclusion of the previous Sprint.*

*During the Sprint:*

* *No changes are made that would endanger the Sprint Goal.*
* *Quality does not decrease.*
* *The Product Backlog is refined as needed.*
* *Scope may be clarified and renegotiated with the Product Owner as more is learned.*

*Sprints enable predictability by ensuring inspection and adaptation of progress toward a Product Goal. Shorter Sprints can be employed to generate more learning cycles and limit risk of cost and effort to a smaller time frame. Various practices exist to forecast progress, like burn-downs, burn-ups, or cumulative flows. A Sprint could be cancelled if the Sprint Goal becomes obsolete. Only the Product Owner has the authority to cancel the Sprint.*

*Sprint Planning - Sprint Planning initiates the Sprint by laying out the work to be performed for the Sprint. This resulting plan is created by the collaborative work of the entire Scrum Team. The Product Owner ensures that attendees are prepared to discuss the Product Backlog items and how they map to the Product Goal. The Scrum Team may also invite other people to attend Sprint Planning to provide advice.*

*Sprint Planning addresses the following topics:*

* *Why is this Sprint valuable - The Product Owner proposes how the product could increase its value. The whole Scrum Team then collaborates to define a Sprint Goal. The Sprint Goal must be finalized prior to the end of Sprint Planning.*
* *What can be Done this Sprint - Through discussion with the Product Owner, the Developers select items from the Product Backlog to include in the current Sprint. The Scrum Team may refine these items during this process. Developers know about their past performance, their upcoming capacity, and their Definition of Done, the more confident they will be in their Sprint forecasts.*
* *How will the chosen work get done - Developers plan the work necessary to create an Increment that meets the Definition of Done. This is often done by decomposing Product Backlog items into smaller work items of one day or less. Sprint Planning is timeboxed to a maximum of eight hours for a one-month Sprint.*

*Daily Scrum - The purpose of the Daily Scrum is to inspect progress toward the Sprint Goal and adapt the Sprint Backlog as necessary, adjusting the upcoming planned work. The Daily Scrum is a 15-minute event for the Developers of the Scrum Team. It is held at the same time and place every working day of the Sprint. If the Product Owner or Scrum Master are actively working on items in the Sprint Backlog, they participate as Developers. The Developers can select whatever structure and techniques they want, as long as their Daily Scrum focuses on progress toward the Sprint Goal and produces an actionable plan for the next day of work. Daily Scrums improve communications, identify impediments, promote quick decision-making, and consequently eliminate the need for other meetings. The Daily Scrum is not the only time Developers are allowed to adjust their plan. They often meet throughout the day for more detailed discussions about adapting or re-planning the rest of the Sprint’s work.*

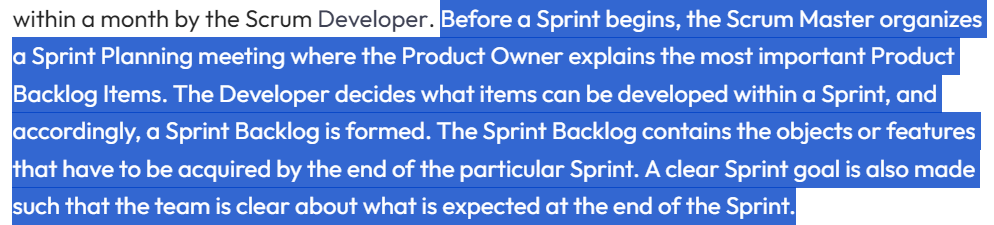
*Sprint Review - The purpose of the Sprint Review is to inspect the outcome of the Sprint and determine future adaptations. The Scrum Team presents the results of their work to key stakeholders and progress toward the Product Goal. During the event, the Scrum Team and stakeholders review what was accomplished in the Sprint and what has changed in their environment. The Product Backlog may also be adjusted to meet new opportunities. The Sprint Review is a working session, and the Scrum Team should avoid limiting it to a presentation.*

*Sprint Retrospective - The purpose of the Sprint Retrospective is to plan ways to increase quality and effectiveness. The Scrum Team inspects how the last Sprint went with regards to individuals, interactions, processes, tools, and their Definition of Done. The Scrum Team discusses what went well during the Sprint, what problems it encountered, and how those problems were (or were not) solved. The Scrum Team identifies the most helpful changes to improve its effectiveness. The most impactful improvements are addressed as soon as possible. They may even be added to the Sprint Backlog for the next Sprint. The Sprint Retrospective concludes the Sprint. It is timeboxed to a maximum of three hours for a one-month Sprint.*

*Scrum Artifacts*

*Product Backlog - A product backlog is a prioritized list of work for the development team that is derived from the roadmap and its requirements. The most important items are shown at the top of the product backlog so the team knows what to deliver first. The development team doesn't work through the backlog at the product owner's pace and the product owner isn't pushing work to the development team. Instead, the development team pulls work from the product backlog as there is capacity for it.*

*Release backlog: Features that need to be implemented for a particular release.*

*Sprint backlog: User stories that need to be completed during a specific period of time. The sprint backlog comes from the product backlog, but it contains only the product backlog items that can be completed during each agile sprint. *

*What are stories, epics, and initiatives?*

* *A user story is the smallest unit of work in an agile framework. It’s an end goal, not a feature, expressed from the software user’s perspective. A user story is an informal, general explanation of a software feature written from the perspective of the end user or customer. The purpose of a user story is to articulate how a piece of work will deliver a particular value back to the customer.*
* *Epics are a helpful way to organize your work and to create a hierarchy. The idea is to break work down into shippable pieces so that large projects can actually get done and you can continue to ship value to your customers on a regular basis. Epics help teams break their work down, while continuing to work towards a bigger goal.*
* *Initiatives are collections of epics that drive toward a common goal.*

*What is Story point Estimation - When the engineering team begins its estimation process, questions usually arise about requirements and user stories. And that's good: those questions help the entire team understand the work more fully. For product owners specifically, breaking down work items into granular pieces and estimates via story points helps them prioritize all (and potentially hidden!) areas of work. And once they have estimates from the dev team, it's not uncommon for a product owner to reorder items on the backlog.*

*Definition of Done vs Acceptance Criteria - Definition of Done (DoD) is a list of requirements that a user story must adhere to for the team to call it complete. While the Acceptance Criteria of a User Story consist of set of Test Scenarios that are to be met to confirm that the software is working as expected. The DoD is common for all the User Stories whereas the Acceptance Criteria is applicable to specific User Story. Acceptance Criteria of each User Story will be different based on the requirements of that User Story.*

*Both DoD and Acceptance Criteria must be met in order to complete the User Story.*

*The definition of Done is structured as a list of items, each one used to validate a Story, which exists to ensure that the Development Team agree about the quality of work they’re attempting to produce. It serves as a checklist that is used to check each Product Backlog Item.*

*Example – Definition of Done –*

* *Code peer reviewed?*
* *Code completed?*
* *Code reviewed?*
* *Code checked-in?*
* *Unit tests passed?*
* *Functional tests passed?*
* *Acceptance tests completed?*
* *Product Owner reviewed and accepted?*

*Acceptance Criteria - The acceptance criteria gives guidance about the details of said functionality and how the customer will accept them. Some of the Acceptance Criteria will be discovered in Ongoing Backlog Refinement events before the Sprint starts, and others will be discovered right after Sprint Planning.*

*The goals of Acceptance Criteria –*

* *Clarify what the team should build before they start work*
* *Ensure everyone has a common understanding of the problem*
* *Help the team members know when the Story is complete*
* *Help verify the Story via automated tests.*

*Example – Acceptance Criteria*

* *A user cannot submit a form without completing all the mandatory fields*
* *Information from the form is stored in the registrations database*
* *Payment can be made via credit card*
* *An acknowledgment email is sent to the user after submitting the form*

*Velocity Chart - Velocity is how a scrum team measures the amount of work they can complete in a typical sprint. Velocity is measured historically, from one sprint to the next. By tracking the number of story points the team can complete according to their own definition of done, they can build up a reliable and predictable sense of how long it will take them to complete new stories based on their relative point value.*

*Keeping track of the velocity is the responsibility of the scrum master. At the end of each sprint demo, the scrum master should calculate the number of points that were estimated for the stories.*

*Velocity in Scrum is a critical metric that helps teams estimate the amount of work they can complete in a given time frame, typically a sprint. It is calculated by adding up the estimates of the work (usually in story points) completed in the last sprint. This provides a useful benchmark for planning future sprints.*

*Improving a team’s velocity involves enhancing their efficiency and effectiveness. This could be achieved through regular retrospectives to identify and address issues, providing necessary training and resources, improving communication and collaboration, and fostering a supportive work environment.*

*Burndown Chart - A burndown chart shows the team’s progress toward completing all of the points they agreed to complete within a single sprint. This chart starts with the total number of points the team has taken on for the sprint, and tracks on a day-to-day basis how many of those points have been completed and are ready for the sprint demo.*

*The burndown chart is usually maintained by the scrum master, and may be updated on a daily basis, perhaps after the daily stand up.*

*A typical burndown chart starts with a straight diagonal line from the top left to the bottom right, showing an “ideal” burndown rate for the sprint.*

*Burndown charts are visual representations of work left to do versus time. They provide a quick overview of the project’s progress and the amount of work remaining. This helps teams and stakeholders understand if the project is on track to meet its deadlines.*

*If the burndown chart indicates the project isn’t on track, it’s crucial to identify and address the issues causing the delay. This could involve re-evaluating task estimates, removing blockers, increasing resources, or adjusting the scope of work.*