VEHICLE PARKING MANAGEMENT SYSTEM

A

Project Report

submitted

In Partial fulfilment of the requirements for award of the degree of

Bachelor of

**Computer Application**

SUBMITTED BY

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**BONA FIDE CERTIFICATE**

This is to certificate that this project work entitled “**<Title of the Project>**” is Bonafide record work done by <Student Name> **(Register No:<20SPCS001>)**  in partial fulfillment for the award of the degree of M.Sc(Computer Science) of **MANNAR THIRUMALAI NAICKER COLLEGE(Autonomous)**.

Submitted for the project evaluation and viva voce held on ………………...

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**Internal Guide HOD**

**EXTERNAL EXAMINER**

**DECLARATION**

I hereby declare that this software project done under the title “**<Title of the Project>**” is submitted for the award of M.Sc.(Computer Science) is the original work and that no part of this project has been submitted fully or partially for any other reorganization earlier.

Date : SIGNATURE

Place : MADURAI < Student Name>

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## ****1. Introduction****

### ****1.1 Abstract****

The Vehicle Parking Management System is a web-based application designed to manage parking check-ins efficiently. It provides a structured and automated approach for administrators to monitor parking activities and for students to check in their vehicles. The system is developed using **HTML, CSS, and JavaScript** for the front-end, **PHP** for the back-end, and **MySQL** as the database. It is hosted locally using **XAMPP**. The system aims to **eliminate manual record-keeping**, ensuring a streamlined and accurate parking management process.

This project consists of **two user roles**:

* **Admin**: Manages parking data, user accounts, and check-ins.
* **Student**: Can log in and check in their vehicle.

The **entry page** displays traffic rules and driving regulations, along with a contact button and a login button. Upon clicking the login button, users are redirected to the login page. Based on their credentials, they are taken to their respective dashboards:

* **Admin Dashboard**: Displays check-in records, allows user management, and provides an overview of parking activities.
* **Student Dashboard**: Enables students to check in their vehicles and view their past records.

This system enhances efficiency, security, and reliability in managing parking records while reducing manual workload. It is **scalable**.

### ****1.2 Project Description****

The **Vehicle Parking Management System** is designed with **two user roles:**

### ****1. Admin Role**** 🏢

The **Admin** is responsible for managing the entire parking system. Their main tasks include:

* **Managing Parking Data** → Viewing, updating, and organizing vehicle check-in records.
* **User Management** → Adding, updating, or removing student accounts.
* **Handling Check-ins** → Monitoring vehicle check-ins to ensure proper record-keeping.
* **Dashboard Access** → Viewing an overview of current parking status and activities.

### ****2. Student Role**** 🎓

The **Student** has limited access and can only perform parking-related tasks:

* **Logging into the System** → Using their unique credentials (ID & password).
* **Checking In Their Vehicle** → Recording their vehicle’s entry into the parking area.
* **Viewing Their Dashboard** → Checking past parking records and system notifications.

### ****System Workflow****

1. **Landing Page (Home Page)**
   * Displays **traffic rules** and **driving guidelines** for awareness.
   * Includes a **Contact Button** (for inquiries) and a **Login Button**.
2. **Login Page**
   * Users enter their **ID and password** to access the system.
   * Based on their role (Admin or Student), they are redirected to their respective dashboards.
3. **Dashboard**
   * **Admin Dashboard** → Displays system analytics, user management options, and parking data.
   * **Student Dashboard** → Shows check-in history and allows vehicle check-in.

## ****2. System Analysis****

### ****2.1 Existing System****

The traditional vehicle parking system is **manual** and **paper-based**, causing several inefficiencies. Below are the key drawbacks of the existing system:

* **Time-Consuming Process**: Manual entries of vehicle check-ins lead to delays.
* **Data Inaccuracy**: Human errors can result in incorrect records.
* **Security Issues**: Unauthorized access to parking areas is common.
* **Lack of Real-Time Monitoring**: No live tracking of vehicle entries and exits.
* **Difficult Record-Keeping**: Paper logs are prone to loss, damage, or mismanagement.

These inefficiencies highlight the need for an automated **Vehicle Parking Management System** that ensures a streamlined, accurate, and secure parking process.

### ****2.2 Proposed System****

The **proposed Vehicle Parking Management System** introduces an automated solution that improves efficiency, accuracy, and security. The main features of the proposed system include:

* **Digital Check-in System**: Eliminates manual entry errors by allowing students to check in their vehicles digitally.
* **Admin Control Panel**: Provides administrators with access to manage check-ins, users, and parking records.
* **Secure User Authentication**: Ensures only authorized users (admins and students) can access the system.
* **Real-Time Data Management**: Enables instant updating and retrieval of parking data.
* **User-Friendly Interface**: A simple and intuitive design for easy navigation.
* **Local Server Hosting (XAMPP)**: Ensures data is stored and managed securely on a local server.

### ****Benefits of the Proposed System****

* **Reduces Human Errors**: Automated data entry ensures accuracy.
* **Enhances Security**: Prevents unauthorized parking with user authentication.
* **Improves Efficiency**: Reduces time spent on manual record-keeping.
* **Easy Data Access**: Allows users to view and manage parking records efficiently.

The proposed system offers a **structured, secure, and user-friendly solution** to traditional parking management challenges.

## ****3. System Requirement Specification****

### ****3.1 Hardware Specification****

* **Processor:** 1x Intel® Celeron® N4020 Processor(Celeron® N4020)
* **RAM:** 8GB
* **Storage:** 256GB SSD
* **Local Server:** XAMPP installed

### ****3.2 Software Specification****

* **Operating System:** Windows 10
* **Front-end:** HTML, CSS, JavaScript
* **Back-end:** PHP
* **Database:** MySQL
* **Server:** Apache (via XAMPP)

#### ****3.2.1 Description of Software****

* **XAMPP**: A software package for running Apache, PHP, and MySQL on a local machine.
* **PHP**: A server-side scripting language used to process data.
* **MySQL**: A relational database system to store users, parking records, and other relevant information.

## ****4. System Design****

### ****4.1 Database Design****

The **Vehicle Parking Management System** database is designed using **MySQL** to ensure **efficient data management** and **secure storage** of user and parking records. The database consists of multiple tables that store necessary information about users, parking details, and check-in records.

#### ****4.1.1 Table Design****

1. **Users Table**

|  |  |  |
| --- | --- | --- |
| Column Name | Data Type | Description |
| user\_id | INT (PK, Auto-increment) | Unique identifier for each user |
| username | VARCHAR(255) | Unique login username |
| password | VARCHAR(255) | Encrypted user password |
| role | ENUM ('Admin', 'Student') | Defines user role |

1. **Parking Check-in Table**

|  |  |  |
| --- | --- | --- |
| Column Name | Data Type | Description |
| checkin\_id | INT (PK, Auto-increment) | Unique identifier for check-in |
| user\_id | INT (FK referencing Users) | User who checked in |
| vehicle\_number | VARCHAR(20) | Vehicle registration number |
| checkin\_time | DATETIME | Time of check-in |

1. **Admin Management Table**

|  |  |  |
| --- | --- | --- |
| Column Name | Data Type | Description |
| admin\_id | INT (PK, Auto-increment) | Unique identifier for admin actions |
| user\_id | INT (FK referencing Users) | Admin user who performed the action |
| actions\_performed | TEXT | Description of admin actions |
| timestamp | DATETIME | Date and time of action |

The **database structure** ensures **data integrity, security, and efficient query processing**.

### ****4.2 Data Flow Diagram / ER Diagram****

* **DFD Level 0:** Basic flow from user login to parking check-in.
* **ER Diagram:** Defines relationships between users, vehicles, and parking slots.

### ****4.3 Input / Output Design****

* **Input:**
  + User login credentials
  + Parking check-in information (vehicle number, user ID)
* **Output:**
  + Confirmation messages
  + Stored parking records
  + Dashboard display

## ****5. System Implementation****

### ****5.1 Module Description****

The system consists of two main modules:

#### ****Admin Module:****

* **Login System**: Admins log in using unique credentials to gain access to the system.
* **Dashboard**: Displays key parking statistics, such as the number of available and occupied slots.
* **Parking Management**: Allows admins to view, update, and delete parking records, ensuring efficient management.
* **User Management**: Enables the admin to add, remove, or update user details, maintaining proper user access control.
* **Slot Management**: Admins can update slot statuses, marking them as available or occupied based on real-time parking data.

#### ****Student Module:****

* **Login System**: Students log in using their registered credentials to access the parking system.
* **Dashboard**: Displays the student's check-in status, assigned parking slot, and relevant parking information.
* **Parking Check-in**: Allows students to check in their vehicles to an available slot, updating the system in real time.

### ****5.2 Sample Code****

#### ****PHP Code for Login Authentication****

php

CopyEdit

session\_start();

include('db.php');

if(isset($\_POST['login'])) {

$id = $\_POST['id'];

$password = $\_POST['password'];

$query = "SELECT \* FROM users WHERE id='$id' AND password='$password'";

$result = mysqli\_query($conn, $query);

if(mysqli\_num\_rows($result) > 0) {

$\_SESSION['user\_id'] = $id;

header("Location: dashboard.php");

} else {

echo "Invalid credentials";

}

}

## ****6. System Testing****

* **Unit Testing:** Testing individual modules like login, check-in functionality.
* **Integration Testing:** Ensuring seamless communication between the database and front-end.
* **User Testing:** Checking system usability for students and administrators.

## ****7. Future Enhancements****

* **RFID or QR Code integration** for vehicle check-ins.
* **Mobile application support** for on-the-go access.
* **Real-time parking slot availability display**.

## ****8. Conclusion****

The **Vehicle Parking Management System** enhances parking management by **automating check-ins, reducing manual work, and ensuring efficient record keeping**. With future enhancements, the system can be more seamless and user-friendly.

## ****Bibliography****

* PHP & MySQL development tutorials
* Web-based parking system references

## ****Appendices****

### ****Appendix A: Screenshots****

* Landing Page
* Login Page
* Admin Dashboard
* Student Dashboard

### ****Appendix B: Additional References****

* XAMPP setup guide
* MySQL database installation and configuration