



International Journal of Innovative Research in Science Engineering and Technology (IJIRSET)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)



Impact Factor: 8.699

Volume 14, Issue 4, April 2025

Digital Platform for Advanced Parking Spot Booking and Management

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ABSTRACT: The proposed project is a smart parking reservation system that offers clients an easy way to reserve a parking space online. It overcomes the problem of Finding a parking area in industrial or commercial areas that is useful consumes time. As a result, this challenge provides an internet-based reservation machine where customers can view numerous parking regions and select the space to view whether an area is to be had or not. If the reserved space is available, he can book it for a specific time slot. The booked area might be marked yellow and could no longer be available for all of us for the specified time. This gadget affords the additional characteristic of cancelling the bookings. Each time, the user can cancel their books area. Users can make payment online via Credit card, UPI, etc. Users are notified approximately after making the payment, the booking via email along with a particular parking number. Online Vehicle Leaving Framework, as portrayed above, can prompt mistake free, secure, solid and quick administration framework.

I. INTRODUCTION

People's Parking had challenges concerning the safety of its data in the store since they Currently, a paper-based system is used, resulting in physical struggles for parking by drivers, as well as time waste. Congestion and collisions. There was also a problem with monitoring the profit made by the company. Whereby the company lost money to the workers who received it (fraud). This system majorly solved the congestion, avoided collisions, and saved time during parking activities. Parking is extremely important all over the world, particularly in major cities. Every day, thousands of car drivers spend numerous amounts of time locating where to park. The end result of this case involves theft in urban areas, growing visitor congestion, and the frustration of drivers. In order to resolve this hassle, the implementation of an online vehicle park reservation system in this metropolis Coping with parking locations is obligatory. It will allow drivers to reserve a parking space on the Platform whenever, anywhere. It is intended to make online parking space reservations simpler for users. In today's parking lots The process of looking for parking spots is not standardised. Most people's everyday concern and time-consuming in a big city is finding a parking spot that is free. The search for a parking spot frequently leads to increased traffic and air pollution in a particular location.

Problem Statement:

One of the biggest problem that the driver faces is finding a free parking spot, so many driver stopping their cars at the edges of the street. Therefore, we choose this project to prevent the frustration of finding a parking spot, and they can reserve a spot online. The project we are working on is a smart parking booking system that provides customers an easy way of reserving a parking space online. It overcomes the problem of finding a parking space in commercial areas like malls offices which unnecessary consumes time. Hence this project offers a web-based reservation system where users can view various parking areas and select the area whether space is available or not. If the booking space is available, then he or she can book it for specific time slot. The booked space will be marked and will not be available for anyone else for the selected time by user. This system provides an additional feature of cancelling the booking. User can cancel their booked space anytime. After making payment users are notified about the booking by email along with unique parking number. In this way it will help association in better usage of assets.

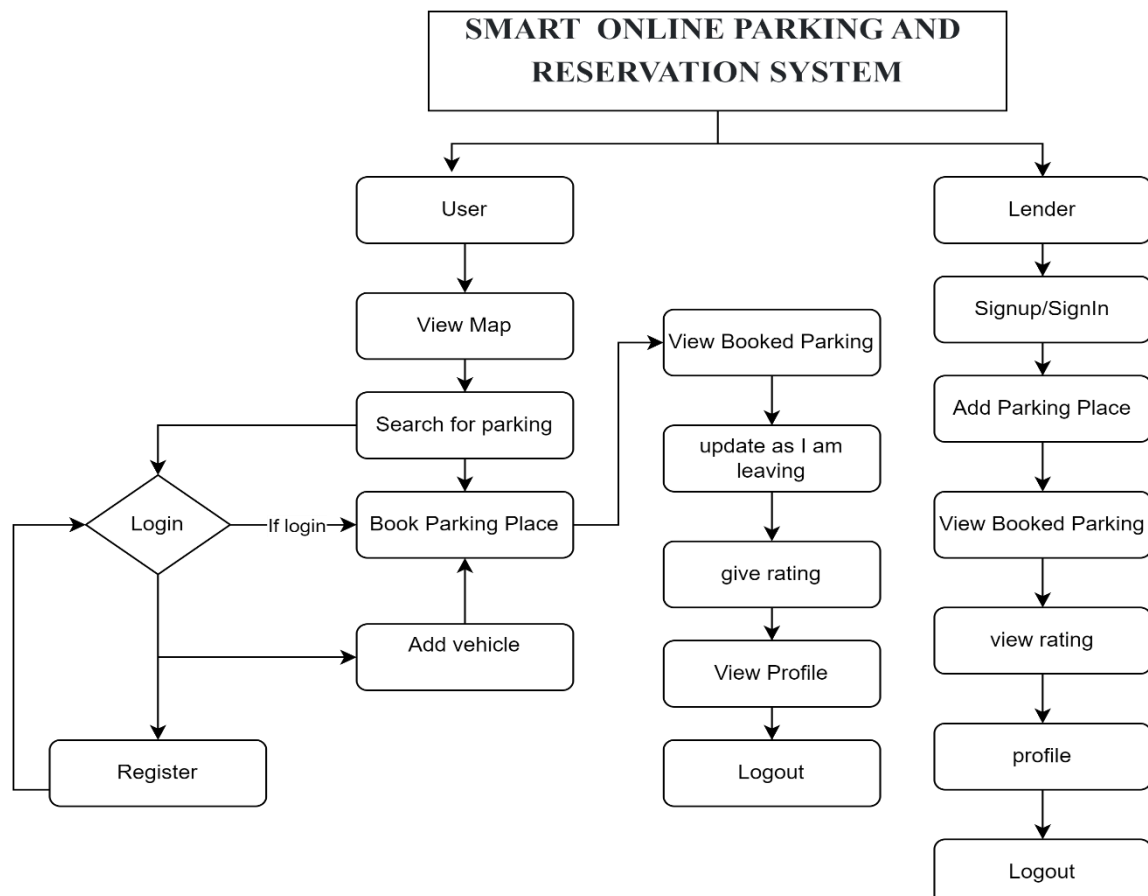
Objective of the Project:

The main objective of the project on online parking booking system is to manage the details of car, car number parking, parking space, parking slots, parking fees. The only person with access to the project is the administrator because it has been entirely constructed there. The project's goal is to create an application software that will cut down on manual management of cars, parking spaces, car numbers, and parking spots. It keeps track of every detail pertaining to parking spaces, slots, and fees..

Scope:

These facilities are absent from some parking lots, which makes them ineligible for parking and violates all security regulations. By looking such a huge concern, it is highly required that each parking area should be well equipped with high tech parking control systems, that nevertheless lasts the best. These characteristics are therefore crucial nowadays to protect your vehicles and to assess the cost associated with each vehicle's entry and exit. This also helps with the Security and time management of the parking. Because of the increased transmission of information via technology, PPK is now easier to trade. From manual and neighborhood vehicle parking reservation systems to computerized and online. The Vehicle Parking Reservation System was used to manage, register, and pay for parking spaces booking simpler. The research has helped reduce paperwork and errors in the reservation workplace like misspelling the quantity plate, vehicle version, time wastage, delays, and congestion at the reservation workplace. The examine became also useful to the researcher in the manner that it helped him in setting the received information in computer science with a sensible attitude. This study shall additionally be useful to the government in getting applicable records and make policies for such organizations and encourage others to do the same.

II. ARCHITECTURE



III. FEASIBILITY STUDY

The feasibility of the project is analysed in this phase and business proposal is put forth with a very general plan for the project and some cost estimates. During system analysis the feasibility study of the proposed system is to be carried out. This is to ensure that the proposed system is not a burden to the company. For feasibility analysis, some understanding of the major requirements for the system is essential.

Three key considerations involved in the feasibility analysis are

- ◆ ECONOMICAL FEASIBILITY
- ◆ TECHNICAL FEASIBILITY
- ◆ SOCIAL FEASIBILITY

Economic feasibility:

This study is carried out to check the economic impact that the system will have on the organization. The amount of fund that the company can pour into the research and development of the system is limited. The expenditures must be justified. Thus, the developed system as well within the budget and this was achieved because most of the technologies used are freely available. Only the customized products had to be purchased.

Technical feasibility:

This study is carried out to check the technical feasibility, that is, the technical requirements of the system. Any system developed must not have a high demand on the available technical resources. This will lead to high demands on the available technical resources. This will lead to high demands being placed on the client. The developed system must have a modest requirement, as only minimal or null changes are required for implementing this system.

Social feasibility:

The aspect of study is to check the level of acceptance of the system by the user. This includes the process of training the user to use the system efficiently. The user must not feel threatened by the system, instead must accept it as a necessity. The level of acceptance by the users solely depends on the methods that are employed to educate the user about the system and to make him familiar with it. His level of confidence must be raised so that he is also able to make some constructive criticism, which is welcomed, as he is the final user of the system.

IV. METHODOLOGY

One of the biggest problem that the driver faces is finding a free parking spot, so many driver stopping their cars at the edges of the street. Therefore, we choose this project to prevent the frustration of finding a parking spot, and they can reserve a spot online. The project we are working on is a smart parking booking system that provides customers an easy way of reserving a parking space online. It overcomes the problem of finding a parking space in commercial areas like malls offices which unnecessary consumes time. Hence this project offers a web-based reservation system where users can view various parking areas and select the area whether space is available or not. If the booking space is available, then he or she can book it for specific time slot.



V. SYSTEM DESIGN**Input Design:**

In an information system, input is the raw data that is processed to produce output. During the input design, the developers must consider the input devices such as PC, MICR, OMR, etc.

Therefore, the quality of system input determines the quality of system output. Well-designed input forms and screens have following properties –

- It should serve specific purpose effectively such as storing, recording, and retrieving the information.
- It ensures proper completion with accuracy.
- It should be easy to fill and straightforward.
- It should focus on user's attention, consistency, and simplicity.
- All these objectives are obtained using the knowledge of basic design principles regarding –
 - What are the inputs needed for the system?
 - How end users respond to different elements of forms and screens.

Objectives for Input Design:

The objectives of input design are –

- To design data entry and input procedures
- To reduce input volume
- To design source documents for data capture or devise other data capture methods
- To design input data records, data entry screens, user interface screens, etc.
- To use validation checks and develop effective input controls.

Output Design:

The design of output is the most important task of any system. During output design, developers identify the type of outputs needed, and consider the necessary output controls and prototype report layouts.

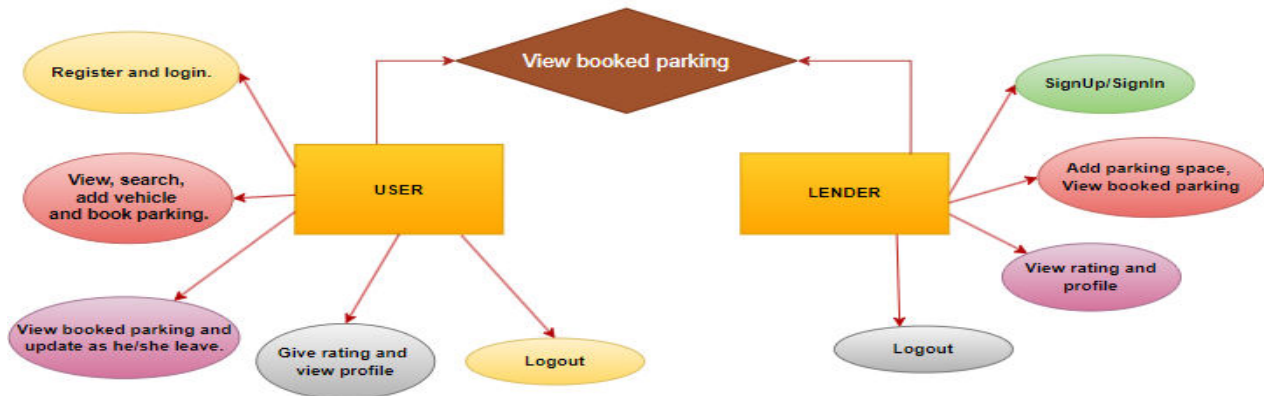
Objectives of Output Design:

The objectives of input design are:

- To develop output design that serves the intended purpose and eliminates the production of unwanted output.
- To develop the output design that meets the end user's requirements.
- To deliver the appropriate quantity of output.
- To form the output in appropriate format and direct it to the right person.

ER DIAGRAM:

- An Entity-relationship model (ER model) describes the structure of a database with the help of a diagram, which is known as Entity Relationship Diagram (ER Diagram). An ER model is a design or blueprint of a database that can later be implemented as a database. The main components of ER model are: entity set and relationship set.
- An ER diagram shows the relationship among entity sets. An entity set is a group of similar entities and these entities can have attributes. In terms of DBMS, an entity is a table or attribute of a table in database, so by showing relationship among tables and their attributes, ER diagram shows the complete logical structure of a database. Let's have a look at a simple ER diagram to understand this concept.



TEST CASES:

Module	Test Case Description	Preconditions	Test Steps	Expected Result
User Registration	Verify if a user can successfully register with valid details	User has not registered before	1. Navigate to the registration page. 2. Enter valid details. 3. Submit the form.	The system should create the account and display a success message.
Login	Verify if a registered user can log in with valid credentials	User has registered successfully	1. Go to the login page. 2. Enter valid username and password. 3. Submit.	The user should be redirected to the homepage, and a session should be created.
Search Parking Spaces	Verify if users can search for available parking spaces in a specific area	User has logged in successfully	1. Navigate to the search page. 2. Enter search criteria. 3. Submit the search.	The system should display a list of available parking spaces matching the criteria, with map integration.
Book Parking Spot	Verify if a user can successfully book a parking spot	User is logged in and has searched for available parking spots	1. Select an available parking spot. 2. Confirm the booking. 3. Submit the booking.	The system should confirm the booking and provide a booking reference.
Add Vehicle Details	Verify if a user can add their vehicle details to their account	User has logged in successfully	1. Navigate to the user profile. 2. Select "Add Vehicle". 3. Enter vehicle details. 4. Save.	The system should save the vehicle details and update the user profile.
Update Parking Status	Verify if users can update their status when leaving the parking area	User has an active parking reservation	1. Navigate to the active reservation. 2. Click on "Update Status". 3. Submit status change.	The system should update the reservation status and mark the parking spot as available again.
Lender Registration	Verify if a lender can successfully register and add parking space details	Lender has not registered before	1. Navigate to the lender registration page. 2. Enter valid details. 3. Submit the form.	The system should create the lender account and allow the lender to add parking locations.

Module	Test Case Description	Preconditions	Test Steps	Expected Result
Manage Bookings (Lender)	Verify if a lender can view and manage bookings for their parking spaces	Lender is logged in and has added parking space details	1. Navigate to the booking management page. 2. View list of bookings. 3. Accept/reject bookings.	The lender should be able to view bookings, accept/reject them, and manage availability of the parking spaces.
Feedback and Ratings	Verify if a user can provide feedback and rate the parking space after using it	User has completed a parking reservation	1. Navigate to the completed reservation. 2. Provide feedback. 3. Submit the rating and feedback.	The system should accept the feedback and update the parking space's rating accordingly.
View Parking History (User/Lender)	Verify if users and lenders can view their past parking reservations and bookings	User or lender has completed past reservations/bookings	1. Go to the parking history page. 2. View the list of past reservations/bookings.	The system should display a history of past parking transactions for both users and lenders.

VI. CONCLUSION

Since that we live in a technologically advanced environment, the online automobile parking reservation system enhances the current system. Adopting parking management system significantly reduces the amount of time consumed in seeking the parking space, renders valuable data upon the availability of the parking area, accurate mapping of the parking space, offers guidance and suggestion for proper vehicle parking increase the safety of the property since the parking lot is numbering. With this new system is mandatory, it enables the user of the system to reserve a parking slot online.

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