

SMART PARKING SYSTEM BASED ON IOT

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Abstract- Due to rapid urbanization, the number of vehicles on the roads is increasing exponentially, which has led to major parking problems in most urban areas. The current parking system is outdated, inefficient, and time-consuming, causing unnecessary traffic congestion. Hence, there is a growing need for a smarter parking system that can automate parking and reduce traffic congestion. The development of Internet of Things (IoT) technology has opened up new opportunities for smart parking.

Keywords- Smart Parking System, Internet Of Things (Iot), Parking Sensor Technology, Mobile Applications, Traffic Congestion

I. INTRODUCTION

Smart parking systems based on IoT are revolutionizing the parking industry, and they offer new ways to solve the parking problems in urban areas. IoT applications are enabling real-time parking information sharing, smart parking location allocation, and optimized parking rates. This paper presents a comprehensive study of a smart parking system based on IoT that uses sensors, cameras, and mobile applications in parking areas. In this study, we analyze the implementation of the smart parking system and assess its effectiveness.

II. LITERATURE SURVEY

Smart Parking Systems (SPS) based on the Internet of Things (IoT) have gained increasing popularity in recent years due to their ability to provide efficient parking solutions in urban areas. The deployment of these systems involves the integration of sensors, wireless communication, and cloud-based technologies to enable real-time coordination of parking activities.

Rajeena et al. [1] proposed a smart parking system that utilized ultrasonic sensors to detect parking slot occupancy. The collected data was transmitted to a cloud-based server that processed and disseminated parking slot availability information to users via a mobile application, thus minimizing parking search time and reducing traffic congestion.

In a comprehensive review study, dos Santos et al. [2] highlighted the various types of smart parking solutions based on IoT that have been introduced in recent years. These include parking occupancy detection systems, smart parking reservation systems, and smart parking guidance systems, all aimed at improving parking efficiency in smart cities.

Chugh and Bhushan [3] designed and implemented a smart parking system that integrated ultrasonic sensors, an Arduino module, and a cloud-based application to enable real-time monitoring of parking slot occupancy and reservation of available slots. The proposed system relied on crowdsourced data to provide efficient and scalable parking solutions for smart cities.

Sridharan et al. [4] proposed a smart parking system that utilized IoT technologies to enable real-time monitoring and analysis of parking slot occupancy. An integrated system of

sensors, wireless communication, and a cloud-based platform was used to collect, process, and disseminate parking data to users, thus improving parking efficiency and reducing the associated parking-related issues.

Girgis and Hammouda [5] designed a smart parking reservation system that relied on IoT technologies to enable reservation of parking slots in advance. The system was designed to gather real-time information on parking slot occupancy and availability and used this data to enable efficient reservation and utilization of parking spaces.

Overall, the reviewed studies demonstrate the potential of smart parking systems based on IoT to provide efficient and scalable parking solutions for smart cities. These systems rely on the integration of sensors, wireless communication, and cloud-based technologies to enable real-time coordination of parking activities. The proposed systems have the potential to minimize traffic congestion, reduce carbon emissions, and improve the quality of life in urban environments.

III. PROBLEM STATEMENT

Finding a parking spot in busy urban areas can be a challenging task for drivers. Traditional parking systems often rely on human-operated parking meters or paper-based parking permits, which can lead to inefficiencies and errors in parking management. Additionally, drivers often spend a significant amount of time searching for a parking spot, resulting in congestion and increased carbon emissions. Therefore, there is a need for a smarter and more efficient parking system that can address these issues and provide a better parking experience for drivers. A smart parking system that uses technology such as sensors, cameras, and mobile applications can help in providing real-time information on parking availability, streamlining parking payments, and reducing traffic congestion. The problem statement, therefore, is to design and develop a smart parking system that can efficiently manage parking spaces, reduce parking-related hassles for drivers, and improve the overall parking experience in urban areas.

IV. PROPOSED SOLUTION

A smart parking system can be developed using sensor-based parking availability and a mobile application to provide real-time information on parking availability and streamline parking payments. The system can also use cameras and license plate recognition technology to enforce parking regulations and reduce fraudulent parking activities. By implementing such a system, the overall parking experience in urban areas can be improved, traffic congestion can be reduced, and carbon emissions can be minimized.

V. EXPERIMENTAL RESULT

Finding a parking spot in busy urban areas can be a challenging task for drivers. Traditional parking systems often rely on human-operated parking meters or paper-based parking permits, which can lead to inefficiencies and errors in parking management. Additionally, drivers often spend a

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VI. CONCLUSION

The smart parking system based on IoT has proved to be an effective solution to the parking problem in urban areas. The system offers real-time parking information, which enables users to find available parking spots quickly, thus reducing traffic congestion. The use of parking sensor technology, cameras, and mobile applications is allowing parking data to be processed and analyzed effectively. With the integration of IoT technology, the smart parking system has the potential to optimize parking rates and improve user experience. In conclusion, smart parking systems based on IoT are a game-changer for the parking industry and are set to play a prominent role in the smart city solution.

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VIII. REFERENCES

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