SMART VEHICLES PARKING WITH ADVANCED BOOKING SYSTEM USING IOT

Harsh Kumar Sharma[1], Shubham Dewangan[2], Nishant Yadav[3], Tushar Magar[4], Nikhil Sahu[5]

[1, 2, 3, 4, 5] UG Scholars, Department of Electrical Engineering, Shri Shankaracharya Technical Campus,
Bhilai, Chhattisgarh, India

Abstract - The project "smart vehicles parking with advanced booking system using IOT" aims to develop a smart parking system that allows users to book parking spaces in advance using their smartphones. The system uses IOT devices such as sensors and embedded systems to detect parking availability and provide real-time data to the cloud. The advanced booking system provides users with the ability to reserve parking spaces, making the parking experience more efficient and convenient. However, developing such a system comes with several challenges, including technical complexities, infrastructure availability, user acceptance, cost, integration with existing systems, and data security. Overcoming these challenges requires a systematic and comprehensive approach, including proper planning, stakeholder engagement, and risk management strategies. The successful implementation of the "smart vehicles parking with advanced booking system using IoT" can improve the parking experience for users and enhance the efficiency of the parking management system. This project has the potential to benefit the transportation sector and provide a blueprint for developing smart parking systems in other urban areas.

Index Terms - Smart Vehicle parking management system, Advance booking system, Parking slot availability checker, Internet of Things (IOT), Sensor-based parking.

I. INTRODUCTION

Smart vehicle parking with advanced booking is a technology-driven solution that revolutionizes the parking experience for drivers. It combines sensors, cameras, and real-time data analysis to provide a seamless and convenient parking solution that saves time and reduces stress. Drivers can access parking information through an online platform or mobile application and reserve a parking spot in advance. The system offers features such as automated payment and real-time updates on parking availability and traffic conditions. This system can help to reduce congestion, improve traffic flow, and reduce greenhouse gas emissions while providing a more convenient and efficient parking solution for customers.

1) Objectives

The SMART VEHICLES PARKING WITH ADVANCED BOOKING SYSTEM USING IOT project is a revolutionary initiative that aims to revolutionize the way drivers park their vehicles. By harnessing the potential of IOT technology, the system enables seamless parking management, optimized space utilization, and real-time updates on parking availability, all while reducing the carbon footprint of vehicles. The advanced booking system allows drivers to save time and reduce the frustration associated with finding a parking spot. Overall, the project is a crucial step towards creating a sustainable and efficient transportation system, reducing traffic congestion, and promoting a greener environment.

2) Problem Statement

The SMART VEHICLES PARKING WITH ADVANCED BOOKING SYSTEM USING IOT project aims to address the issues and challenges associated with traditional parking systems. These challenges include the time and effort required to locate an available parking space, the inconvenience of queuing for payment, and the potential for fines or other issues related to parking fees. These problems lead to increased traffic congestion, decreased efficiency, and negative impacts on the environment. By utilizing IoT technology and an advanced booking system, this project aims to create a smart parking system that streamlines the parking experience for drivers, reduces traffic congestion, and promotes a more sustainable and efficient transport system.

3) Proposed Solution

The proposed solution to the problem statement of SMART VEHICLES PARKING WITH ADVANCED BOOKING SYSTEM USING IOT is to develop a smart parking system that utilizes IoT technology and an advanced booking system. The system will utilize sensors and cameras to detect the presence of vehicles, update an online platform or mobile application for drivers, and allow for automated payment processing. This system aims to streamline the parking experience, reduce traffic congestion, and promote a more sustainable and efficient transport system.

II. LITERATURE SURVEY

Smart parking systems with an advance booking system have gained popularity in recent years due to their ability to optimize parking spaces and reduce traffic congestion. The literature review on smart vehicle parking with an advance booking system reveals the following findings:

Lee et al. (2019) proposed a smart parking system with an advance booking system based on the Internet of Things (IoT) technology. The system uses ultrasonic sensors to detect parking space availability and a mobile application to allow users to reserve parking spaces in advance. The system also provides real-time updates on parking availability and helps reduce traffic congestion.(1)

Lu et al. (2018) developed a smart parking system with an advance booking system based on cloud computing and mobile technology. The system uses cameras and sensors to detect parking space availability and provides real-time updates to users through a mobile application. The system also includes a reservation system that allows users to book parking spaces in advance, reducing the time spent searching for parking spaces.(2)

Chen et al. (2020) developed a smart parking system with an advance booking system based on a wireless sensor network. The system uses sensors to detect parking space availability and a mobile application to allow users to reserve parking spaces in advance. The system also includes a pricing mechanism that adjusts parking fees based on demand, encouraging users to park in less busy areas.(3)

Overall, the literature review reveals that smart vehicle parking with an advance booking system can improve parking efficiency and reduce traffic congestion. The use of IOT, cloud computing and machine learning algorithms can help predict parking space availability and reduce the time spent searching for parking spaces. The use of mobile applications also provides a convenient way for users to reserve parking spaces in advance.
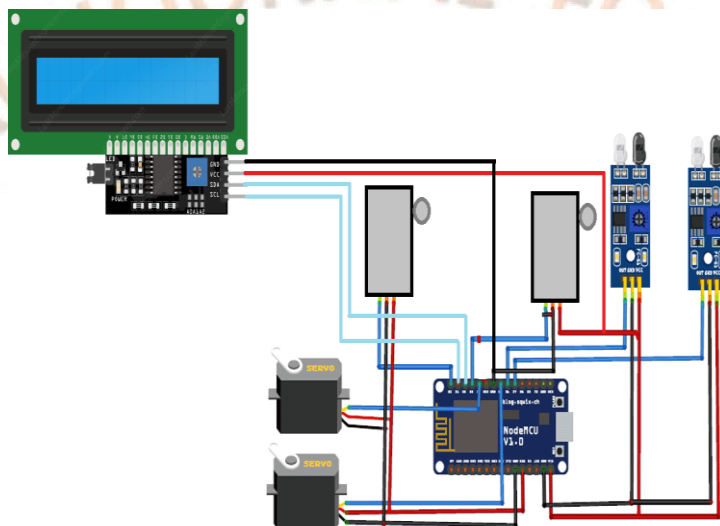
III. CIRCUIT DIAGRAM

Fig.1 Circuit Diagram

The circuit diagram for Smart Vehicles Parking with Advanced Booking System using IOT would consist of sensors, microcontrollers, communication modules, and power sources to detect and manage parking availability, allow advanced bookings, and control access to parking areas via RFID or other security measures, providing a convenient parking experience for users.
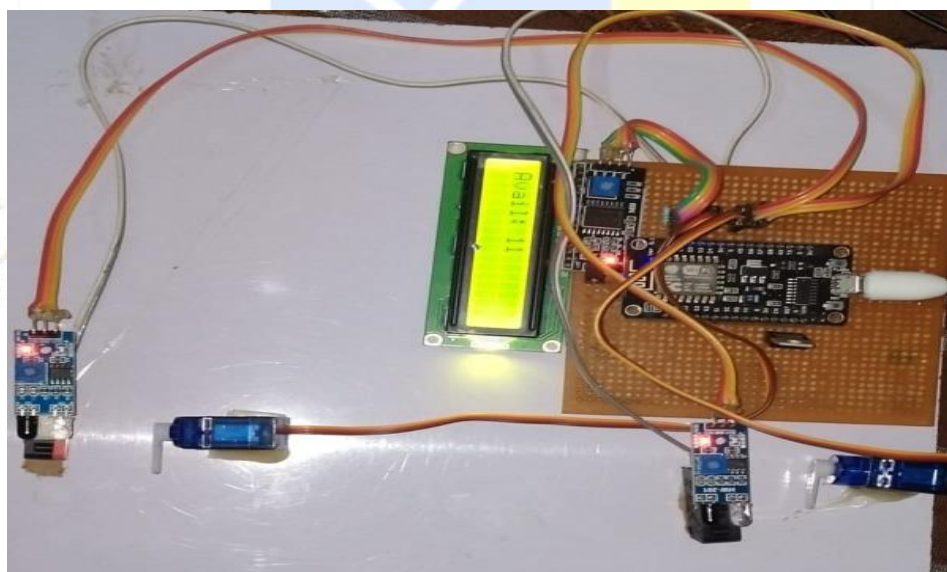
IV. HARDWARE MODEL

Fig.1 Hardware model

V. WORKING PRINCIPLE

The working principle of Smart Vehicles Parking with Advanced Booking System using IOT involves the use of sensors to detect the availability of parking spaces and transmit this data to a central control unit. The control unit manages the allocation of parking spaces based on real-time data and advanced bookings made by users through a mobile app or web portal.

Access to the parking area is controlled by microcontrollers using RFID or other security measures. Communication modules transmit data between the sensors, control unit, and user devices. Power sources such as batteries or solar panels power the sensors and communication modules, with backup power sources to ensure continuous operation.

Overall, the system aims to provide a seamless and convenient parking experience for users by utilizing IOT technology to optimize parking space utilization and enable advanced bookings.
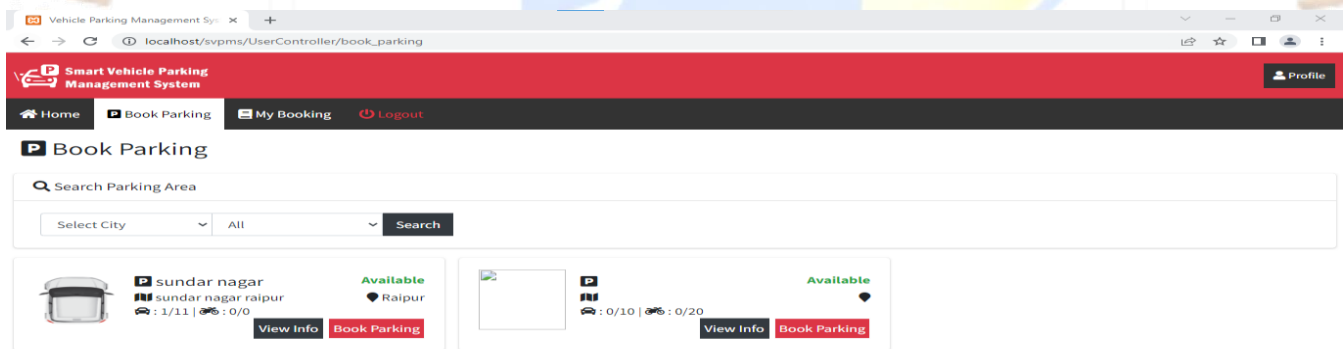
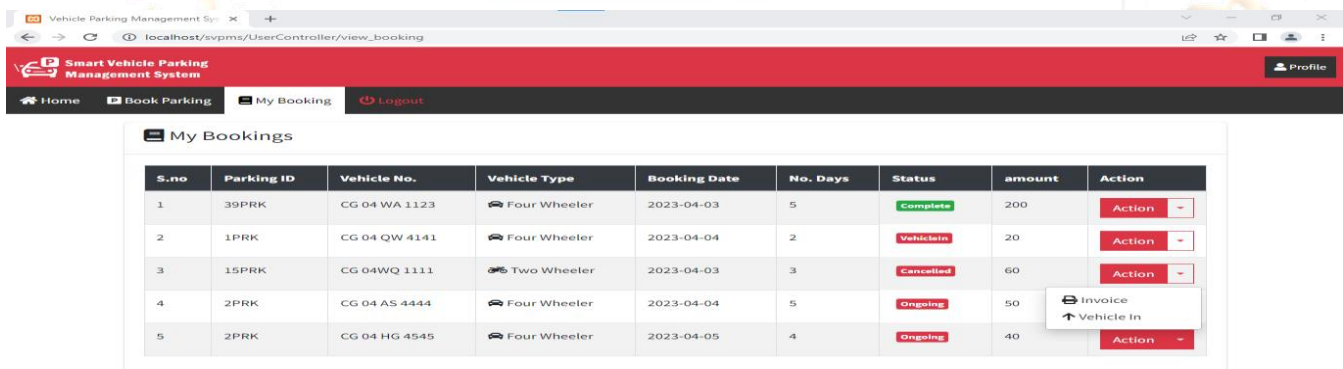## VI. MODE OF OPERATION

We now understand how the model works
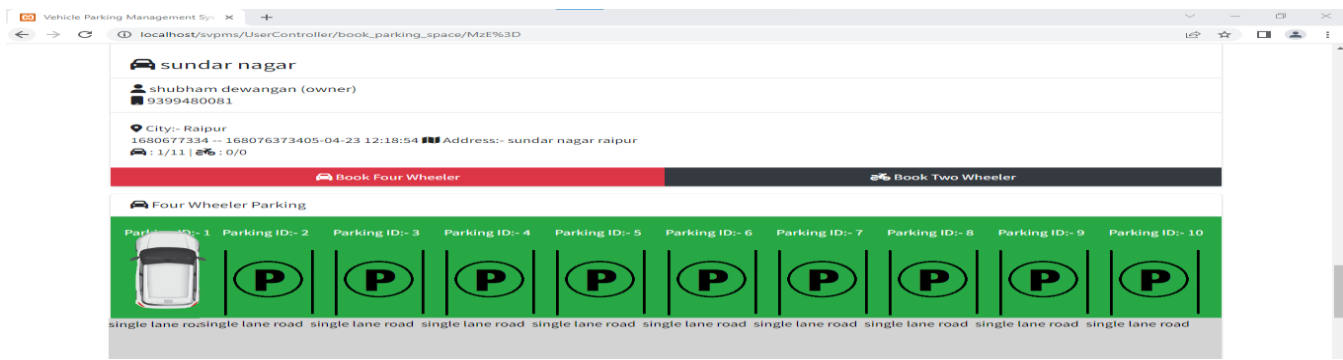Firstly go to the "SMART VEHICLE PARKING MANAGEMENT SYSTEM" website.
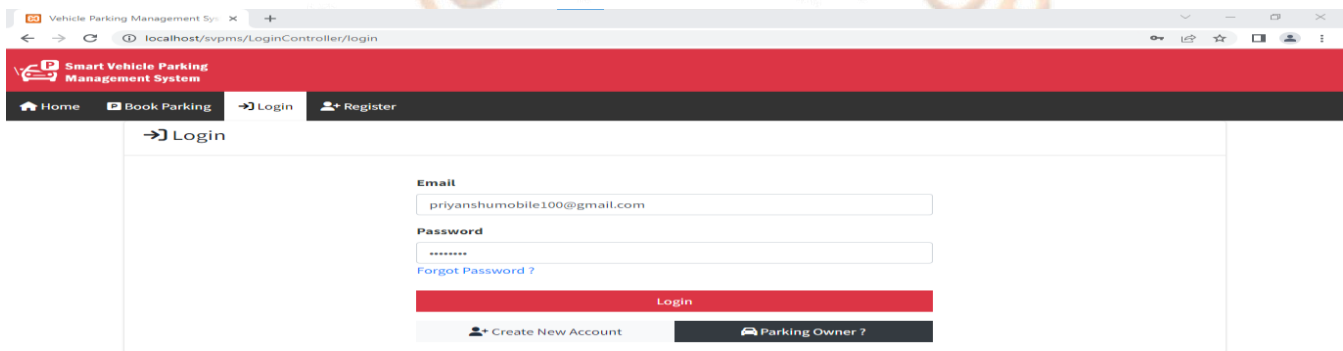
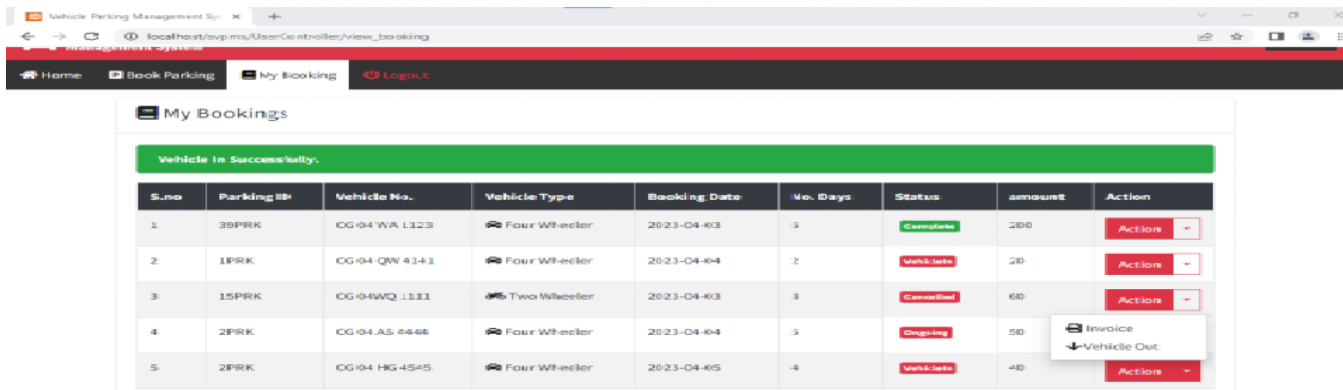**STEP 1: Click the login and enter the Email and Password**

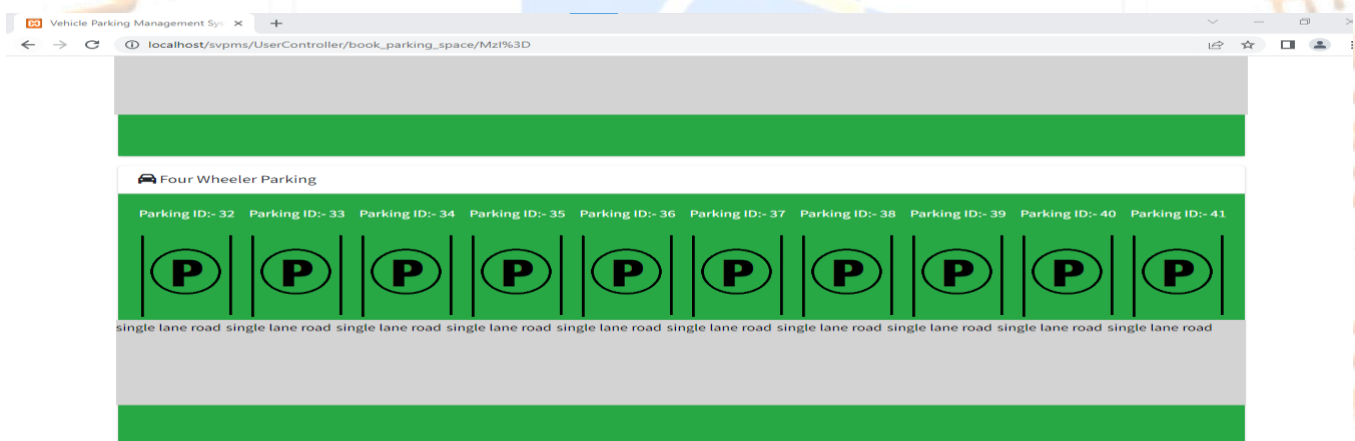**STEP 2: Next select the booking place those are available in your area**

STEP 3: User booked the parking slot and car gets in.

STEP 4: User select the parking place and parking area are showing the vehicle in.

STEP 5: User leave the parking slot and car gets out.

STEP 6: parking slots are empty and not showing the car.

VII. CONCLUSIONS

The concepts of smart cities have always been a dream. Advancements in internet of things and cloud technologies have made the dream of smart cities a reality. This report focuses on an advanced parking system utilizing sensors and the latest technologies as a subset of smart city development. Smart parking facilities are crucial for constructing smart cities as they provide real-time information on parking slots and help resolve traffic congestion. The report outlines the project's aims, objectives, methods, and future work, including plans for GPS, reservation facilities, and license plate scanners. The goal of this research is to improve the lifestyle of car owners by saving time and improving parking availability around areas such as malls, schools, and other locations.

IX. REFERENCES

[1] Shruthi Mudaliar, Shreya Agali, Sujay Mudhol, Chaitanya K Jambotkar "IOT Based Smart Car Parking System" IJSART - Volume 5 Issue 1 –JANUARY 2019

[2] Baratam, M Kumar Gandhi* and M. Kameswara Rao described "A Prototype for IOT based Car Parking Management System for Smart Cities" Indian Journal of Science and Technology, Vol 9(17) May 2016

[3] R. Yusnita, FarizaNorbaya, and Norazwinawati Basharuddin- has proposed "Intelligent Parking Space Detection System Based on Image Processing" International Journal of Innovation, Management and Technology, Vol. 3, No. 3, June 2012

[4] K.Ashokkumar a, Baron Sam, R.Arshadprabhu, Britto. "Cloud Based Intelligent Transport System". Procedia Computer Science

2015

[5] Abdul Ahad, Zishan Raza Khan, Syed Aqeel Ahmad,"Intelligent Parking System" Scientific Research Publishing. World Journal of Engineering and Technology > Vol.4 No.2, May 2016

[6] Dr Y Raghavender Rao," Automatic Smart Parking System using Internet of Things(IOT)" International Journal of Engineering Technology Science and
Research, May 2017

[7] Asian Journal of Convergence in Technology, Vol.4,No.1,May 2017Benson, J.P.T. O'Donovan, P. O'Sullivan, U. Roedig and C. Sreenan et al.,"Car park managementusing wireless sensor networks", Proceedings of the 31st Conference on Local Computer Networks, Tampa, FL., USA., November 2006.

[8]   M.A.R. Sarkar, A.A. Rokoni, M.O. Reza, M.F. Ismail, "Smart Parking system with image processing facility", I.J. Intelligent Systems and Applications, 2012

[9] Vishal Dineshkumar Soni "IOT BASED PARKING LOT" International Engineering Journal For Research & Development Vol.3 Issue 1 2018

[10] Venkanna, U., Sharma, S., Katiyar, B. and Prashanth, Y., 2018, February. "A wireless sensor node based efficient parking slot availability detection system for smart cities". In 2018 Recent Advances on Engineering,Technology and Computational Sciences (RAETCS) (pp. 1-6).IEEE.