ParkEase

Team members

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Undergraduate Project Proposal

Group No. 1

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1) Problem Statement

In modern cities, finding a parking spot that requires payment can be an arduous task, leading to frustration and significant loss of time for drivers. The challenge is intensified by a lack of immediate access to information about the availability of parking spaces across a variety of locations, such as shopping centers, entertainment venues, office buildings, and residential areas. Current solutions to find and reserve parking spaces often fall short in convenience and efficiency, contributing to increased traffic congestion and deterring individuals from visiting certain locations, which in turn can negatively impact local businesses and the overall urban experience. Our project, **ParkEase**, introduces a comprehensive, technologically advanced solution aimed at revolutionizing how drivers find and reserve parking spots, thereby enhancing urban mobility and convenience for city dwellers.

2) Objectives

- **Develop a User-Friendly Mobile Application**: Create ParkEase, a mobile application using Flutter and Dart, designed to offer a seamless interface for users to find, reserve, and pay for parking spots across various urban locations.

- **Implement a Real-Time Database**: Ensure ParkEase integrates with a real-time database, providing users with current information on the availability of paid parking spots

- **Ensure High-Level Accuracy**: Achieve precise accuracy in the information provided on parking location and availability to build user trust in ParkEase and its reliability.

- **Foster Broad Partnerships**: Collaborate with a wide range of parking providers to ensure ParkEase offers extensive coverage, catering to an array of parking needs in the city.

- **Contribute to Environmental Sustainability**: By reducing the time users spend searching for parking, ParkEase aims to decrease fuel

consumption and carbon emissions, contributing to a healthier urban environment.

3) Scope

- The development of a mobile application tailored for iOS and Android platforms using Flutter and Dart.
- Integration with GPS and real-time databases for tracking and updating parking spot availability.
- Collaborations with local authorities, private parking providers, and sports venues to source parking data.
- The initial launch will focus on a specific city to refine the model and ensure scalability for future expansion to other cities.

4) Methodology

Agile Development Using the Scrum Framework

To ensure the successful development and deployment of our application, we will employ an Agile development methodology, specifically the Scrum framework. Scrum is chosen for its adaptability, emphasis on collaboration, and focus on delivering high-value product features in short iterations. This approach aligns with our objectives of developing a user-friendly mobile application that provides real-time parking information with high accuracy and broad coverage.

Why Scrum?

Scrum is particularly suited to projects where user feedback and changing requirements are expected to significantly shape the product development process. Key aspects of the Scrum framework that benefit our project include:

- **Iterative Development**: Scrum's iterative development cycles, or sprints, allow for constant evaluation and adaptation of the project plan.

This flexibility is crucial for integrating user feedback and refining application features based on real-world use.

- **Defined Roles and Responsibilities**: Scrum defines clear roles (Product Owner, Scrum Master, and Development Team), facilitating efficient decision-making and ensuring a focused approach to achieving project objectives.

- **Regular Communication**: Daily stand-up meetings, sprint planning, sprint review, and sprint retrospective meetings encourage ongoing communication among team members and stakeholders. This ensures alignment with project goals and swift resolution of obstacles.

- **Transparency and Visibility**: Scrum artifacts (product backlog, sprint backlog, and increment) provide transparency about the project's progress and upcoming tasks. This visibility helps manage expectations and supports continuous improvement.

Implementing Scrum for Application Development:

The implementation of Scrum for our parking spot reservation application will proceed as follows:

- **Initial Setup**: Form the Scrum team, including appointing a dedicated Product Owner responsible for liaising with parking spot providers, a Scrum Master to facilitate the Scrum process, and a cross-functional Development Team.

- **Backlog Creation**: Develop a product backlog that lists all features, functionalities, and tasks required to develop the application. This backlog will be prioritized based on value to the user and project objectives.

- **Sprint Planning**: Conduct sprint planning meetings to decide on the set of backlog items to be completed in the upcoming sprint, typically lasting 2-4 weeks.

- **Sprint Execution**: The Development Team works on the tasks defined for the sprint, with daily stand-up meetings to discuss progress and address any impediments.

- **Sprint Review and Retrospective**: At the end of each sprint, conduct a review to demonstrate completed work to stakeholders and a retrospective to identify lessons learned and improvements for the next sprint.

5) Significance

The significance of developing a comprehensive mobile application for parking spot reservation cannot be overstated in the context of modern urban life. As cities continue to grow and the number of vehicles increases, the challenge of finding convenient and affordable parking becomes more acute, affecting millions of drivers daily. This project addresses these challenges head-on, offering a suite of solutions that promise to transform the urban parking experience. Key points of significance include:

- **Enhancing Urban Mobility**: By simplifying the process of finding and reserving parking spots, the application directly contributes to improving urban mobility. Reduced time spent searching for parking eases traffic congestion, thereby decreasing the stress and environmental impact associated with idle vehicles.

- **Economic Benefits**: Providing a reliable and efficient parking solution can significantly benefit local economies. Easier parking encourages more frequent visits to commercial areas, supporting local businesses, and potentially increasing revenue from parking operations.

- **Environmental Impact**: While directly reducing the carbon footprint was not a focal point, the application indirectly contributes to environmental sustainability. By decreasing the time drivers spend searching for parking, the application can help lower overall vehicle emissions, a benefit aligned with broader environmental goals.

- **User Experience and Satisfaction**: At its core, the project aims to deliver a high-quality user experience. The application's user-friendly design, combined with real-time information and the ability to reserve and pay for parking in advance, meets the modern user's expectations for convenience, reliability, and efficiency.

- **Innovation in Urban Infrastructure**: By leveraging technology to address a common urban challenge, the project sets a precedent for innovation in urban infrastructure. It illustrates how digital solutions can enhance the functionality of physical spaces, paving the way for future smart city initiatives.

- **Scalability and Adaptability**: The project is designed with scalability in mind, allowing for expansion into new areas and integration with emerging technologies or services. This adaptability ensures that the application remains relevant and continues to meet the evolving needs of urban drivers.

6) Deliverables

- A fully functional Valet Spot mobile application for both iOS and Android platforms.

- A backend system for real-time parking data management and user support.

- A comprehensive report documenting the development process, user feedback, and performance metrics post-launch.

- A roadmap for future enhancements and potential expansion to additional cities or services.