

DOKUZ EYLUL UNIVERSITY
ENGINEERING FACULTY
DEPARTMENT OF COMPUTER ENGINEERING

CME3201 DATABASE MANAGEMENT SYSTEMS
TERM PROJECT

From The Store To Wherever You Want

FINAL REPORT

by

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ABSTARCT

This project aims to revolutionize the shopping and transportation experiences in supermarkets, with a specific focus on addressing the unique challenges faced by both individual and corporate customers. The primary concern is the high transportation costs and increased carbon emissions incurred by customers, particularly those without personal vehicles, who rely on taxis or rideshare services for transporting groceries. This issue is exacerbated for bulk purchases, including items like furniture.

Similarly, corporate customers making regular bulk purchases face the dilemma of investing in dedicated vehicles, which often results in underutilized resources and additional expenses. To tackle these challenges, the project proposes the development of a novel website offering an on-demand chauffeured transportation service. This service will utilize vehicles owned by the supermarket and operated by its staff, thereby ensuring affordability and environmental sustainability.

The anticipated outcomes of this initiative include a significant reduction in carbon emissions due to decreased reliance on personal vehicles, a cost-effective alternative to conventional taxi services for individual customers, and the elimination of the need for corporate customers to purchase and maintain dedicated vehicles. Ultimately, this project aims to enhance the overall shopping experience while contributing positively to environmental sustainability and economic efficiency.

PROBLEM SPECIFICATIONS

To effectively address the challenges within the problem domain, specific project specifications and requirements must be identified and considered. These specifications define the key features and functionalities necessary for the successful implementation of the project. The problem specifications are as follows:

Website Development: The project necessitates the creation of a user-friendly and responsive website that allows customers to access the chauffeured transportation service. The website should be accessible via both desktop and mobile devices to cater to a broad user base.

Vehicle Selection: The system must provide customers with the ability to select a vehicle of an appropriate size to accommodate their shopping needs. This feature ensures that customers can choose a vehicle that matches the volume of their purchases, optimizing cost and convenience.

Route Information: Customers should have access to route information, allowing them to plan and visualize the most efficient way to transport their purchased items. This includes real-time traffic updates and route recommendations.

Appointment System: The project requires a robust appointment system that allows users to schedule transportation services at their convenience. This system should include features for both appointment

creation and cancellation, ensuring flexibility.

User Profiles: The system should provide users, whether individuals or corporate customers, with profile pages where they can view their past transfers.

Separate Panels: The project demands separate user interfaces for three distinct user groups: customers, drivers, and the supermarket business. Each panel should offer specific features tailored to the needs and roles of these stakeholders.

SOLUTION SYSTEM

The solution system is a user-friendly online platform that provides a chauffeured transportation service. It includes a website accessible on desktop and mobile devices, vehicle selection options, real-time route information, an appointment system, a rating and review system, and user profiles. The system caters to individual and corporate customers, as well as supermarket drivers. It ensures cost-effective, eco-friendly transportation and aims to enhance the overall shopping experience while reducing costs and carbon emissions.

SYSTEM SERVICES

The system offers a range of services tailored to meet the diverse needs of its users:

- Vehicle Selection
- Route Planning
- Appointment Management
- User Profiles
- Business Management

REQUIREMENTS

Functional Requirements

- **User Authentication:** The website must support user registration, login, and authentication for customers and admins.
- **Vehicle Selection Tool:** A feature allowing customers to select vehicles based on size, and other criteria relevant to their shopping needs.
- **Appointment Scheduling System:** A calendar-based interface for customers to book transformation services.
- **User Profile Management:** Capability for users to create and manage profiles, view past transfers, see and change their personal information.
- **Responsive Web Design:** The website should adapt to different screen sizes and devices, providing a consistent user experience across desktops, laptops, tablets, and smartphones.

Non - Functional Requirements

- **Usability:** The website should be user-friendly with an intuitive interface for ease of navigation.
- **Scalability:** The system should be capable of handling an increasing number of users, vehicles, and transactions without performance degradation.
- **Cross-Browser Compatibility:** The website should function correctly across different web browsers.
- **Security:** Robust security measures to protect user data, including secure authentication and data encryption.
- **Maintainability:** The system should be easy to maintain and update, with clear documentation and modular design.

SYSTEM ARCHITECTURE

The application's backend is powered by the .NET MVC framework, interfacing with an MSSQL database. The frontend is crafted using a combination of JavaScript, CSS, and HTML, ensuring a dynamic and responsive user experience.

Backend Architecture

Model-View-Controller Paradigm: Our application leverages the MVC architecture inherent in .NET, promoting separation of concerns. This design pattern divides the application into three interconnected components, enhancing maintainability and scalability.

Model: The model component represents the application's dynamic data structure, independent of the user interface. It directly manages the data, logic, and rules of the application. In our system, models are designed to interact seamlessly with the MSSQL database, handling data retrieval, storage, and manipulation.

View: Views in our application are responsible for presenting data from the model to the user. They are the application's user interface—HTML pages and dynamic UI components. The integration of CSS and JavaScript further enhances these views, providing a rich and interactive user experience.

Controller: Controllers act as an intermediary between models and views. They receive input from users via views, process it (with possible model interaction), and return the output display data to the views. Our controllers are adept at handling various HTTP requests and directing the flow of data in the application.

Backend Architecture

Database Design: Our application utilizes Microsoft SQL Server (MSSQL) for database management. The database schema is carefully designed to optimize data storage, retrieval, and integrity.

Data Access Layer: The integration between .NET MVC and MSSQL is facilitated through a data

access layer, which abstracts the database operations from the business logic. This layer uses Entity Framework, a powerful ORM, for efficient database operations like CRUD (Create, Read, Update, Delete) functionalities.

Frontend Architecture

HTML: We use HTML to structure the content of our web pages. It forms the backbone of the user interface, defining elements like headers, paragraphs, and forms.

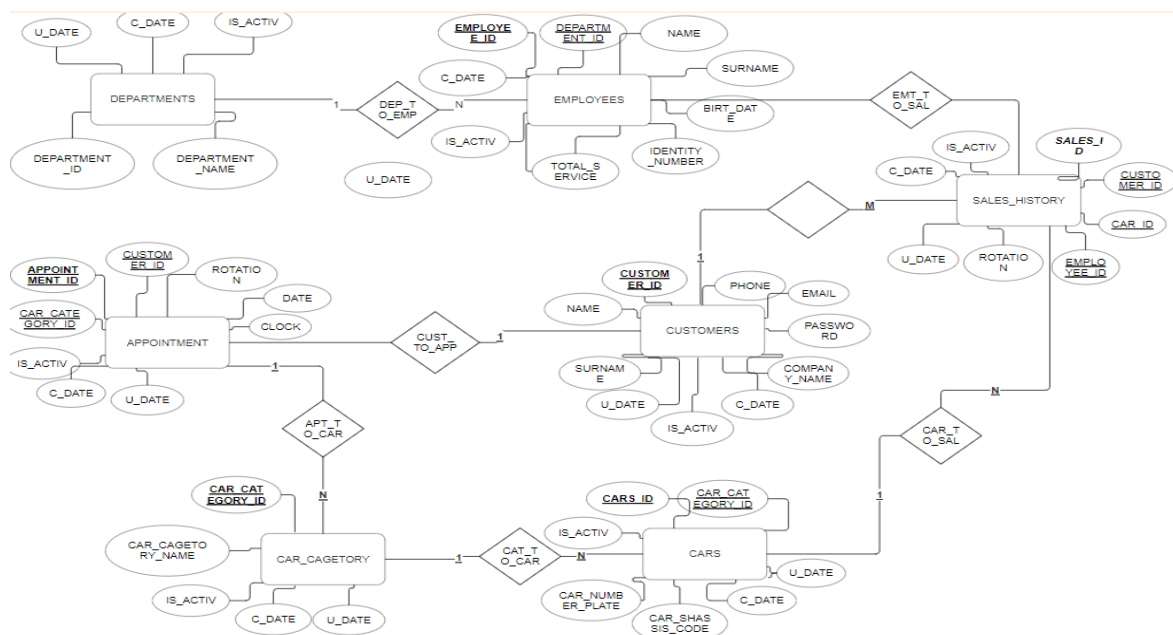
CSS: Cascading Style Sheets (CSS) are employed to style the HTML content. CSS enhances the visual appearance of our application, including layouts, colors, and fonts, contributing to a user-friendly and aesthetically pleasing interface.

JavaScript: JavaScript is utilized for client-side scripting to create interactive web applications. It enables dynamic content updates and improving user experience.

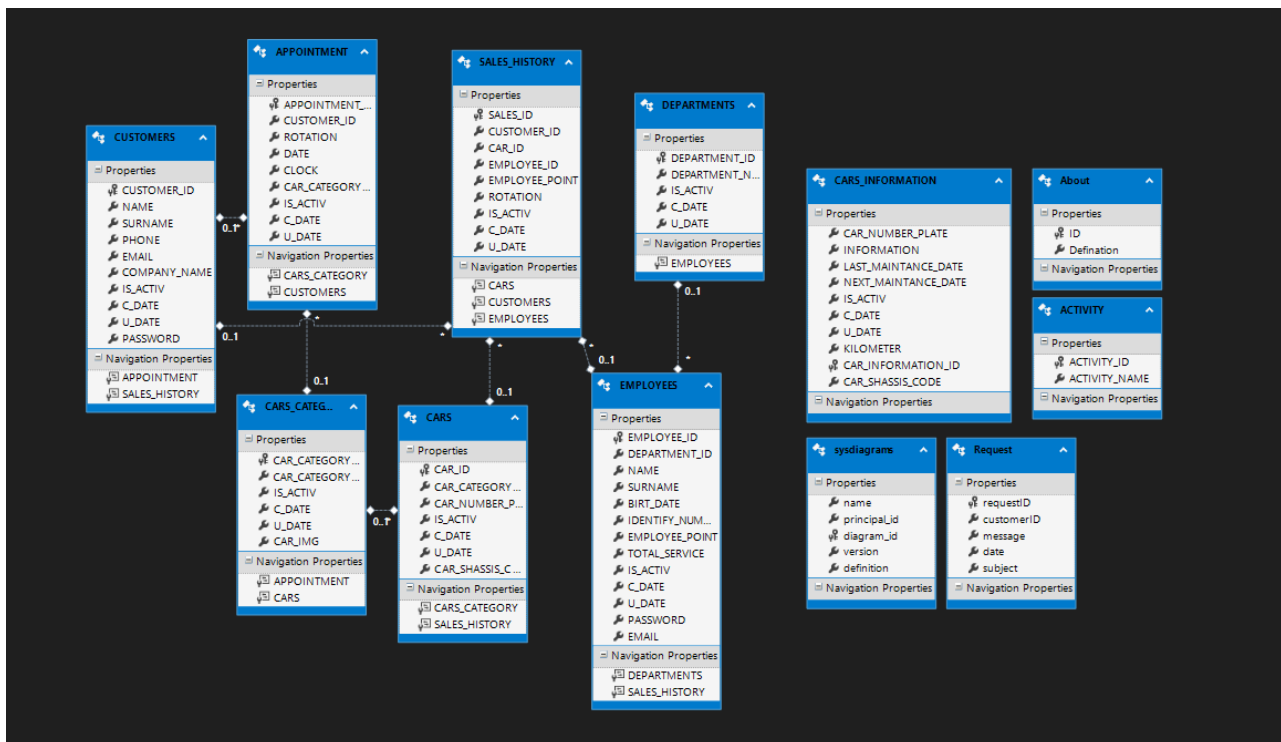
DIAGRAMS

ER Diagram

An Entity-Relationship Diagram (ERD) is a visual representation used in database design to model the structure and relationships of entities within a database. It consists of entities (objects or concepts), attributes (properties of entities), and relationships (associations between entities).

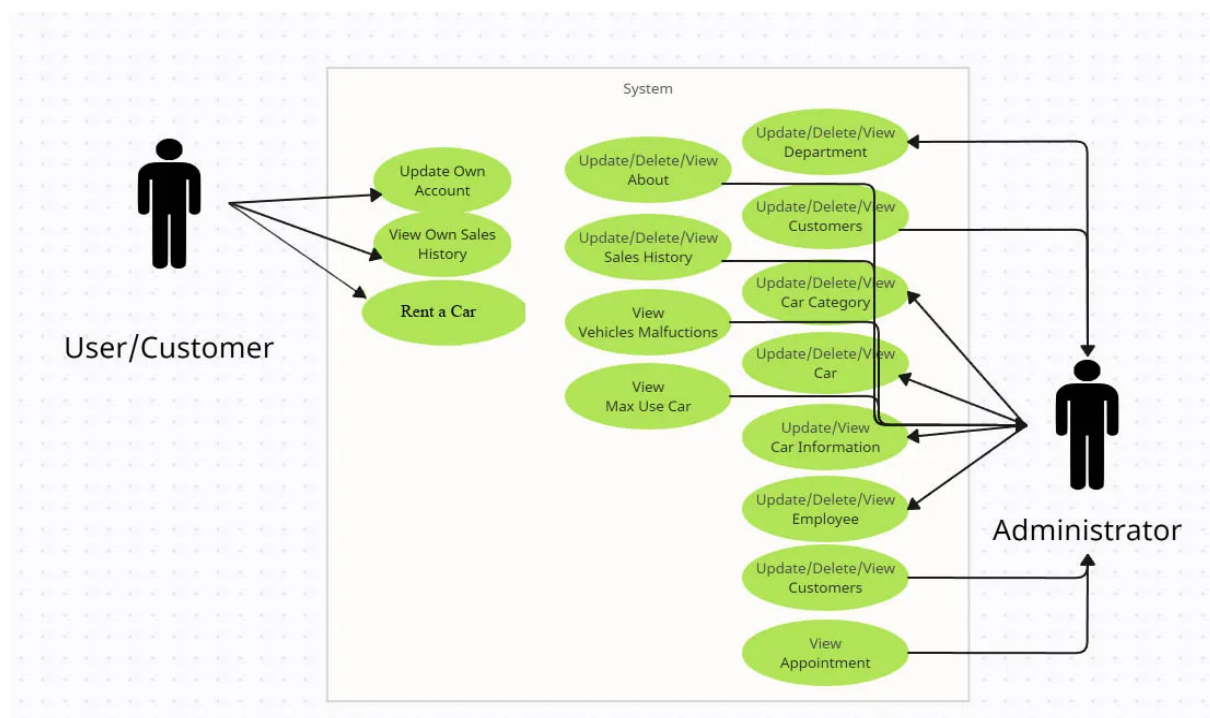


Database Model

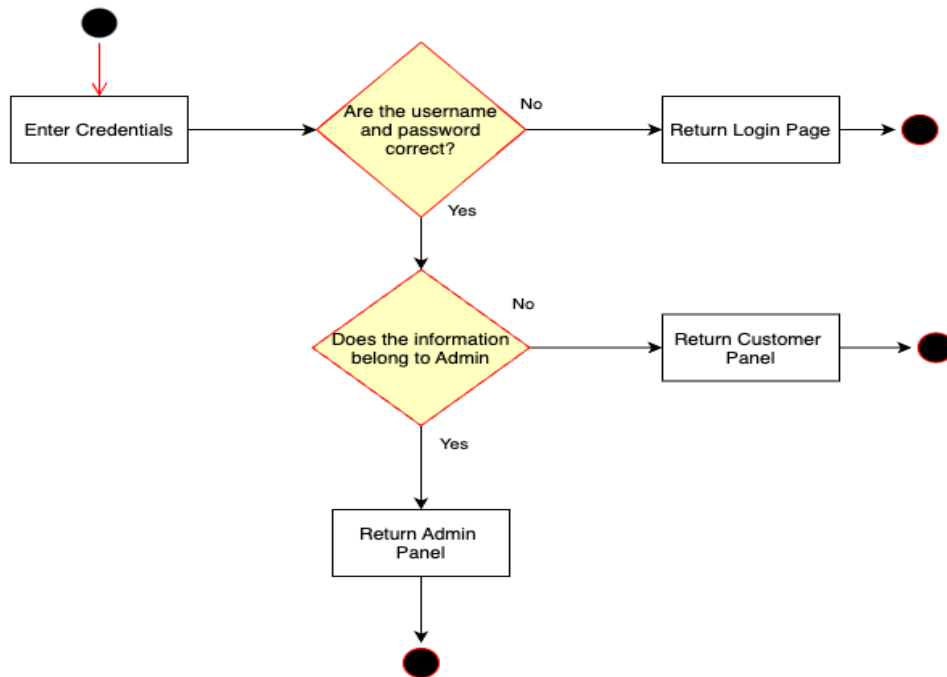


Use Case Diagram

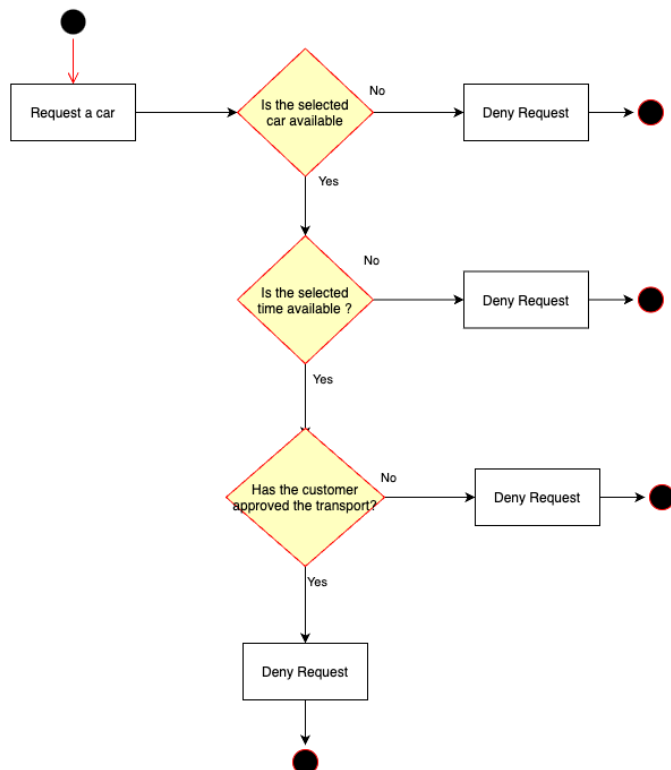
Use case diagrams are a type of visual representation used in software and systems engineering to display the functionality of a system from an end-user perspective.



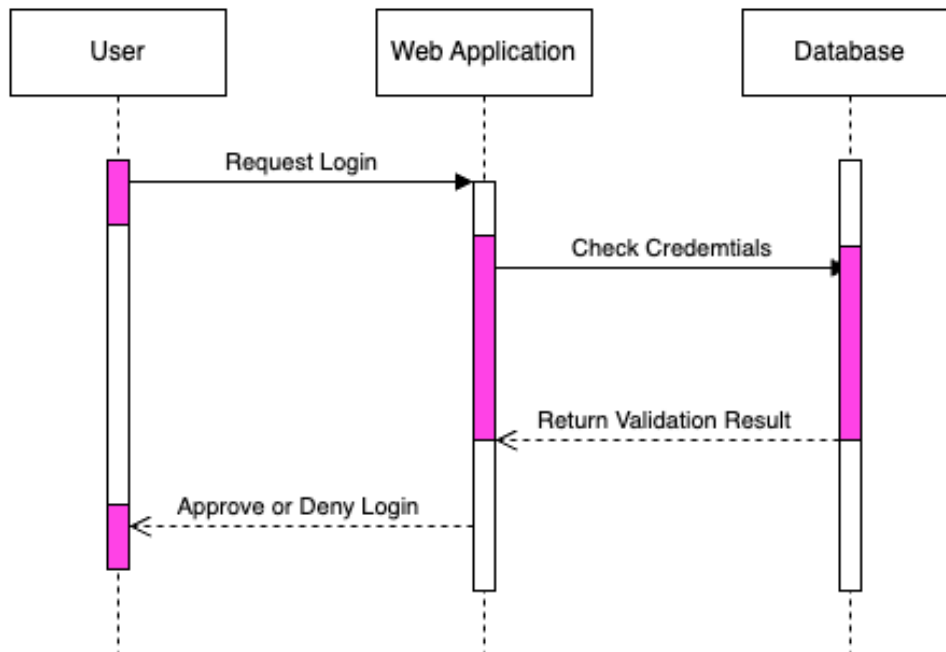
Activity Diagram for Login



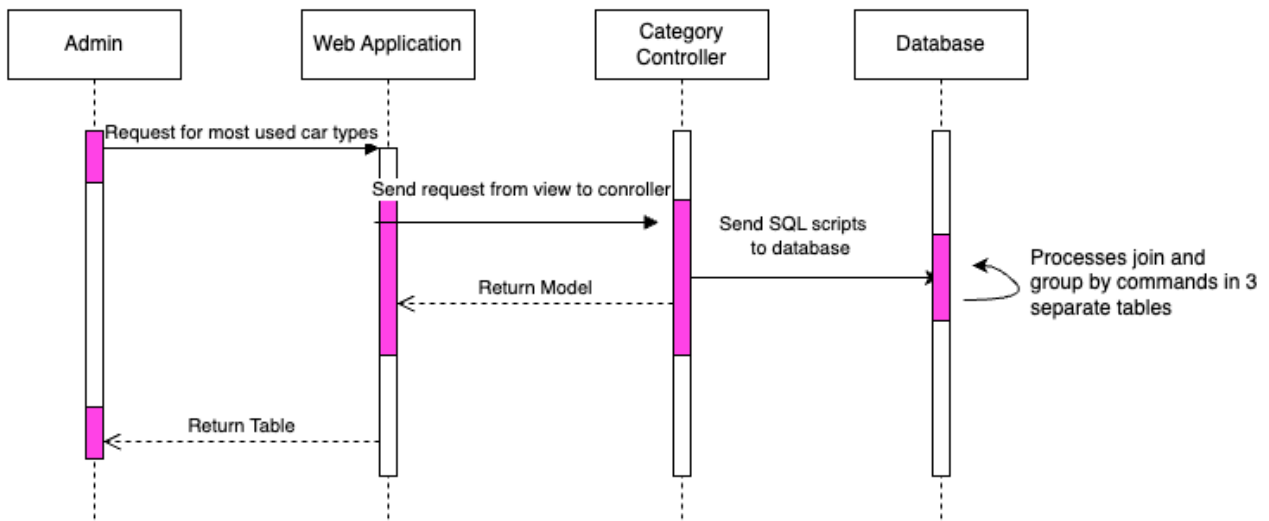
Activity Diagram for Car Request



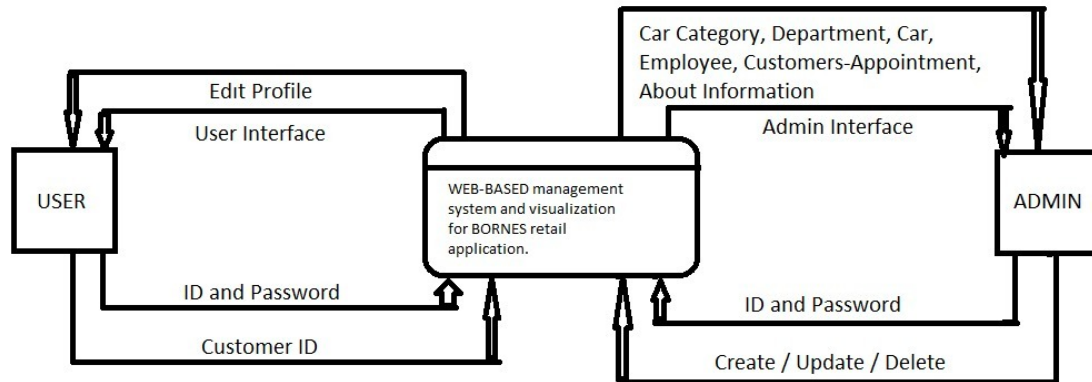
Sequence Diagram for Login



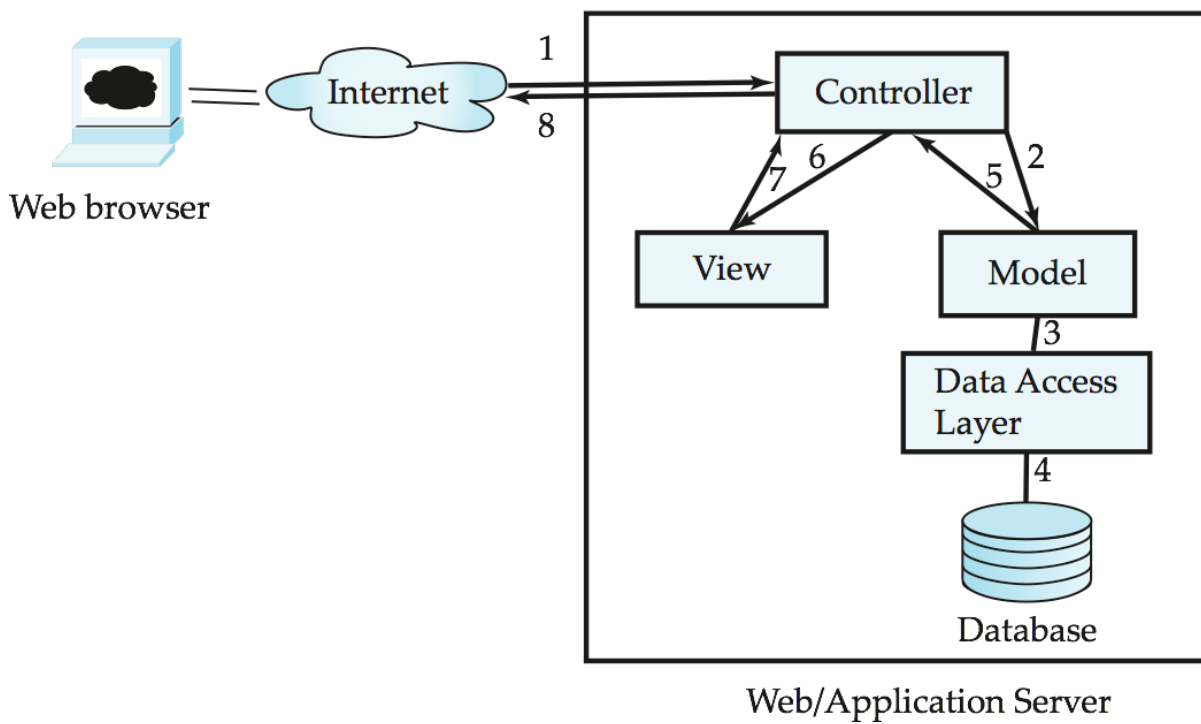
Sequence Diagram for Most Used Car Types



Data Flow Diagram

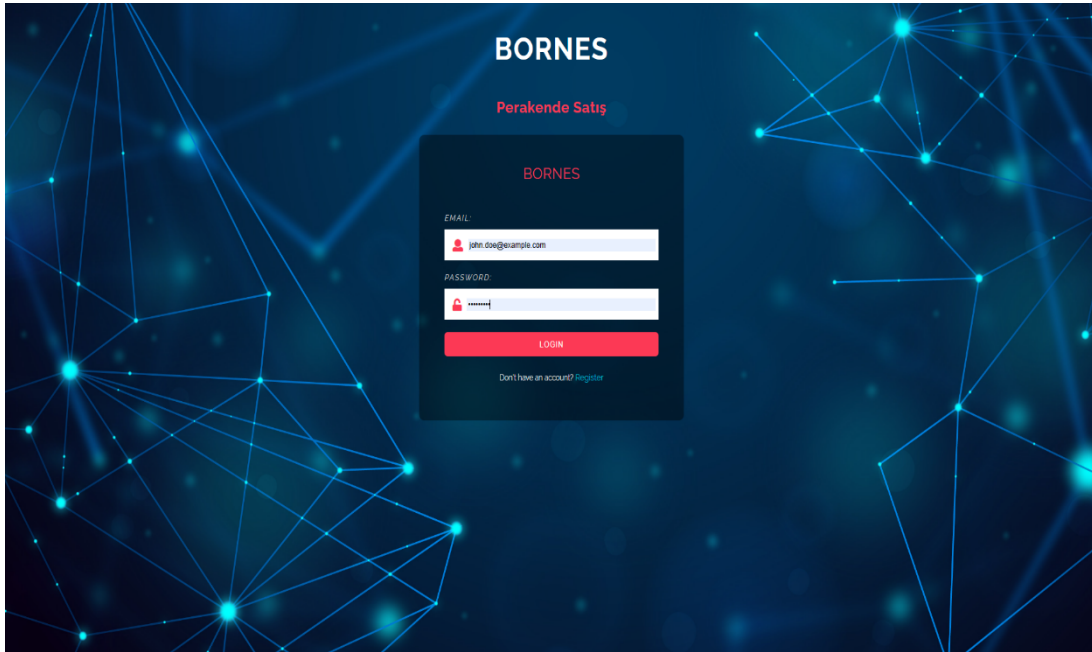


Application Design Diagram



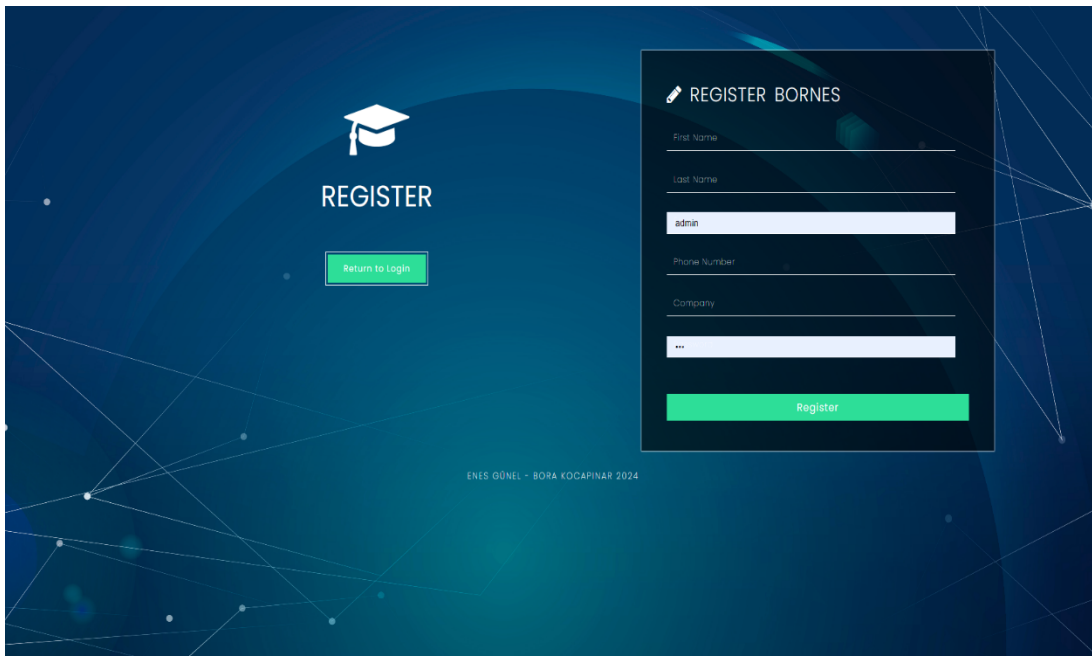
Screenshots

Login Page



The screenshot shows the login page for BORNES. The background is a dark blue with a network of glowing blue lines and dots. The BORNES logo is at the top center, with the text "Perakende Satış" below it. The login form is a dark blue box with the BORNES logo at the top. It contains fields for "EMAIL:" and "PASSWORD:", both with red icons. The email field contains "john.doe@example.com". Below the password field is a red "LOGIN" button. At the bottom of the form, there is a link that says "Don't have an account? Register".

Register Page



The screenshot shows the register page for BORNES. The background is a dark blue with a network of glowing blue lines and dots. The BORNES logo is at the top center, with the text "REGISTER" below it. Below the logo is a green button that says "Return to Login". The register form is a dark blue box with the BORNES logo at the top. It contains fields for "First Name", "Last Name", "Phone Number", and "Company", all with red icons. The "Last Name" field contains "admin". Below the company field is a green "Register" button. At the bottom of the page, there is a small text that says "ENES GÜNEL - BORA KOÇPINAR 2024".

Sample User Web Pages

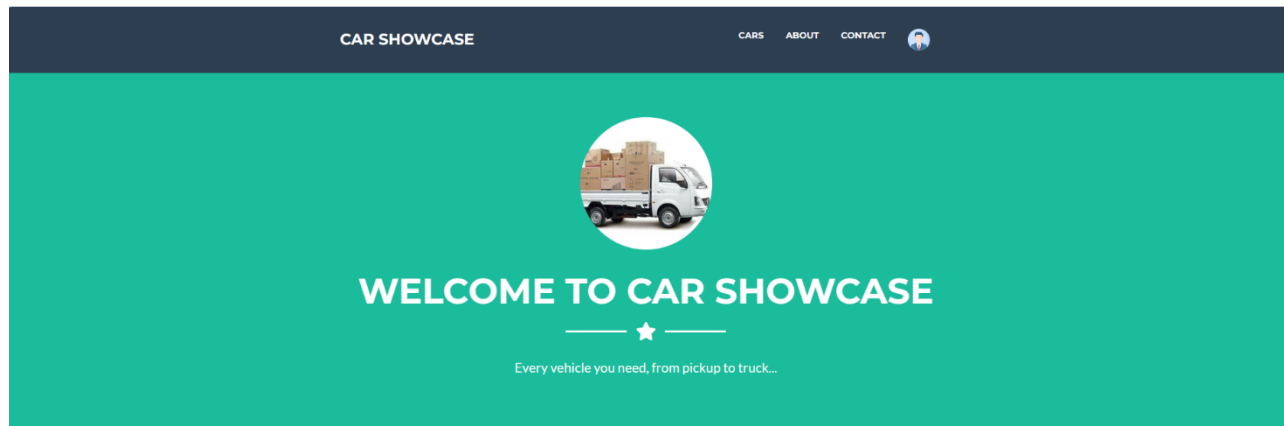


Figure 1:User first panel

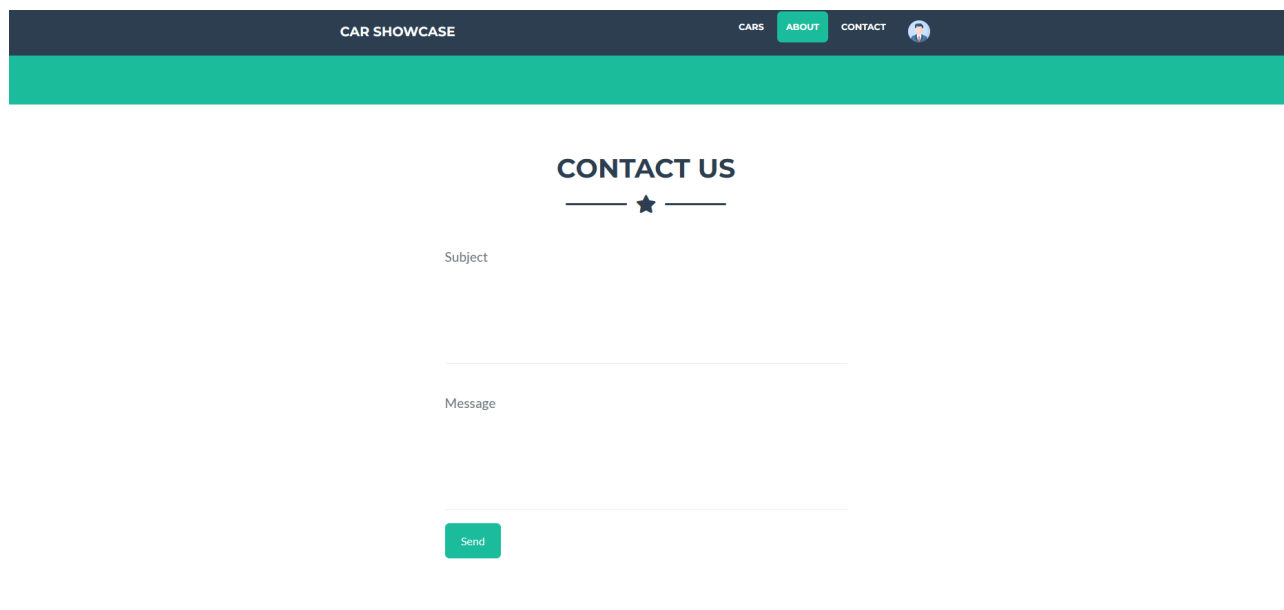


Figure 2:User contact panel

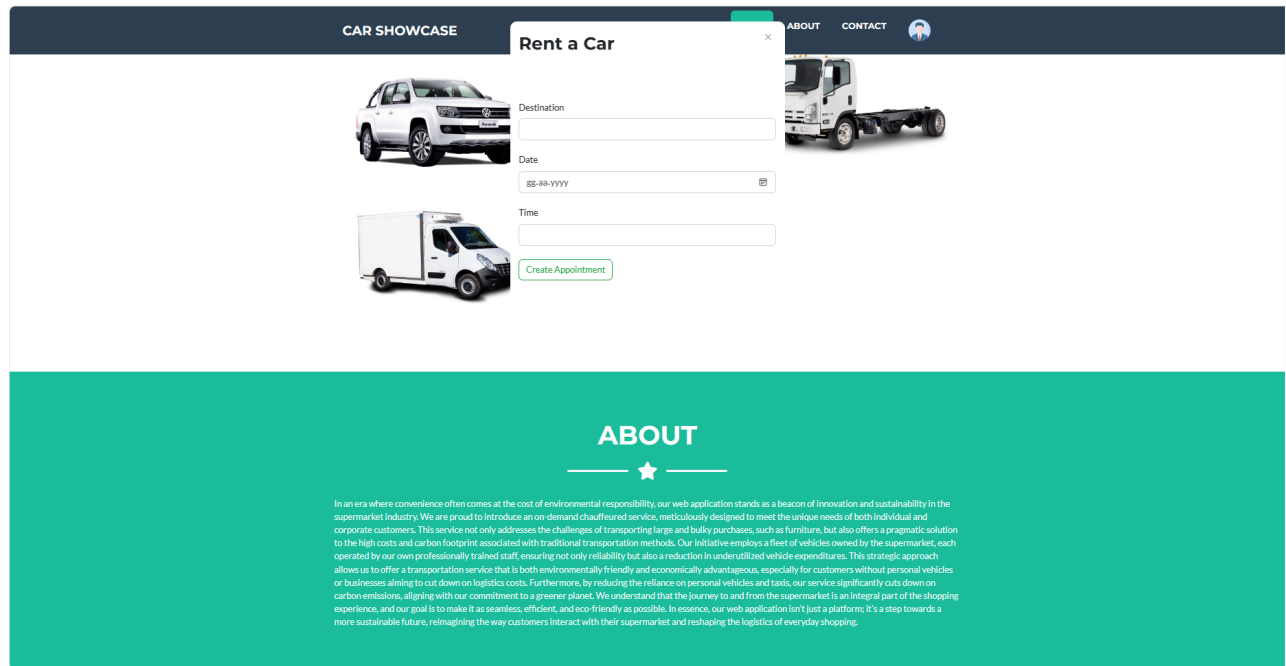


Figure 3: User create an appointment panel

Sample Admin Web Pages

Car Id	Category Name	Shassis Code	Number Plate	Activity	C_Date	U_Date	Delete	Update
14	Pickup	SH123456	34 ABC 123	1	01.12.2023	01.01.0001	Delete	Update
15	Van	SH987654	34 XYZ 789	1	02.12.2023	01.01.0001	Delete	Update
16	Sasi	SH654321	34 DEF 456	1	03.12.2023	01.01.0001	Delete	Update
17	Pickup	SH789456	34 GHI 789	1	04.12.2023	01.01.0001	Delete	Update
18	Van	SH012345	35 JKL 012	1	05.12.2023	01.01.0001	Delete	Update
19	Sasi	SH345678	35 MNO 345	1	06.12.2023	01.01.0001	Delete	Update
20	Mini Truck	SH678901	35 PQR 678	1	07.12.2023	01.01.0001	Delete	Update
21	Van	SH901234	07 STU 901	1	08.12.2023	01.01.0001	Delete	Update
22	Sasi	SH234567	07 VWX 234	1	09.12.2023	01.01.0001	Delete	Update
23	Pickup	SH567890	55 YZA 567	1	10.12.2023	01.01.0001	Delete	Update
24	Van	SH890123	29 BCD 890	1	11.12.2023	01.01.0001	Delete	Update
25	Mini Truck	SH123678	29 EFG 123	1	12.12.2023	01.01.0001	Delete	Update
26	Truck	SH456789	29 HIJ 456	1	13.12.2023	01.01.0001	Delete	Update
27	Van	SH789012	33 KLM 789	1	14.12.2023	01.01.0001	Delete	Update
28	Sasi	SH012345	21 NOP 012	1	15.12.2023	01.01.0001	Delete	Update
29	Truck	SH345678	22 QRS 345	1	16.12.2023	01.01.0001	Delete	Update
30	Sasi	SH678901	81 TUV 678	1	17.12.2023	01.01.0001	Delete	Update
31	Sasi	SH012345	77 WXY 2012	1	18.12.2023	01.01.0001	Delete	Update

Figure 4: Sample admin search panel

- Car Category
- Department
- Car
- Car Information
- Employee
- Customers
- Appointment
- About
- Sales History
- Vehicles Malfunctions
- Max Use Car
- Çıkış

CARS

Number Plate:

Car Id	Category Name	Shassis Code	Number Plate	Activity	C_Date	U_Date	Delete	Update
24	Van	SH890123	29 BCD 890	1	11.12.2023	01.01.0001	<input type="button" value="Delete"/>	<input type="button" value="Update"/>
25	Mini Truck	SH123678	29 EFG 123	1	12.12.2023	01.01.0001	<input type="button" value="Delete"/>	<input type="button" value="Update"/>
26	Truck	SH456789	29 HIJ 456	1	13.12.2023	01.01.0001	<input type="button" value="Delete"/>	<input type="button" value="Update"/>
33	Van	SH987654	29 YZ 789	1	20.12.2023	01.01.0001	<input type="button" value="Delete"/>	<input type="button" value="Update"/>

Figure 5:Sample admin search panel

- Car Category
- Department
- Car
- Car Information
- Employee
- Customers
- Appointment
- About
- Sales History
- Vehicles Malfunctions
- Max Use Car
- Çıkış

Car Category Id

Pickup

Shassis Code

Shassis Code should not be empty

Number Plate

Number Plate should not be empty

Activity

Activity should not be empty

DATE

2.01.2024

Figure 6:Sample admin create panel

- Car Category
- Department
- Car
- Car Information
- Employee
- Customers
- Appointment
- About
- Sales History
- Vehicles Malfunctions
- Max Use Car
- Çıkış

Vehicles Malfunctions

Number Plate	Last Maintenance Date	Next Maintenance Date
34 ABC 123	15.11.2022	15.05.2023
29 EFG 123	28.11.2022	28.05.2023
29 HIJ 456	02.12.2022	02.06.2023
22 QRS 345	12.11.2022	12.05.2023
77 WXYZ 012	24.11.2022	24.05.2023

Figure 7:Sample complex query result screen

Conclusion

In conclusion, the project was completed on schedule, achieving all the intended objectives. This outcome highlights the effectiveness of teamwork and strict adherence to the planned framework. As a two-person developer team, we successfully managed various aspects of the project, reflecting the efficiency of coordinated effort. The completion of this project also provided an opportunity for skill enhancement and professional development. Overall, the experience demonstrated the importance of collaboration and structured planning in achieving targeted goals.