DBMS PROJECT

CarRentalServices

Web-Based Car Rental System: A Comprehensive Solution for Urban Mobility Optimization

PRESENTED BY

Vedant Agarwal - 2112128
Deep Saikia -2112129
Tolemy Kashyap - 2112130
Raviranjan Patel - 2112131
Pragya Annesha Baruah - 2112132
Praptipal Kour - 2112133

PROBLEM

Inefficient and fragmented urban mobility necessitates the development of an integrated and user-centric car rental system to enhance accessibility, streamline reservation processes, and contribute to sustainable transportation solutions

Key challenges

1. Fleet management
2. Reservation Handling
3. Customer Management
4. Pricing and billing
5. Vehicle Maintenance
6. Inventory Management
7. Customer Experience

APPROACH FOR SOLVING

The web-based system developed for the car rental services project addresses key urban mobility challenges. Through a MySQL database, the application offers distinct roles for administrators, office staff, and users, enhancing overall operational efficiency. Users benefit from a seamless interface, contributing to a comprehensive and sustainable solution for urban mobility needs.

INTRODUCTION

In response to the pressing challenges of contemporary urban mobility, innovative solutions are imperative to optimize transportation efficiency, reduce environmental impact, and enhance the user experience. The proposed web-based car rental system strategically addresses these issues, aiming to provide a comprehensive solution.

SYSTEM ARCHITECTURE

Admin:

- Manages users, offices, and system configurations.
- Ensures seamless platform functionality.
- Oversees integration of new offices.

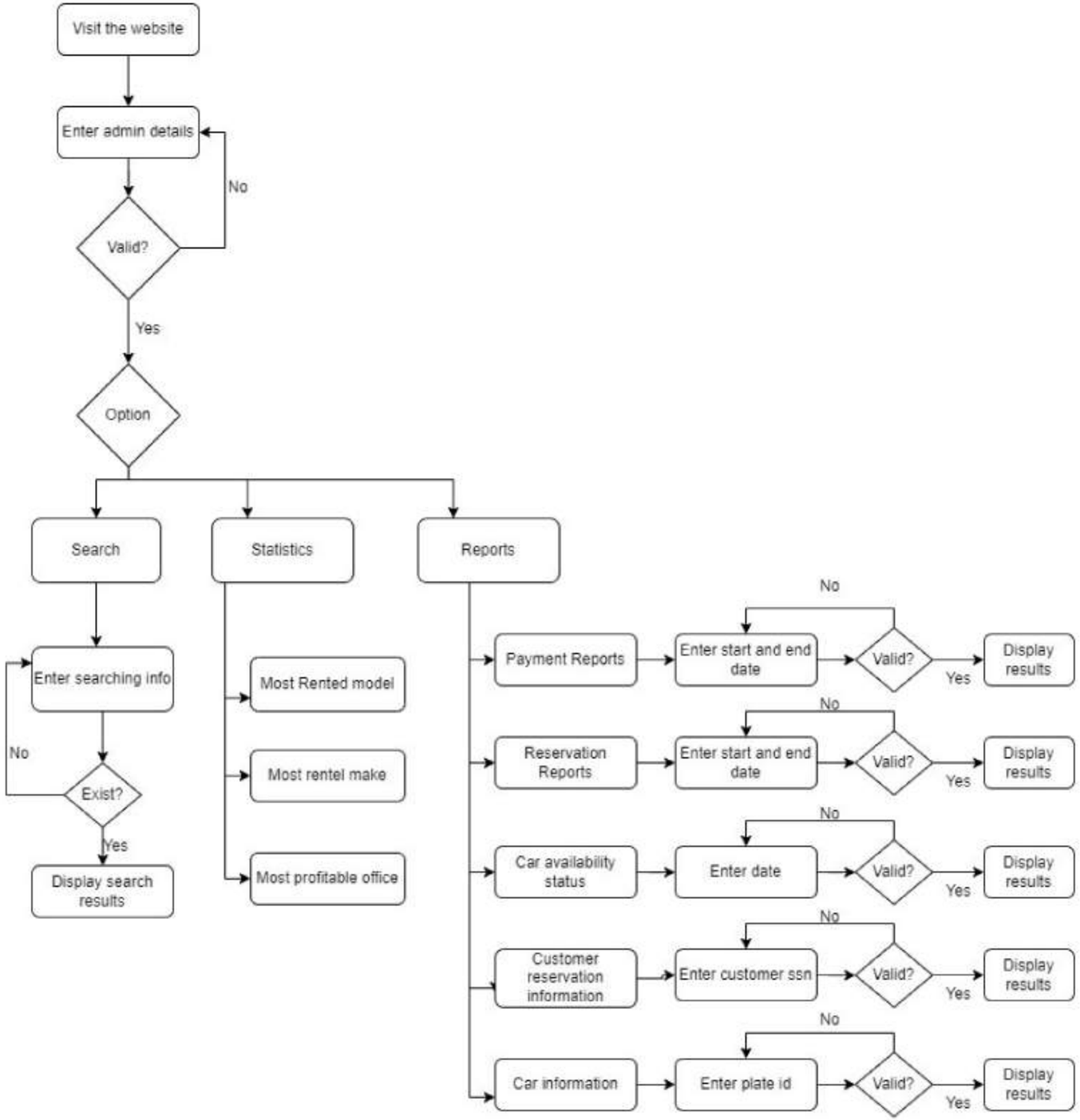
Office:

- Signs up on the website.
- Posts details of available cars and manages inventory.
- Integration of multiple offices enhances user options.

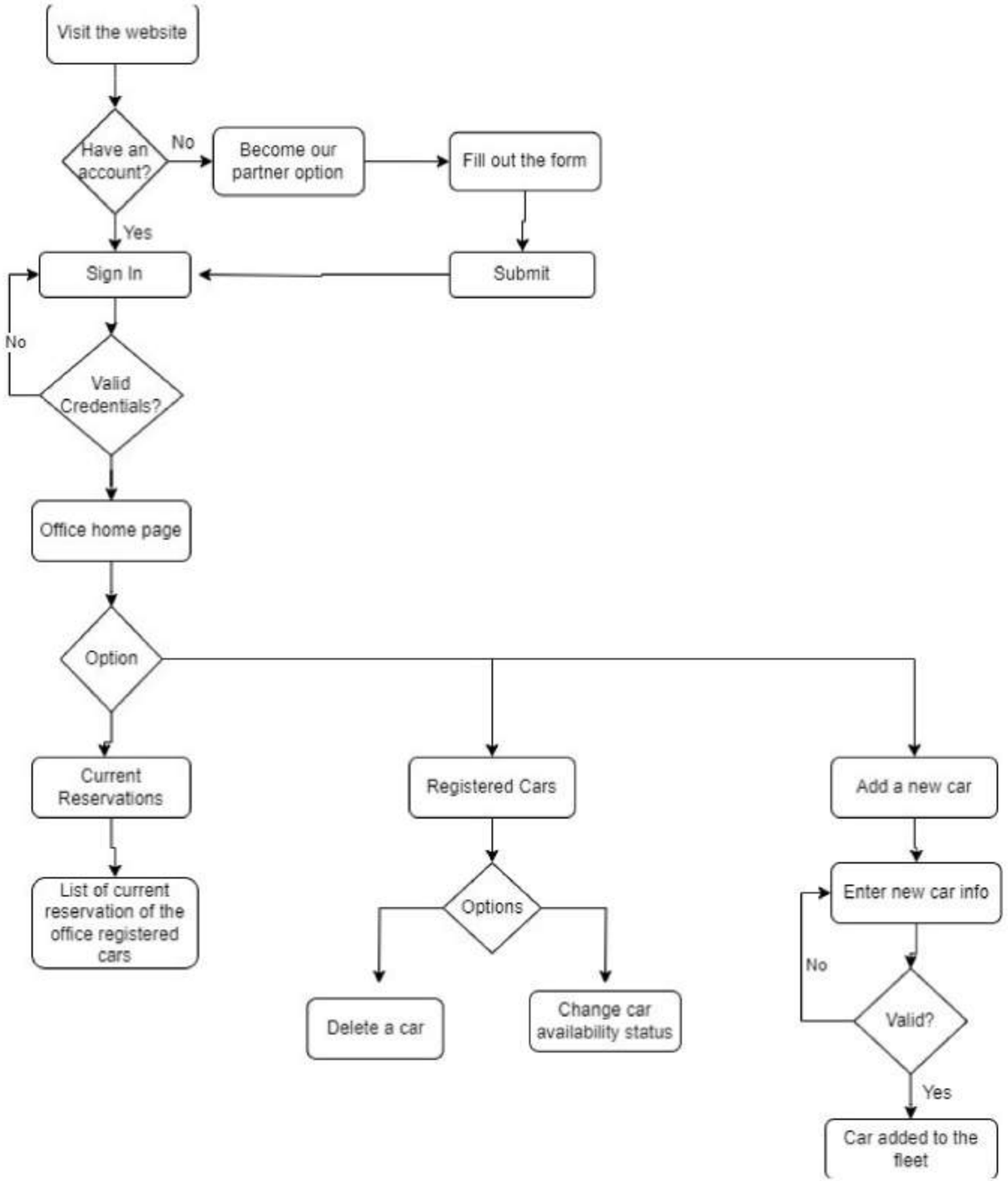
User:

- Signs up and searches for cars based on dates and preferences.
- Makes reservations.
- Platform serves as a centralized hub for car rental transactions.

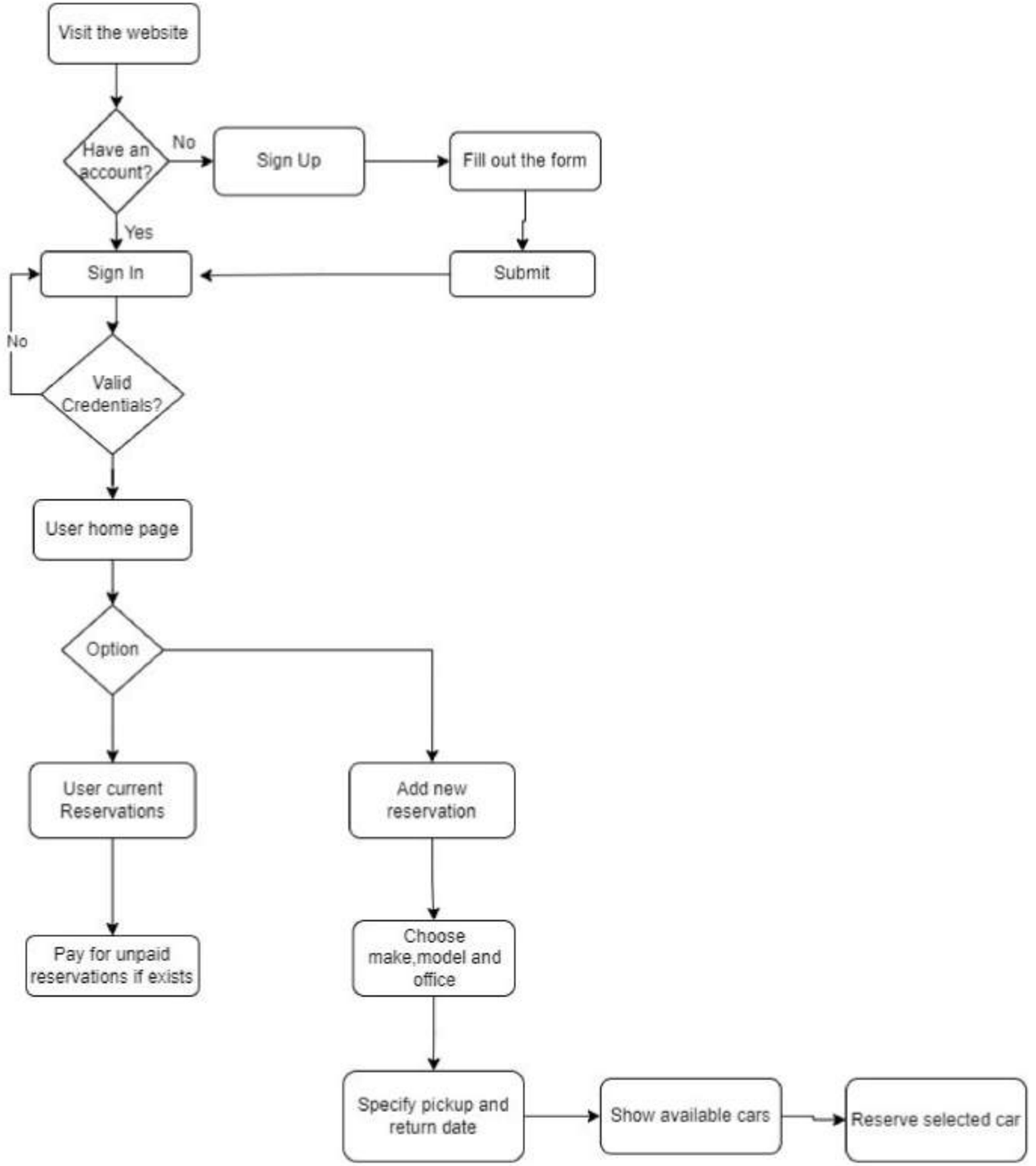
Admin Flowchart



Office Flowchart



User Flowchart

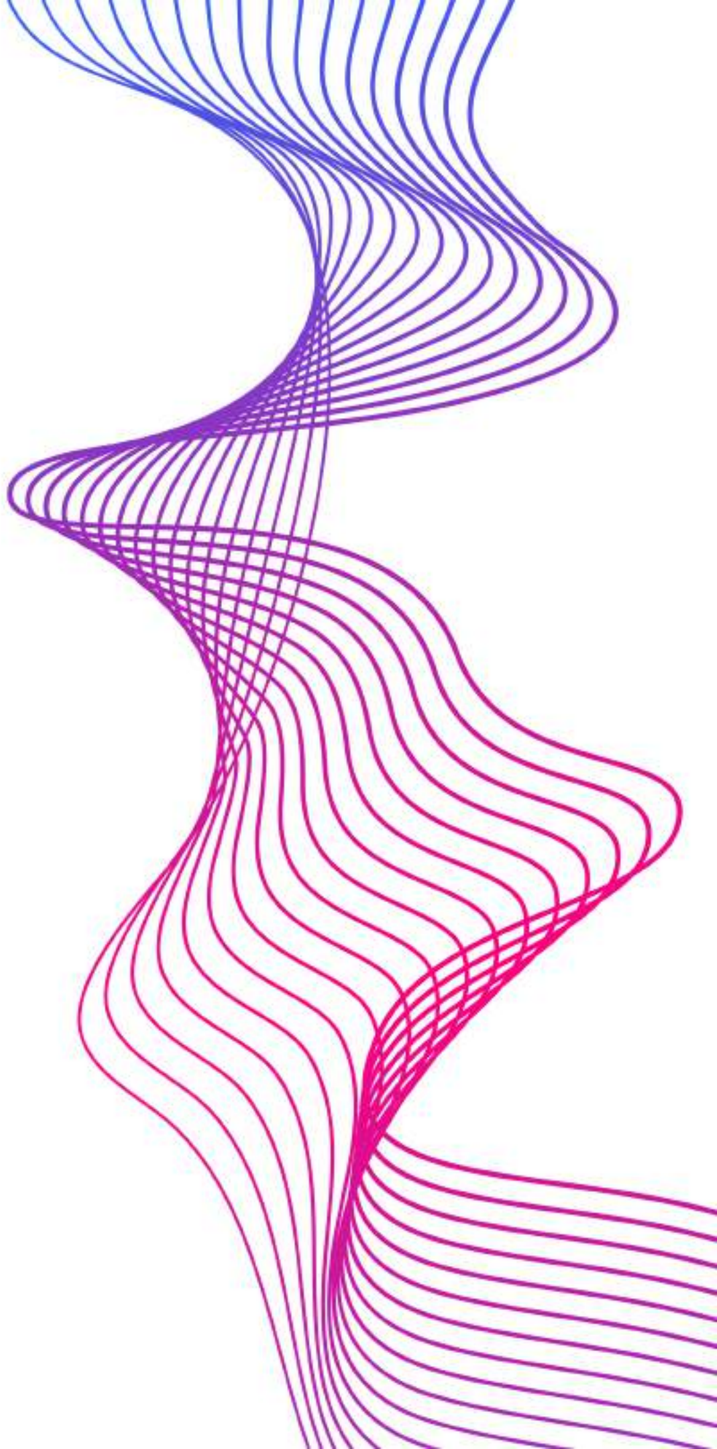


USER INTERACTION

The user experience is paramount in the success of the car rental system. The user interface is designed to be intuitive and responsive, ensuring a positive and efficient experience.

RESERVATION PROCESS

- Reservation process is a critical juncture in the user journey.
- The system allows the customers to search for available cars based on their preferences, including pickup and return dates, car model, make, location, and rental office details.
- User initiates car reservation after selection.
- Payment options include immediate or deferred payment.
- Flexibility in payment accommodates diverse user preferences.



OFFICE MANAGEMENT

- Dedicated office dashboard for efficient fleet management.
- Offices update car availability and review reservations through the dashboard.
- Performance analytics accessible for data-driven decision-making.
- Communication channels ensure timely updates between offices and users.
- Smooth exchange of information facilitated within the system.
- Integration of analytics empowers offices in optimizing the car rental process.

Frontend

- Frontend design crucial for an intuitive and engaging user interface.
- Prioritizes responsiveness for consistent experience across devices.
- Technologies used for frontend implementation:

    - HTML5: Structures and presents content, ensuring a semantic layout.
    - CSS3: Enhances visual appeal and responsiveness for an aesthetic design.
    - JavaScript: Enables dynamic functionalities and real-time updates.
    - Ajax: Optimizes user experience with asynchronous data exchange for seamless content retrieval.

Backend

Tech Stack:

Node.js, Express, JWT, Bcrypt, MySQL for a robust backend.

Node.js & Express:

- Non-blocking, event-driven for scalability.
- Express optimizes route handling and structure.

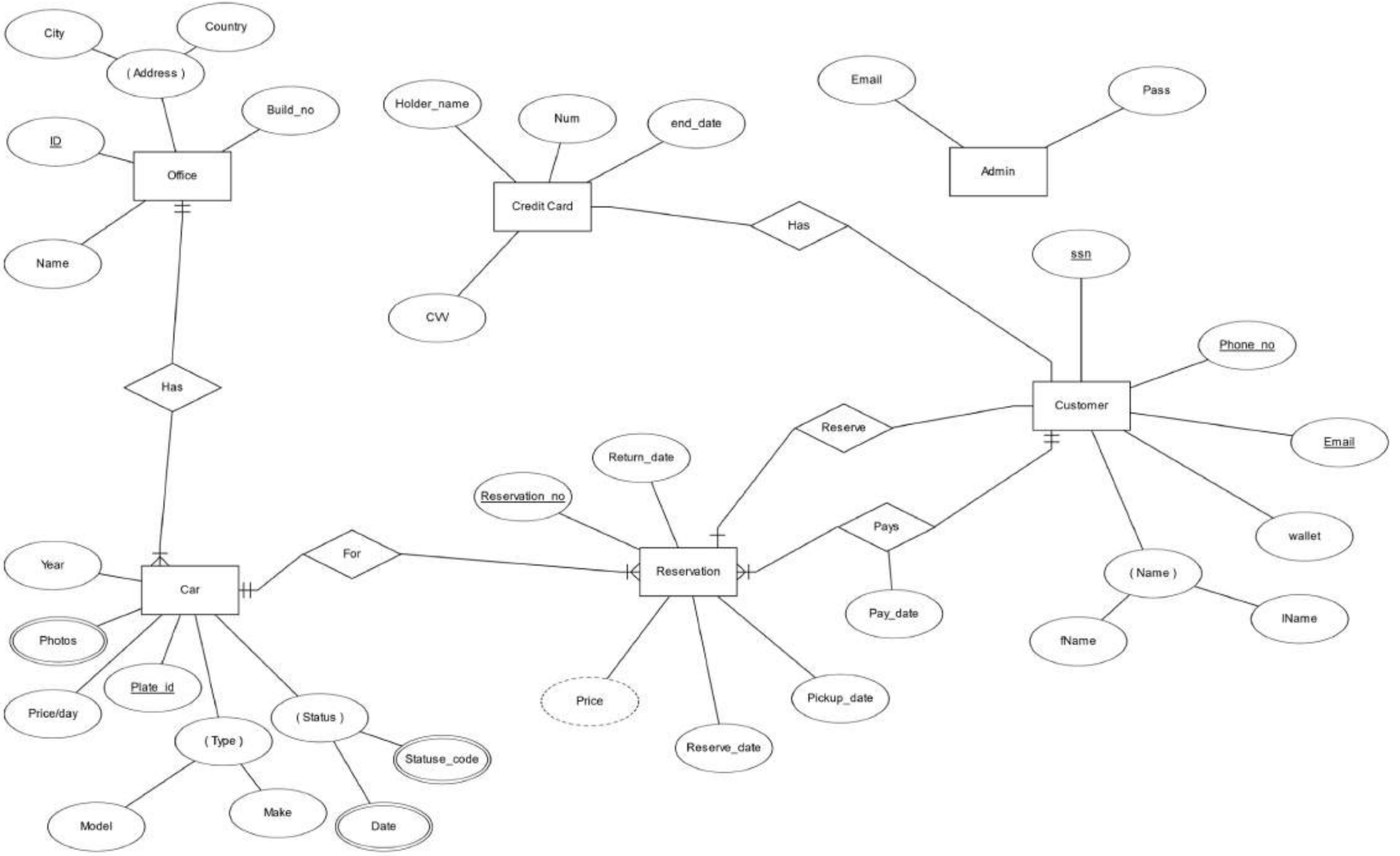
JWT and Bcrypt Authentication:

- Secure, stateless user authentication.
- Adaptive hashing and salting for password protection.

MySQL Database:

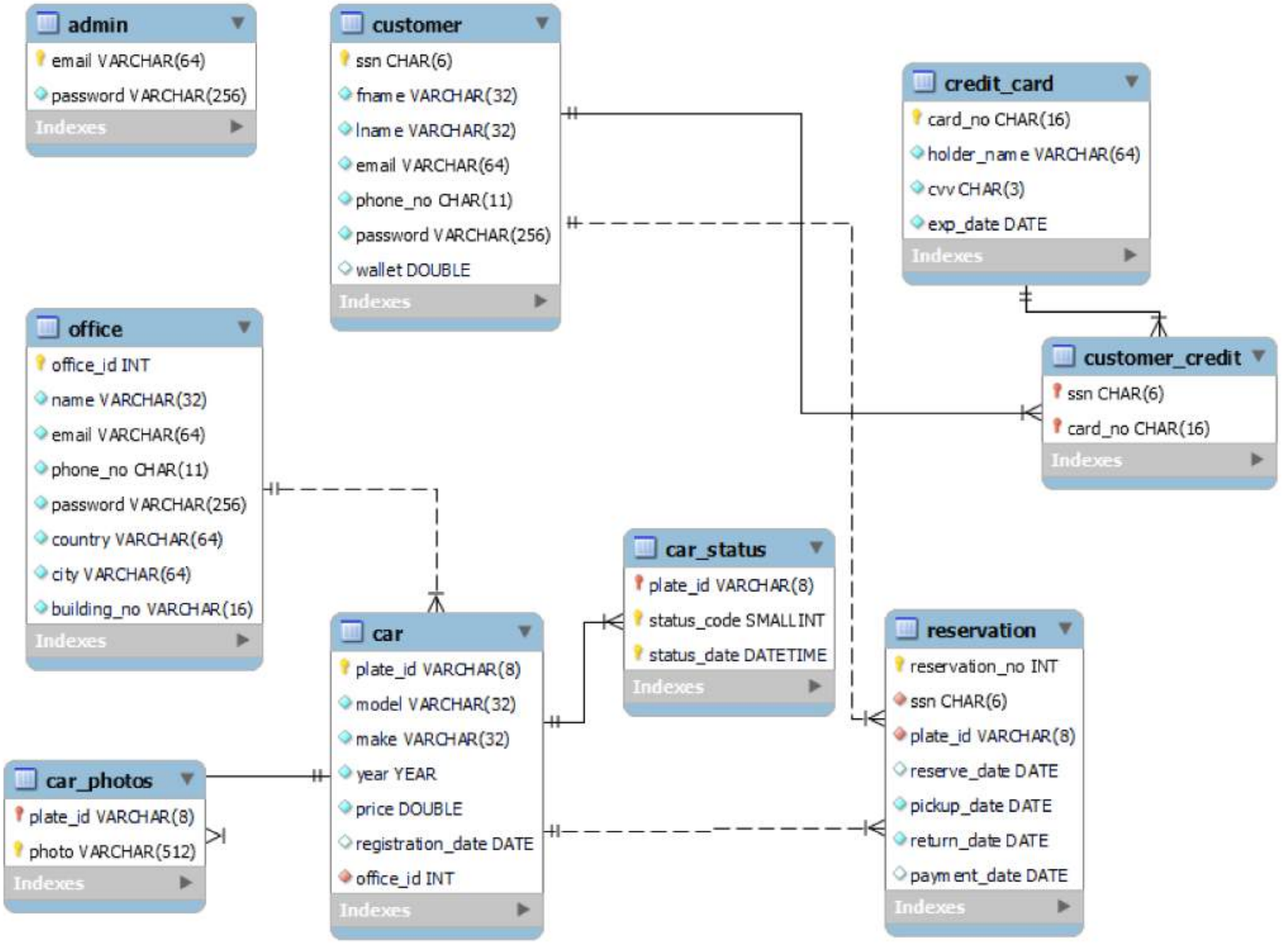
- RDBMS ensures structured, scalable data storage.
- SQL DML queries for seamless data manipulation, maintaining integrity.

E R D I A G R A M


City
Country
(Address)
Build_no
ID
Office
Name
Has
Holder_name
Num
end_date
Credit Card
CW
Has
Email
Pass
Admin
ssn
Phone_no
Customer
Email
wallet
(Name)
fName
lName
Reserve
Return_date
Reservation_no
Reservation
Pays
Pay_date
Price
Reserve_date
Pickup_date
For
Year
Car
Photos
Plate_id
Price/day
(Type)
Model
Make
(Status)
Statuse_code
Date

DATABASE

1	Admin Table
2	Customer Table
3	Credit Card Table
4	Customer Credit Table
5	Office Table
6	Car Table
7	Reservation Table
8	Car Photos Table
9	Car Status Table


admin
email VARCHAR(64)
password VARCHAR(256)
Indexes
customer
ssn CHAR(6)
fname VARCHAR(32)
lname VARCHAR(32)
email VARCHAR(64)
phone_no CHAR(11)
password VARCHAR(256)
wallet DOUBLE
Indexes
credit_card
card_no CHAR(16)
holder_name VARCHAR(64)
cvv CHAR(3)
exp_date DATE
Indexes
customer_credit
ssn CHAR(6)
card_no CHAR(16)
Indexes
office
office_id INT
name VARCHAR(32)
email VARCHAR(64)
phone_no CHAR(11)
password VARCHAR(256)
country VARCHAR(64)
city VARCHAR(64)
building_no VARCHAR(16)
Indexes
car_status
plate_id VARCHAR(8)
status_code SMALLINT
status_date DATETIME
Indexes
car
plate_id VARCHAR(8)
model VARCHAR(32)
make VARCHAR(32)
year YEAR
price DOUBLE
registration_date DATE
office_id INT
Indexes
reservation
reservation_no INT
ssn CHAR(6)
plate_id VARCHAR(8)
reserve_date DATE
pickup_date DATE
return_date DATE
payment_date DATE
Indexes
car_photos
plate_id VARCHAR(8)
photo VARCHAR(512)
Indexes

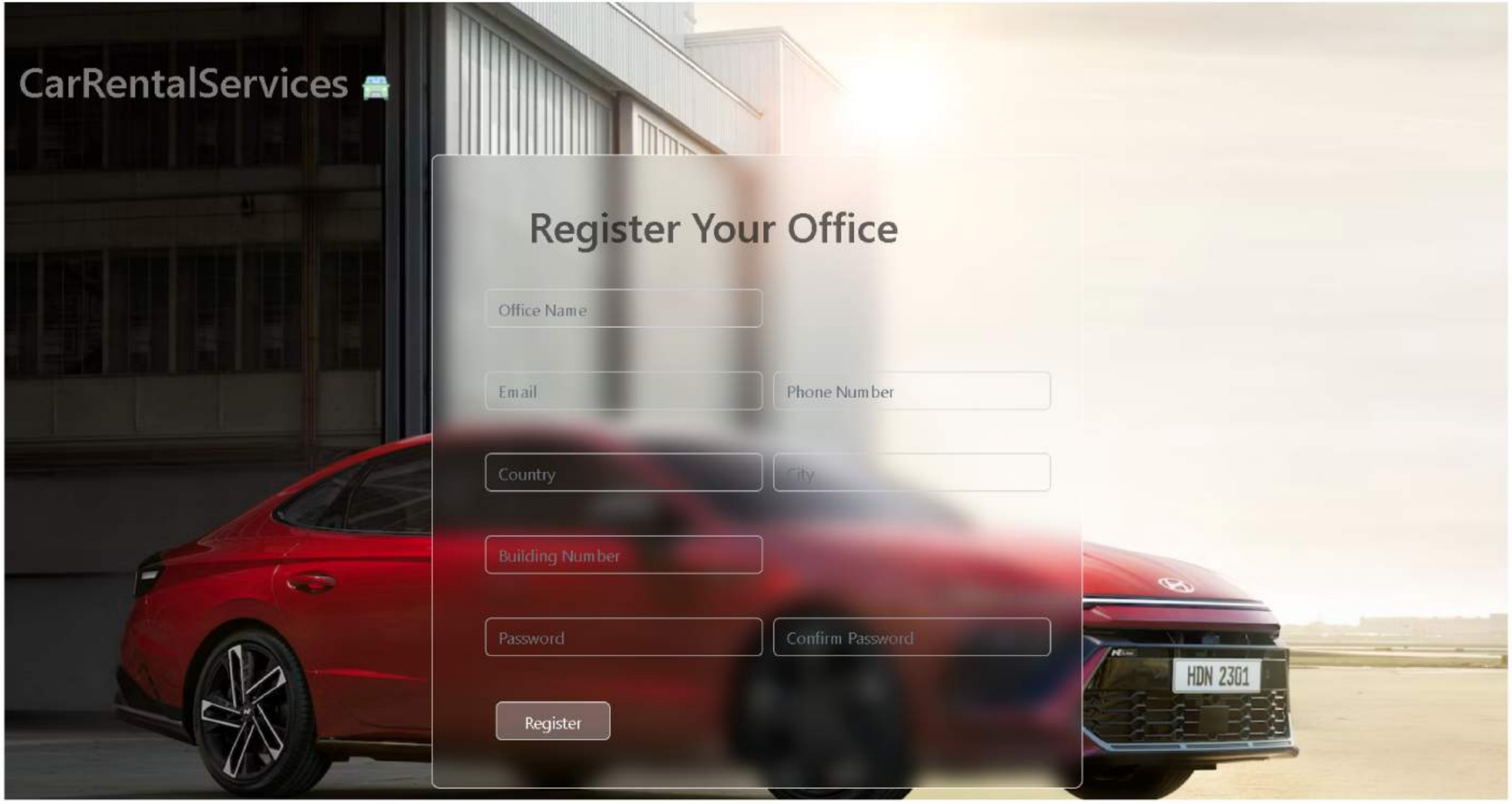
CarRentalServices

Experience the freedom of renting with our collection of cars. We offer the best services with the best work, so you can enjoy your holidays with our wheels. Our local and personalized service ensures that you have the ultimate rental experience. Start your journey here and unlock adventure with confidence on four wheels.

Start your journey!

Email

Sign up


CarRentalServices
Register Your Office
Office Name
Email
Phone Number
Country
City
Building Number
Password
Confirm Password
Register
HDN 2301

CONCLUSION

In summary, the web-based car rental system, blending cutting-edge technologies and robust infrastructure, offers a scalable, secure, and user-friendly solution for urban mobility challenges. With a forward-looking design and commitment to sustainability, it not only addresses current issues but also sets the stage for ongoing innovation in the evolving landscape of urban mobility solutions.