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**Agile and Scrum Methodologies**

Agile scrum methodology is a project management system that relies on incremental development. Each iteration consists of two- to four-week sprints, where the goal of each sprint is to build the most important features first and come out with a proper end product. Agile scrum methodology is used by companies of all sizes for its ability to provide high-end collaboration and efficiency for project-based work. Agile and scrum are two different methods and can be used separately; however, their combined benefits make the agile scrum methodology the most popular use of agile.

**Working of agile scrum**

* Agile scrum methodology is the combination of the agile philosophy and the scrum framework.
* Agile means “incremental, allowing teams to develop projects in small increments. Scrum is one of the many types of agile methodology, known for breaking projects down into sizable chunks called “sprints.”
* Agile scrum methodology is good for businesses that need to finish specific projects quickly.
* Agile scrum methodology is a project management system that relies on incremental development.
* Each iteration consists of two- to four-week sprints, where the goal of each sprint is to build the most important features first and come out with a potentially deliverable product.
* More features are built into the product in subsequent sprints and are adjusted based on stakeholder and customer feedback between sprints.

**What is agile?**

Agile is a process that allows a team to more efficiently manage a project by breaking it down into several stages, each of which allows for consistent collaboration with stakeholders to promote steady improvements at every stage.

**What is scrum?**

Scrum is a framework for effective collaborations among teams working on complex products. Scrum is a type of agile technology that consists of meetings, roles, and tools to help teams working on complex projects collaborate and better structure and manage their workload. Although it is most often used by software development teams, scrum can be beneficial to any team working toward a common goal.

**Benefits of agile scrum methodology:**

* Increased Flexibility: Agile Scrum allows for flexibility in project requirements and scope. It embraces change and enables teams to respond quickly to evolving customer needs, market trends, and technological advancements. The iterative approach allows for regular feedback and adjustments, ensuring the final product meets the stakeholders' expectations.
* Faster Delivery of Value: Scrum promotes iterative and incremental development, with regular product increments delivered at the end of each sprint. This allows for early and frequent delivery of working software or tangible results, providing value to customers and stakeholders earlier in the project lifecycle.
* Enhanced Customer Collaboration: Scrum encourages close collaboration between the development team and the customer or product owner. The customer is actively involved in the development process, providing feedback and clarifying requirements during sprint reviews and other interactions. This collaboration helps ensure the product meets customer expectations and minimizes the risk of delivering a solution that doesn't align with their needs.
* Improved Transparency: Agile Scrum promotes transparency at all levels. The use of visual artifacts like product backlogs, sprint backlogs, and burndown charts provides clear visibility into the project's progress, upcoming work, and potential impediments. This transparency helps teams and stakeholders make informed decisions, identify bottlenecks, and address issues promptly.
* Higher Quality Deliverables: The iterative nature of Scrum allows for continuous testing, integration, and validation throughout the development process. By frequently reviewing and refining the product, teams can identify and address issues earlier, resulting in higher quality deliverables. The focus on incremental delivery also enables frequent feedback loops, ensuring that customer requirements are met and reducing the risk of building a product that does not meet their needs.
* Increased Team Collaboration and Ownership: Scrum emphasizes self-organizing and cross-functional teams. It encourages collaboration, knowledge sharing, and collective decision-making. The team members take ownership of their work and are empowered to make decisions, fostering a sense of accountability and motivation.
* Continuous Improvement: Scrum incorporates regular retrospectives, where the team reflects on their processes, identifies areas for improvement, and creates action plans to implement those changes. This continuous improvement mindset helps teams optimize their workflows, enhance productivity, and deliver better results with each sprint.
* Lower costs: A study found that the majority of features delivered in traditional waterfall projects were never used or needed by customers, due to scope creep and feature bloat. With Scrum, you are ruthlessly pruning the release backlog after each sprint so these unnecessary features (and their associated costs) are quickly weeded out. The short-time boxes reduce the likelihood of risks materializing during the sprint and thus address increment delivery.
* Organisational Synergy: Scrum lets team members from a variety of disciplines harness their different skills in a cross-cutting product development ethos. This ensures that the finished product is optimized by and uses the best skills in the organization, not just what’s written on someone’s job title.
* Employee satisfaction: With the flexibility to adjust scope and still deliver results, the problem of delivering a fixed scope, fixed-schedule project with a team goes away. Instead of long nights frantically replanning and retesting functionality, the team has a sustainable operating pace that makes employees proud of their work and not fighting to deliver against impossible deadlines.
* Customer satisfaction: One of the challenges of software development for customers is that they cannot often appreciate the functionality of a system until they see it. By delivering working functionality in small increments, customers can see what they are getting earlier in the process and be confident that it is what they actually need or expect.

**Different roles in agile scrum methodology:**

1. **Scrum Master:**

The Scrum Master is a key role in the Agile Scrum methodology. Their primary responsibility is to facilitate the Scrum process and ensure that the team follows Agile principles and practices. Some of their key responsibilities includes:

1. Facilitating Scrum Events: The Scrum Master organizes and facilitates the various Scrum events, including sprint planning, daily scrum meetings, sprint review, and sprint retrospective. They ensure that these events are productive, timeboxed, and focus on achieving the desired outcomes.
2. Removing Impediments: The Scrum Master identifies and helps to remove any obstacles or impediments that hinder the team's progress. This could involve addressing issues related to resources, dependencies, organizational policies, or any other factors that may affect the team's ability to deliver.
3. Promoting Self-Organization: The Scrum Master encourages and supports the team in becoming self-organizing. They foster an environment where team members take ownership of their work, collaborate effectively, and make decisions collectively. The Scrum Master facilitates discussions and empowers the team to find their own solutions.
4. Ensuring Agile Principles and Practices: The Scrum Master helps the team and the organization understand and adopt Agile principles and practices. They educate stakeholders about the benefits of Agile Scrum, facilitate the implementation of Agile processes, and promote a culture of continuous improvement.
5. Protecting the Team: The Scrum Master acts as a shield for the team, protecting them from external interruptions and unnecessary distractions. They ensure that the team can focus on their work during the sprint and maintain a sustainable pace.
6. Monitoring Progress and Metrics: The Scrum Master keeps track of the team's progress, velocity, and other relevant metrics. They may use tools like burndown charts or cumulative flow diagrams to visualize and communicate the team's progress to stakeholders. This helps in identifying potential issues early and taking corrective actions.
7. Coaching and Mentoring: The Scrum Master serves as a coach and mentor to the team members, product owner, and other stakeholders. They provide guidance on Agile principles and practices, facilitate learning opportunities, and help individuals and the team improve their skills and performance.
8. Continuous Improvement: The Scrum Master facilitates the sprint retrospective, where the team reflects on their processes and identifies areas for improvement. They work with the team to implement changes and experiments to enhance productivity, quality, and collaboration.
9. **Product owner:**

The Product Owner is a crucial role in the Agile Scrum methodology. They represent the stakeholders, customers, and end-users and are responsible for maximizing the value delivered by the team. Here are the key responsibilities and functions of a Product Owner:

* Defining and Prioritizing the Product Backlog
* Setting the Product Vision and Goals
* Collaborating with Stakeholders
* Participating in Scrum Events
* Making Decisions and Trade-offs
* Ensuring a Clear Definition of
* Adapting to Change

1. **Scrum Team:**

The scrum team is a self-organized group of three to nine individuals who have the business, design, analytical and development skills to carry out the actual work, solve problems and produce deliverable products. Members of the scrum team self-administer tasks and are jointly responsible for meeting each sprint’s goals.

1. **Ancillary roles:**

Ancillary roles, on the other hand, are other stakeholders who are involved in, but not committed to, the scrum project. Typically, ancillary roles consist of customers, management and members of the executive team who are involved for the purpose of consulting, reporting progress and gathering feedback to better work toward delivering the highest value possible.

**Differences between Agile and Scrum Methodology:**

* The primary difference between Agile and Scrum is that Agile is a project management philosophy that employs a fundamental set of values or principles, whereas Scrum is a precise Agile methodology utilized to facilitate a project.
* The key difference between Agile and Scrum is that Scrum is a highly successful methodology for delivering software to a customer, while Agile is a philosophy about how to deliver software to a customer.
* Agile and Scrum differ fundamentally in the sense that Scrum is a methodology that software development teams follow while Agile is a philosophy about how software is delivered to customers.
* Scrum is an Agile process aimed at delivering business value in the shortest possible time, whereas Agile is a continuous iteration of development and testing.
* In Agile methodology, software is delivered on a regular basis for feedback, whereas in Scrum methodology, software is delivered after each sprint of development.
* Agile and Scrum share similar methods like collaborative iterations, and for a good reason: Scrum is an Agile approach. But while both involve incremental builds for projects, they also have their differences. Scrum is a more rigid method with less flexibility for change, and it’s ideal for those who need to produce results as quickly as possible. Agile is more suited for smaller teams and for those who prefer a more straightforward design and execution, while Scrum is used more for creative and experimental approaches.
* It's best to look at it this way: Scrum is always Agile, but Agile is not always Scrum. This means Scrum will encompass the same methodologies of Agile, but Agile may not share some of the same qualities as Scrum.

**Scrum in Software Development:**

One of the most popular agile methodologies in use today, Scrum is a lightweight software development methodology that focuses on having small time-boxed sprints of new functionality that are incorporated into an integrated product baseline. Scrum places an emphasis on transparent customer interaction, feedback and adjustments rather than documentation and prediction. Instead of phases, Scrum projects are broken down into releases and sprints.

With Scrum projects, the requirements for the project do not have to be codified up-front, instead they are prioritized and scheduled for each sprint. The requirements are composed of user stories that can be scheduled into a particular release and sprint.

Scrum is often deployed in conjunction with other agile methods such as Extreme Programming (XP), since such methods are mostly complimentary. In this example, XP focuses on the engineering (continuous exploration, continuous integration, test-driven development, etc.), and Scrum focuses on the project management side (burn-down, fixed scope for sprints/iterations) as part of the product management.