

Scrum Process and Roles

The Scrum Process is a framework for efficient project management. It fosters collaboration among stakeholders, product owners, and development teams. Its iterative approach, organized into sprints with defined goals and continuous improvement makes it particularly suitable for addressing complex and evolving challenges in technological development. The product owner is responsible for managing the product backlog and makes decisions about whether to release increments to customers. The development team is tasked with creating and testing features. The scrum master supports the development team in practicing scrum methodologies and safeguards them from external interference. Stakeholders have a vested interest in the product being developed by the team.

When applied to the development lifecycle of a driverless car self-parking application, the Scrum framework is seamless. The project team, including developers, product owners, and other stakeholders, will collaborate within sprints to enhance specific aspects of the self-parking functionality. Each sprint may focus on critical features such as automated parking spot detection, user interface interaction, real-time monitoring, collision avoidance systems, and integration with smart infrastructure.

The sprint planning sessions become instrumental in outlining the objectives and tasks for each sprint, ensuring that the development aligns with the overall project goals. Daily stand-up meetings facilitate open communication among team members, addressing any challenges and ensuring that the development stays on course. Sprint reviews and retrospectives provide opportunities for the team to reflect on achievements, receive feedback, and plan for continuous refinement in subsequent sprints.

Crucial artifacts like burndown charts and backlogs play a significant role in tracking the project's progress and prioritizing features based on user needs and feedback. The Scrum Process, with its emphasis on adaptability and collaboration allows the development team to respond promptly to changing requirements and integrate user feedback effectively.

This integration of Scrum with the development of a driverless car self-parking application not only highlights the framework's flexibility but also its ability to address the intricate and evolving nature of technological challenges. By fostering a collaborative and iterative approach, Scrum ensures that the self-parking application evolves, meets user expectations, and continuously improves throughout its development lifecycle.

Sprint 1 Planning Process:

Participants:

- **Product Owner:** Collaborates with the development team to enhance the value and functionality of the driverless car self-parking application during the current sprint. In consultation with developers, selects specific features or improvements from the backlog that align with stakeholder needs and the overall product vision. Focuses on optimizing the self-parking capabilities and user experience.
- **Development Team:** Works closely with the product owner and scrum master to establish a Sprint Goal that clearly communicates the value of the sprint to stakeholders, emphasizing advancements in the self-parking functionality. Collaborates with the product owner to choose backlog items relevant to improving the driverless car's self-parking capabilities. Plans the implementation by breaking down tasks into smaller work items, ensuring each can be completed within a day or less, and aligns with the Definition of Done.
- **Scrum Master:** Facilitates the sprint planning meeting for the driverless car self-parking application, guiding discussions on the sprint goal and ensuring that the selected backlog items contribute to the overall vision of the product. Ensures that the planning process adheres to the principles of the Scrum framework and provides support to the development team and product owner in achieving their objectives.

Work Products:

Sprint Backlog:

- A focused subset of features selected from the product backlog for the current sprint. These features are chosen by the product owner and development team to align with the sprint goal. The selected features are intended to deliver incremental value and improvements to the driverless car self-parking application. The sprint backlog serves as the blueprint, defining the precise scope of work to be undertaken during the sprint, with the overarching aim of advancing the capabilities and user experience of the self-parking functionality.

Sprint Goal:

- A clear definition of the business purpose for the tasks undertaken in the current sprint, specifically tailored to the driverless car self-parking application. For example, the sprint goal could be centered around improving the efficiency of parking maneuvers, enhancing the user

interface for seamless interaction, or addressing specific user feedback related to the self-parking functionality.

Definition of Done:

- A set of criteria that must be met for a feature or task to be considered complete within the context of the driverless car self-parking application. This includes not only functional aspects but also quality, testing, and documentation requirements to ensure that each increment aligns with the overall standards and expectations for the application.

Roles and Deliverables:

- **Product Owner:** The product owner identifies needed features for the sprint backlog. In the automatic parking application, the product owner will define features such as parking spot detection, automatic maneuvering to the parking spot, autonomous parallel parking, autonomous valet parking, etc.
- **Developers:** The developers identify the tasks required to deliver features. For example, they may identify how the system detects parking spots. They may also identify how the car autonomously maneuvers to the parking spot and how the system autonomously parallel parks the car. These features may go into the product backlog. The developers develop a task list and also compute the time needed to complete the task list. For instance, they will estimate how much effort is required to complete the parking spot detection task.
- **Scrum Master:** Facilitates the meeting, ensures understanding, and addresses parking application-specific challenges. Specifically, they will ensure that the team understands the unique challenges of developing automatic parking features and also that the planning process is adapted to the challenges specific to the automatic parking application.

Deliverables:

- **Sprint Backlog:** Collaboratively generated by the Product Owner and Development Team at the start of Sprint 1. The Product Owner is responsible for prioritizing and delivering a refined list, while the Development Team initiates and completes the tasks within the backlog.
- **Sprint Goal:** Defined during the Sprint Planning Meeting at the start of Sprint 1, with the Product Owner and Development Team working together to articulate a clear business purpose. The Scrum Master ensures understanding and facilitates the collaborative process.
- **Definition of Done:** Created by the Development Team for each task within the Sprint Backlog. This ownership ensures that the criteria for completion,

encompassing functional aspects, quality standards, testing, and documentation, are well-established and adhered to during development.

- **Facilitated Sprint Planning Meeting:** Led by the Scrum Master at the beginning of Sprint 1, the meeting involves collaboration between the Product Owner and Development Team. The Scrum Master ensures the team comprehensively understands the Sprint Goal, Backlog items, and Definition of Done. They continue to provide ongoing support to address challenges specific to the automatic parking application.

Day-to-Day Activities During Sprint 1:

Participants:

- **Development Team:** Collaborates daily to discuss progress, challenges, and plan for the next 24 hours, specifically focusing on automatic parking feature development. Developers report on what they did since the last Scrum, what they will do before the next Scrum, and what impediments require action. For example developers may report on improvements made to parking spot detection related tasks or issues related to parking spot detection. Developers will create a new build at least one per day. This is to ensure that the automatic parking features are integrated and tested continuously, allowing for early detection of issues and providing a basis for regular demonstrations.
- **Scrum Master:** Ensures the team follows Scrum practices tailored for the automatic parking application and addresses any related impediments. This may involve incorporating continuous integration for real-time testing, organizing regular demonstrations to showcase incremental progress, and adapting sprint plans based on emerging sensor technologies. They also will address impediments specific to the driverless car parking application, such as real-time data processing bottlenecks and integration challenges with external systems.
- The product owner is optional here

Work Products:

- The work products for daily standups are daily standup meeting notes, incremental deliverables, status/progress updates, and a new build. For example, developers may report on successful integration of a parallel parking algorithm or improvements made to the accuracy of parking spot detection. Developers may also share insights into the latest build or integration progress specific to the driverless car parking application. This may include updates on successfully

integrated features or improvements made to the overall functionality of the automatic parking application within the driverless car context.

End of Sprint 1:

Participants:

- Product Owner: Reviews the completed automatic parking features against the sprint goal, ensuring they align with the strategic vision of the automatic car parking application.
- Development Team: Demonstrates the fully integrated automatic parking increment, showcasing successful features such as Automated Parallel Parking and Adaptive Parking Spot Detection.
- Stakeholders: Engage in a collaborative session with the product owner and Development Team to witness the demonstrated automatic parking features, providing detailed feedback and insights.
- Scrum Master: Facilitates the Sprint Review meeting, ensuring that it stays focused on the accomplishments of the development team and the alignment with the sprint goal. They address any impediments or challenges that arose during Sprint 1. They collaborate with the product owner to prioritize and refine the backlog based on the feedback from stakeholders. They also conduct a retrospective with the Development Team to identify areas for improvement in the team's processes and practices. Additionally they update and maintain relevant documentation, such as burndown charts and velocity metrics, to provide insight into the team's progress.

Sprint Review and Planning:

Review of Progress:

- The product owner evaluates the demonstrated automatic parking features against the prioritized product backlog, ensuring the delivered functionality meets the high-level goals set for the automatic car parking application.
- The team, including developers with expertise in machine learning and sensor technology, highlights achievements related to algorithm integration and accuracy improvements in parking spot detection.

Re-estimation and Update of Features:

- The team discusses any changes needed in the estimated effort or priority of automatic parking features based on the insights gained during the sprint.
- For instance, if user feedback suggests a preference for specific parking scenarios, The product owner and the team may reevaluate the priority and effort estimates for those features.

Product Architecture Update:

- The product owner and development team engage in discussions about the evolving product architecture specific to the automatic car parking features.
- This involves considering any adjustments or enhancements necessary for seamless integration, such as refining the communication between the parking algorithm and sensor technologies.

Reflection and Brainstorming for Next Sprint:

- The team acknowledges success, challenges, and areas for improvement and brainstorm for the next sprint

Sprint Retrospective:

Reflection on Automatic Parking Feature Development:

- The Scrum Master, alongside the Automatic Parking Development Team, conducts a sprint retrospective, focusing on what went well during the development of automatic parking features and areas that need improvement.
- Positive aspects might include successful integration of machine learning algorithms, while improvement areas may involve refining the precision of parking spot detection.

Brainstorming and Planning for Improvement:

- The team engages in a brainstorming session, specifically targeting enhancements in the automatic car parking feature development process.
- For instance, if there were challenges in optimizing real-time data processing for accurate parking spot detection, the team brainstorms solutions and strategies for improvement in the next iteration.

Next Sprint Planning for Automatic Parking Feature:

- With insights gained from the retrospective, the team starts planning for the next sprint, determining which specific automatic parking features are crucial for implementation.
- The product owner revisits and refines the product backlog for automatic parking, considering the latest priorities, user feedback, and technological advancements to ensure the continuous improvement of the driverless car parking application's automatic features.

Work Products:

- Sprint Review: Demo of completed automatic parking features.
- Sprint Retrospective: Team reflection on the sprint, identifying areas for improvement, especially in the context of developing the automatic parking application - a list of improvements is created out of this.
- Revised Product Backlog: A refined and updated product backlog that reflects any changes in priority, effort estimates, or new feature requirements discussed during the Sprint Review.

Progress Measurement:

- The team measures progress by tracking the backlog through a scrum board. This board contains columns User Story, To Do, In Progress, Blocked, and Done to track the progress of the user stories. This captures what is being done in the sprint, if there are any issues that come up, and what is finished.
- Daily standup - Each member of the team gives their status for the task they worked on the previous day, the task they're going to work on for the day, and any impediments that will keep them from completing the task for the day.
- Sprint Burndown Chart: Illustrates the progress of automatic parking feature development throughout the sprint. This chart shows the remaining work vs the time as well as the estimated vs actual

Adjusting Priorities:

- Product Owner: The product owner is primarily responsible for setting priorities based on business goals, user feedback, and market requirements. They can also adjust priorities based on feedback, market changes, or emerging requirements related to automatic parking features. The product owner regularly refines the product backlog, ensuring that it reflects the latest understanding of user needs, market trends, and technological advancements. This ongoing refinement process allows for the adjustment of priorities based on changing circumstances.

- Sprint Planning Meetings: Priorities can be adjusted during sprint planning to accommodate changes in the automatic parking application's development focus based on team capacity and feedback.
- End of each sprint: At the end of each sprint, during the sprint review and planning sessions, the team and the product owner collectively reevaluate priorities. They consider feedback from stakeholders, the success of implemented features, and any changes in business objectives.
- The team can make adjustments based on continuous feedback received during daily standups, stakeholder interactions, and demonstrations of completed features. If unforeseen challenges or opportunities arise, priorities can be revisited and adapted accordingly.