

CAR RESERVATION SYSTEM

**Project Proposal**

# Supervisor

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# Submitted by

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## **1-Introduction**

## Finding parking can be a hassle, especially in busy urban areas. Traditional parking systems often struggle with efficiency and user-friendliness. To tackle these issues, we propose a Car Reservation System that helps users easily find, reserve, and access parking spaces through QR codes.

## **2-Objective**

The main goal of the "Car Reservation System " project is to develop an easy-to-use web page that allows vehicle owners to quickly find, reserve, and access parking spaces through QR codes. This system will improve parking management efficiency and enhance the overall experience for users.

## **3-Problem Description**

The goal of the "Car Reservation System " project is to address important problems with parking accessibility and operational effectiveness in urban settings. The following succinctly describes the main issues:

Limited parking availability creates significant challenges for drivers trying to locate available spaces in real-time. The current reliance on manual entry and exit processes leads to inefficiencies in tracking vehicle movements in parking facilities.

Key challenges include: Real-time Space Detection, Manual Tracking Inefficiencies, User Experience, Technology Integration, and Data Management. The transition from traditional parking management to an automated system introduces complexities such as ensuring accurate data collection, providing seamless user interfaces, and maintaining system reliability.

Finally, in order to handle these complex issues, the "Car Reservation System " project provides a solution that improves parking accessibility, optimizes operations, and elevates the driving experience for drivers in cities.

## **4-Methodology**

To develop this system, we will adopt the following methodology:

User-Centric Design: Create an intuitive user interface using JSP, CSS, and JavaScript, ensuring a seamless experience for users.[1, 2, 3]

Application Development: Implement the application logic using Java for server-side development, enabling robust data handling and processing.

Database Management: Utilize MySQL to manage parking space data, reservations, and user information effectively.[4]

QR Code Generation: Integrate a library to generate QR codes for vehicle entries and exits, allowing users to easily access their reserved parking spots.

Testing and Quality Assurance: Conduct thorough testing to ensure the system operates smoothly, including unit testing and integration testing. [5]

## **5-Project Scope**

The project scope outlines the specific features and functionalities that will be developed as part of the parking reservation system. The primary focus is to create a user-friendly platform that streamlines the process of finding and reserving parking spaces while also providing essential tools for administrators to manage the system effectively. Below are the key components of the project scope:

User Registration and Authentication: Allow users to create accounts and manage their profiles.

Parking Space Reservation: Enable users to search for and reserve parking spaces in real-time.

QR Code Integration: Generate QR codes for each reservation, facilitating entry and exit.

Admin Dashboard: Provide an administrative interface for managing parking spaces, reservations, and user accounts.

## **6-Feasibility Study**

**Risks Involved:**

**6.1.1- Technical Risks**: Technical Risks: There are several potential challenges that could arise when attempting to integrate various technologies such as Java, JSP, and MySQL. The complexity involved in ensuring that these technologies communicate effectively and function harmoniously can lead to a range of technical difficulties that may impact project success.

Risk Mitigation: We will implement continuous integration and conduct regular testing.[5]

**6.1.2-Data Security**: Handling user data and payment information poses security risks. Data breaches or privacy issues could harm the project's reputation.

Risk Mitigation: We will follow best practices for data security, conduct security audits, and implement encryption measures to protect user data.

**6.1.3-Competitive Landscape**: There may be existing or emerging competitors in the market offering similar services, posing a risk to market share.

Risk Mitigation: We will conduct competitive analysis and continuously innovate to differentiate our application and maintain a competitive edge.

**6.1.4-User Acceptance**: Users may be hesitant to use a new system.

Risk Mitigation: Gather feedback and improve the application based on user suggestions.

**Resource Requirement:**

**6.2.1-Hardware:** Development workstations with sufficient processing power.

**6.2.2-Software:** NetBeans IDE for Java development, MySQL for database management, and libraries for QR code generation. [4,6,7]

**6.2.3-Human Resources**: A team of developers, testers, and a project manager.

**6.2.4-Time:** Allocate sufficient time for development, testing, and project management, considering the academic schedules of student team members.

In summary, managing risks and allocating resources properly is key to success. We can reduce technical risks by using continuous integration and regular testing while ensuring data security through best practices and encryption to protect user information. Additionally, careful planning of our time is essential to provide enough for development, testing, and project management, considering the academic schedules of team members. By focusing on these areas, we can significantly improve our chances of success.

## **7-Solution Application Areas**

## The Car Reservation System holds significant real-world value and targets several application domains within the parking industry. The primary target domains and how they may benefit from our solution are as follows:

**Benefits to the Parking Industry:**

* **Vehicle Owners:** Easier access to parking, significantly reducing the time spent searching for available spots.
* **Parking Operators:** Improved management of parking facilities, leading to increased customer satisfaction and streamlined operations.

## **8-Tools/Technology**

Software Tools/Technologies:

1. Languages: JSP, CSS, JavaScript (frontend) and Java (backend).[1,2,3,6]
2. Database: MySQL for efficient data management and storage.[4]
3. IDE Tool: NetBeans for Java development, providing a robust environment for coding and testing.[6,7]
4. Development Workstations: laptops with sufficient processing power and memory to support the selected development environments and tools.
5. Internet Connection: High-speed internet access to facilitate development, collaboration, and access to necessary online resources

## **9-Expertise of the Team Members**

We are a team of undergraduates who have studied frontend and backend technologies in software development courses. Additionally, while working on a small project for a company during our internship and concentrating on both the frontend and backend parts, we acquired invaluable skills. Our practical experience has greatly improved our knowledge and abilities related to project development in the actual world.

## **10-Milestones**

1. Project Initiation (Week 1-2)
2. User Interface Design (Week 3-15)
3. FrontEnd Development (Week 3-15)
4. BackEnd Development (Week 3-15)
5. QR Code Integration (Week 3-15)
6. Testing (Week 15-18)
7. Deployment and Launch (Week 19)

## **11-Timeline Chart**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Development Phase** | **19**  **Weeks** | | | | | | | Duration |
| 1st  week | 2nd-7th  week | 8th – 11th  week | 12th– 14th  week | 15th-17nd  week | 18rd  week | 19th  week |
| **Project Initiation** |  |  |  |  |  |  |  | 1st  week |
| **User Interface Design** |  |  |  |  |  |  |  | 2nd-7th  week |
| **FrontEnd Development** |  |  |  |  |  |  |  | 8th – 11th  week |
| **BackEnd Development** |  |  |  |  |  |  |  | 12th– 14th  week |
| **QR Code Integration** |  |  |  |  |  |  |  | 15th-17nd  week |
| **Testing** |  |  |  |  |  |  |  | 18rd  week |
| **Deployment and Launch** |  |  |  |  |  |  |  | 19th  week |
| **Total Time** | 10 | 60 | 40 | 40 | 60 | 10 | 10 | 19 weeks |

## **12-References**

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[5] Software Testing and Analysis: Process, Principles and Techniques, Wiley, ISBN 0471455938., Mauro Pezzè, Michal Young, 2008, Wiley

[6] Liang, Y.D., Introduction to Java Programming and Data Structures, Comprehensive Version, 12th Edition, Pearson, 2020, ISBN: 978-0136520238 (Textbook)

[7] Beginning NetBeans IDE Copyright © 2015 by Geertjan Wielenga