International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Smart Parking

Mayuri Sant, Shweta Khot, Yashoda Kolape, Aishwarya Chavan, Prof Sadhana J. Chougule

B. Tech, Information Technology, Dr. J. J. Magdum College of Engineering, Jaysingpur

A B S T R A C T

Due to a lack of parking spots, automobile parking has grown to be a significant issue in urban areas. Most metropolitan locations make it extremely difficult and irritating to obtain a parking spot, especially during rush hour. The main goal of the article, "Smart Parking System Using Android Application," is to lessen traffic congestion caused by a lack of parking places on highways, in multistory buildings, and in shopping centres. The suggested application offers a simple method for parking space reservations. The user of this programme can see several parking lots and can also see if there is any space available. He can reserve it for a particular time slot if the booking spot is still open. If there are any empty slots close to the user's location, the paper shows them. Utilising parking spaces effectively is the goal of our initiative. Additionally, this system offers the customer an extra feature. The use of smart parking technologies is required to reduce parking-related issues. This paper provides an overview of parking issues and reviews and discusses the pertinent algorithms, systems, and approaches used in smart parking. An additional feature of this system is the ability to cancel reservations. User may always cancel the area they have reserved. Users can even set the fee online based solely on how long it takes for the reserved space; the amount can be determined, and the user can set the price. This study offers valuable insights into the guidance, monitoring, and reservation aspects of smart parking, as well as future development directions. By offering improved services to end users and lightening the parking administrator's job, a cloud-based smart parking application would enable real-time monitoring and booking of parking availability.

1. Introduction

The rising number of personal vehicles contributes to the challenge of finding parking spaces efficiently, leading to time and fuel wastage during peak hours. The environmental impact of increased traffic and vehicular exhaust emphasizes the need for reservation-based smart parking. Existing parking systems often lack efficiency, user-friendliness, and security. Our Android Application, "Valid Spot," addresses these concerns by facilitating online parking bookings. It helps users locate suitable parking areasmake reservations, and extend them as needed."Valid Spot" integrates geographic and parking data with users' locations and social networks, allowing them to easily find parking spaces. The application focuses on crowdsourcing parking space availability data from users to enhance its functionality. The paper outlines the desired features, requirements for the mobile app, web application, and backend system. It also discusses the data sources powering the initial prototype of the application.

2. Literature Survey-

In the current technological era, where advancements are rapid, a solution addressing the time-consuming and frustrating task of finding legal parking spaces has emerged – "The Smart Parking Application." This application aims to streamline the parking process, preventing cars from being parked illegally on roads.

One notable innovation is the "Parking System Controlled by Android Application," a model designed to regulate and manage available parking slots. It features an efficient circular design and utilizes a rack and pinion mechanism for lifting and placing cars in specific positions. The primary objective is the automation of both parking lots and cars.

The project introduces a scale model of an automated parking system capable of organizing and managing parking based on slot availability. This automated approach employs sensors for parking existing cars, and entry and exit operations are facilitated through an Android application.

3. Methodology

In addressing the prevalent issues of congestion and parking in large cities, an effective solution is the implementation of an Automated Parking System Management using the Internet of Things (IoT). Smart parking, employing information technology and sensors, facilitates users in locating available parking spaces. Key types of smart parking systems include data routing, smart payment, and electronic car parks, all requiring real-time disclosure of parking space availability. Upon user registration, a unique identifier is generated, and booking details, along with entry and exit times, are recorded. Users can calculate charges via their smartphones. The system architecture involves sensing and data transmission at the lowest level, intermediate levels

for processing information, and user interfaces at the upper level. In the agricultural sector, seamless communication between farmers and dealers is crucial for an efficient supply chain. The proposed methodology employs blockchain technology, utilizing a React.js web application and a Solidity smart contract on the Remix IDE. This approach aims to enhance transparency, trust, and direct communication between farmers and dealers.

4. Objectives-

1. Real-time parking space availability:

The application object continuously monitors the occupancy status of parking spaces using various sensors or other data sources. It provides users with up-to-date information on the availability of parking spots in different areas or parking lots.

2. Reservation and payment:

The application object allows users to reserve a parking spot in advance, ensuring availability when they arrive. It may also facilitate the payment process, allowing users to make payments digitally or through integrated payment systems.

3. Navigation and guidance:

The application object can provide navigation and guidance to users, directing them to the nearest available parking spaces or guiding them to their reserved spots. This can be done through GPS integration or through visual indicators within the application.

4. Notifications and alerts:

The application object can send notifications and alerts to users regarding parking availability, reservation confirmations, or time-based reminders (e.g., when their parking reservation is about to expire).

5. Data analysis and reporting:

The application object collects and analyzes data related to parking occupancy, user preferences, and payment patterns. It can generate reports and insights for parking operators or stakeholders, helping them make data-driven decisions for efficient parking management.

6. Integration with other systems:

The application object may integrate with other smart city systems or platforms, such as traffic management systems or mobile payment applications, to provide a seamless user experience and optimize overall parking management within a smart city ecosystem.

5. DFD
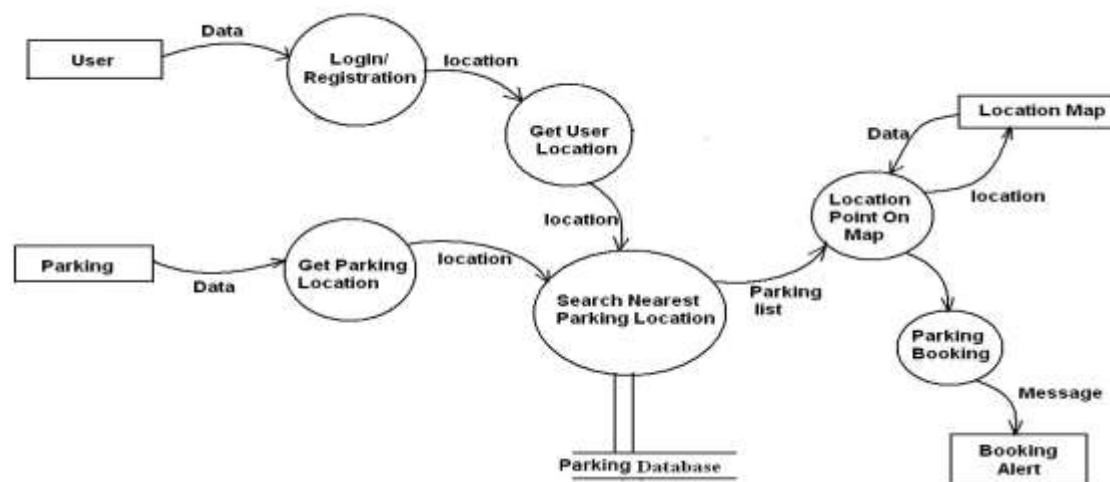
Technologies Used –

Hardware Component

Processor: i3 Processor Onwards RAM: 4GB Onwards

HDD: 50GB minimum onwards

Module components – Arduino uno, ESP8266 wifi nodemcu, Ultasonic sensor and power supply, wires

Software Component

Language – Java, Php, HTML, CSS Database - Mysql

Android Studio

Any Editor For Coding Arduino IDE

6. Future Scope -

The current state of parking information portals in some countries provides users with details about parking areas via the internet. However, these systems lack the ability to distinguish between vacant and occupied parking slots, limiting their smart functionality. While some advanced solutions involve car lifts and automated robotic systems to place cars in specific parking spots upon entry, these technologies may be impractical for medium-scale venues due to high costMany existing systems at public places only indicate overall availability without specifying the exact parking slot or providing a path to the available spot. The future scope involves addressing these limitations by developing smarter systems that not only provide information about parking space availability but also intelligently guide users to the exact vacant slot, enhancing the overall efficiency of the parking experience.

7. Conclusion

this article presents an innovative approach to vehicle parking utilizing contemporary technology. The proposed app empowers users to make informed parking decisions, deviating from the conventional method of physically searching for parking spots. Scaling up the application's usage holds significant advantages, particularly for users navigating unfamiliar locations. The user-friendly and convenient Smart Parking System introduced here has the potential to alleviate traffic congestion, ultimately enhancing citizens' quality of life.The Android mobile application, "Car Parking," offers a practical solution for drivers to locate available parking spaces in a given area and access relevant parking fees. This research marks a valuable contribution to the field, and we extend our gratitude to all collaborators who have contributed to the project. The guidance received from the Dissertation Committee members has been instrumental in shaping both my scientific research skills and broader life perspectives. This work lays the foundation for future advancements in smart parking technology, promising positive impacts on urban mobility and citizen well-being.

References

1) Abdul Ahad, Zishan Raza Khan, Syed Aqeel Ahmad,"Intelligent Parking System" Scientific Research Publishing, Vol.4,No.2, pp. 160-167, May 2016.

2) Dr Y Raghavender Rao," Automatic Smart Parking System using Internet of Things (IOT)" International Journal of Engineering Technology Science and Research,Vol.4,No.5,pp.225-258,May 2017

3) https://ieeexplore.ieee.org/document/9755706

4) https://chat.openai.com/.chat

5) www.GitHub.com