

## **Parking Lot Management System**

D. Gayathri<sup>1</sup>, Sree Anjani Kumar<sup>2</sup>, Praveen Kumar<sup>3</sup>

<sup>1</sup>Assistant Professor, Dept of CSE, Sri Chandrasekarendra Saraswathi Viswa Maha Vidyalaya

<sup>2</sup> Dept of CSE, Sri Chandrasekarendra Saraswathi Viswa Maha Vidyalaya

<sup>3</sup>Dept of CSE, Sri Chandrasekarendra Saraswathi Viswa Maha Vidyalaya

### **Abstract**

As the name suggests that, this project is about Parking Management. With growing, car parking increments with the number of vehicle users. With the increase of smart phones, internet, users prefer web based application or smart phone applications for these solutions. The number of vehicles in cities has incremented dramatically due to rapid economic development. However, the infrastructure for accommodating these vehicles has grown relatively slow. Incrementation of the pressure on the urban transport system and solving the 'parking difficulty' problem have thus become hot topics recently. In this project, an intelligent parking system based on field variations is presented to solve this problem. An algorithm which release the pressure on parking traffic in a parking lot is designed and field test results are presented. Our outputs show that this system has an more accuracy with low cost, high feasibility, high efficiency and hence is recommended for wide use.

The valid scope of this project is to reduce the traffic in the parking place. As we can see in the various places like malls, industries, and public areas there is problem they have to go and search which line is empty and which line having place to park the vehicle, for parking then they need people for parking in correct parking position it is the money decrement process. So to avoid this problem Parking Lot Management System project is implemented.

**Keywords:** Web Design, CSS, HTML, JavaScript, Adding Details, Storing Details.

### **1. Introduction**

A parking lot management system is used for managing the parking spaces for vehicles in parking lots. A parking management system is the one that allows easier management of vehicles in parking lots. But since then, the number of vehicle owners has incremented.

There are mainly two roles involved in the scene: the visitor, who is driving the vehicle and the parking official, who manages the parking lot.

Thus, an parking lot management system makes the job of both the vehicle parkers and the parking management officials easier.

This Project proposes the Smart Parking Lot Management System based on Web Development.

Goals of parking lot management system include:

1. Name of the person and Car
2. Noting the License Plate
3. Entry Date and Time of the Vehicle
4. Exit Date and Time of the Vehicle
5. List of Cars in Parking Lot

#### **1.1 Objectives**

- a) To develop an intelligent, user friendly automated car parking system which reduces the manpower and traffic congestion.
- b) To offer safe and secure parking slots within limited area.

## 2. Literature Review

There exist various practices in the global smart parking scene. The intelligent parking architectures that are discussed in this section present the universal sleek parking case carried out in Barcelona, Bussan Riga, Santander, and Valletta. The overview shows the various communication technologies specific to certain smart parking while spotting the major aspects that influence intelligent parking performance.

Barcelona, a Smart City, has achieved a wide range of the merits through investments in IoT for urban systems, including smart parking technology. Sotres et al. explain how city has invested in deploying system for motorists to guide them to technical-parking spots. A 600 of wireless parking sensors were set on the streets of Barcelona, les Cortes district, in 2014. The aspects were placed below the asphalt, and the sensors were then used to find the available parking spaces and notify the motorists. The program was informed to chop down on emissions and congestion by providing motorists real-time directions on the availability and location place. of open parking spaces. Access to sensor data was conducted through the proprietary application programming interface (API) of varying technology vendors operating in the smart parking space.

Another case scenario is Busan city, South Korea, where IoT technology was utilized as part of the first-generation IoT-enabled smart city pilot project. The proposed intelligent parking services were enhanced annually between 2015 and 2017. In the first year (2015), the parking sensors were fixed to public parking lots to provide real-time parking service data. In the following year, closed-circuit television (CCTV)-based image recognition technology was implemented to gain better insights into the occupancy data. Finally, in the final year (2017), parking spaces with electronic vehicle charging stations were incorporated. Six indoor ones were selected to be part of the smart parking use in the wise lot project for 2014 intelligent parking sensors. They provide real-time occupancy data in every parking location. The universal grading is proposed by the wise-IoT framework for the platform's interoperability.

Another case is that of Riga city, which has paid parking services. The city has an underground parking space for around 167 vehicles, which are managed through an installed, automated parking ticketing machine located at the parking's entrance and exit, where drivers acquire a ticket with a QR code with time stamps. The success of this system is such that the vehicle that exceeds the parking time limit will not be capable of parking without being surcharged with additional parking time.

The city of Santander in Spain also experimented on the implementation of a smart parking solution, with parking lots with built-in inductive sensors. Here, over 250 outdoor parking sensors were installed in the city's primary parking centers to detect the availability of parking spaces. The advantage of these sensors is that they are buried under asphalt, and they work based on ferromagnetic detection. An API was created for the utilization in the exchange of information through the sensors and the client, where data that are collected from the devices therein are then dissipated to the manufacturers back in real time, and they are finally processed and relayed back in the form of free occupied events. per parking spot. Interestingly, this framework is also utilized in the municipality for traffic management tasks and the control of traffic lights.

In the city of Pisa in Italy, extensive tests for innovative parking solutions have been conducted, and their results have been analyzed. The analysis covered mainly long-/medium-term parking lots mostly used by commuters and was also focused on the different typologies of parking spaces existing, e.g., regular, disabled-reserved, and e-vehicle-reserved. This analysis was performed using autonomous systems based on wireless smart cameras, which locally acquire and analyze images while only. gating numeric results toward the centralized server. The objectives were different: having an autonomous intelligent system using energy harvesting through photovoltaic panels; providing a Web platform and mobile applications; and evaluating and validating the propa design while considering integration with the existing traffic management system. These applications primary purpose is to integrate collected data from the developed wireless sensors and to transmit the aggregated results to a higher hierarchical level.

Another city that offers a practical observation on how the smart parking systems work is the city Valletta, which offers an interesting scenario, as it is walled and has a limited parking infrastructure. Therefore, the accessibility to the city by any vehicle is at the limit of road pricing, amount of pedestrians, and the relativity of parking spaces. The parking system here was introduced to provide real-time parking information and the management of the supply of parking spaces according to the users' demand. However, with the increasing number of vehicles in the city, there is a proposal to introduce a new (smart) parking management system that may help to overcome escalating vehicular challenges. In line with this, there is a plan to install around sixty sensors and a number of cameras as a way of

testing and piloting various technologies prior to identifying the most appropriate method for the future upscaling of the city.

### 3. Proposed Methodology

This proposed Smart parking system consists of the deployed web development module which delivers real-time output and monitors the flow of the parking of vehicles in and out of that particular parking lot. The methodology provides the optimal solution for the parking space.

System needs to store information about new Car Entry.

System needs to update and delete the record.

System also needs a search area.

System needs to keep the record of the Parking vehicles.

System needs to provide the information to the management staff.

Creating the Parking Lot Management System web application using:

1. HTML
2. CSS
3. React JS
4. Bootstrap
5. SQL
6. Php
7. Flutter

Car Management Module - used for managing the car details.

Car Number Module - used for managing the details of car number.

Parking Management Module - used for managing the information and details of the parking.

#### 3.1 Creative Mechanism Design Methodology

Creating a HTML file include adding details of the name of the person and car details.

Style the HTML page with CSS.

Add some JavaScript and Bootstrap touches and run till the front end.

Collect the required data like name of the person, license plate, register details, entry date, exit date, number of vehicles in parking lot.

Deploy the data in the database.

Use SQL to store and function the database management.

#### Data Flow

Database specialists will store data of people who all are users of web application. Specialists will store vehicle holder's details for security, name, address, license plate, entry and exit date(front and back). Skills required are mongo db. It is our responsibility to guide customers with proper rules and regulations in order to avoid any misleads and malpractices.

Algorithm - All the above information will be stored in a database securely. List of vehicles and actions will be stored and shown to the user. Collect the required data like name of the person, license plate, register details, entry date, exit date, number of vehicles in parking lot. Deploy the data in the database. Use SQL to store and function the database management.

#### Experimental Analysis

One can implement the parking lot management system using this web application that's been designed. Customers vehicles can be stored in the designed web application using with active internet connection. Every good have its worth, Customers vehicles will be safe and secured throughout by entering parking lot. Customers are requested to give details to the device operator.

Parking Lot

**Add Car to Parking Lot**

Name :

Car :

License Plate :

Entry Date :

Exit Date :

**List of Cars in Parking Lot**

Name	Car	License Plate	Entry Date	Exit Date	Actions
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Fig 1. Home page

List of Cars in Parking Lot

Name	Car	License Plate	Entry Date	Exit Date	Actions
Praveen Kumar	Xylo	CH-02-2008	2021-10-12	2021-10-12	<input type="button" value="X"/>
Anjan	Duster	CH-01-AH-4444	2021-10-22	2021-10-30	<input type="button" value="X"/>

Fig 2. List of vehicles

### Conclusions

Our exclusive parking lot management project is designed to resolve the day to day parking management issues. This system is meant for commuter toward an available parking slot. Displays the number of vehicles in the parking lot. That is our only intention to create this website.

### Future Enhancement

The parking industry is expected to grow as a smart and green industry with the commoditization of new technologies. With the arrival of new ecosystem players and participants, it is anticipated that the early positive disruption of this market. At that time it will be more useful for these type of technology.

### References

Research shows that cars remain parked for 95% of their lifetime. Suggesting that parking lot management systems should be smart, efficient. There are apps that help users find parking spaces. This is especially useful for people in big cities. From this we will give real-time parking availability system.

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