Requirement Document

1.Introduction

1.1 Purpose

The aim of this system is to enable Adnan Ziyagil to generate revenue by leasing the buses he owns, while optimizing operational processes and preventing financial losses. Thus, the leasing processes will become more transparent and Mr. Adnan will be able to generate revenue in the most efficient way.

1.2 Scope

This project provides a management system covering bus leasing processes, route management and financial calculations. The system includes technical and financial tracking of the buses, contracts with lessee companies and trip-based revenue and expense calculations. Adnan Ziyagil will have full control over the condition of the buses, leasing transactions and financial records. Leasing companies will be able to select suitable buses and manage their routes, while passengers will be able to view route information and purchase tickets. In addition, the system will provide data protection through security measures.

1.3 Case

Adnan Ziyagil plans to generate income by renting the buses he owns to different companies. However, since he values his buses very much, he wants to create a system where he can track the status of each vehicle in detail. In this system, critical information such as license plate number, model, seat layout, passenger capacity, vehicle value, year of manufacture, mileage and average fuel consumption of each leased vehicle will be recorded. In addition, the availability of the vehicles will also be displayed in the system. Each bus will be assigned a unique identification number (ID) so that the vehicles can be easily tracked. Thus, thanks to this system, Mr. Adnan Bey will be able to see his revenue calculations from his buses more clearly.

Adnan Ziyagil wishes to establish regular and reliable communication with the companies to which he rents his buses. For this reason, an authorized person will be assigned for each company and communication will be ensured via phone or e-mail. The information of the companies will be recorded in the system. In addition, a trust score will be created to assess the reliability of the companies. All this information will be organized in a table and it will be easy to track which bus is rented to which company. Thanks to this system, Mr. Adnan Bey will be sure that he is working with reliable companies and will be able to carry out the rental process in a more controlled manner.

Each route will be identified only by its own unique ID. These routes will be created in such a way that they will depart from a given origin city and reach a given destination city. Route information will include basic details such as total distance and fare. In the future, the route data will be linked to the income statement so that the total revenue generated by each route can be tracked in the system.

The buses used on each trip will be stored in the system with a different vehicle ID. These buses belonging to Adnan Ziyagil will be leased to different transportation companies and operated. The company to which each vehicle is leased, the routes and the dates of each trip will be recorded in detail. The bus ID used during the journey will be matched with the route number so that it will be possible to track which vehicle is used for each trip. Route management will be carried out by the company renting the bus and the relevant company will be registered in the system with a unique identification number. Thus, it will be easy to track which routes each company operates and which buses they use.

A detailed revenue management process will be created for the companies by including the details of the flights performed by the companies in the revenue calculations in the following stages. Departure and arrival points, departure and arrival times for each trip will be recorded in the system. In addition, basic data such as the name, surname and contact information of passengers purchasing tickets will also be recorded in the system, so that passenger management will be carried out more effectively. The number of passengers carried on the route will be documented separately for each trip and this value will be multiplied by the ticket price to calculate the total revenue generated from the trip. The calculated revenue will be associated with the income statement and the revenue generated by each route will be analyzed in detail.

Company expenses are organized according to the criteria set to comprehensively calculate bus operating costs. Each charter contract and revenue record will be registered in the system with a different identification number. Thus, each expense item and earnings can be tracked based on the relevant contract and trip information. Companies pay a fixed monthly rental fee for each bus. In addition, for every 100 km traveled by the bus, a certain proportion of the sales price is calculated as an expense. This expense will vary depending on the intensity of use of the bus and the distance.

Expenses per trip will be calculated based on different variables. Expenses will be allocated as 2% of the ticket price per seat and 4% of the ticket price per ticket. In addition, companies will also bear personnel costs, such as the salaries of the driver and the coach driver. The fuel spent during the trip will be calculated based on the average fuel consumption of the bus, total distance traveled and current fuel prices. However, the fuel costs will be covered by the company and the bus owner will be paid after deducting this expense.

Maintenance and repair costs will also be included in the company's expense items and operational disruptions will be prevented by ensuring regular checks of the buses. Maintenance costs will be incurred in the periods determined for each bus, and when repairs and spare part replacements are required, these costs will also be calculated as expenses.

After deducting all these costs, the net profit of the company will be calculated and recorded. By analyzing the total income and expenses, the company will determine the net profit rates on a voyage basis and record this information on a date basis. Thus, the income-expense balance will be reported in detail and cost improvement will be achieved by recording the financial data of each trip. This system will allow both companies and bus owners to manage their finances in a more transparent manner.

Adnan Ziyagil wanted to have a clear picture of the monthly and per-trip fares in order to avoid losses and obtain the optimal revenue from the buses he leased. Based on past loss-making leases, it was found that there were significant problems such as the company's hourly calculation of the buses leased but agreed upon per trip; extra charges for the return of buses going to a distant location; the aging of the vehicles in terms of kilometers due to incomplete or incorrect mileage calculation between trips; buses that are not maintained at certain intervals incur more serious costs; and the company's efforts to lease the leased buses at the same price regardless of the number of seats or more luxurious buses.

Adnan Ziyagil, who wanted to avoid these and other problems and to see a clear income statement in front of him, was offered a solution of a bus subscription and a commission per trip in addition to renting. Based on this proposal, a detailed and non-loss-making contract was prepared. Prerequisites for all companies were firstly that the buses should not make more than one trip per day, that the companies should lease the buses for at least one month, and that maintenance should be carried out by the company, both after and just before delivery. Optionally, variables will be assigned according to some elements in the clauses in the contract and these elements will be subject to pricing.

According to the brand, model and mileage information of the rented vehicle, the monthly rental fee will be calculated in direct proportion. Buses rented on a monthly basis will also be charged extra per trip. The fees paid per trip will vary according to several different factors as follows: Regardless of whether or not a ticket is purchased on the actual trip, a percentage fee will be charged that is directly proportional to the number of seats available. Regardless of the seat fee, a percentage fee will also be charged for each ticket purchased, preventing Adnan Bey from making a loss.

In order to prevent cars aging in terms of kilometers, an extra allowance will be requested for every 100 kilometers traveled by the buses. The contract is designed so that all allowances are directly proportional to the value of the vehicle, number of seats, distance traveled and tickets sold, with some flexibility for companies with higher evaluation scores.

In order to ensure database security, certain IP addresses will be able to access this system. In this way, a security protocol will be established to limit the access of other users and to obtain permission from the main user. More critical measures will also be taken to protect sensitive data. Authentication and parameter binding methods will be used to avoid SQL injection. Connections will be encrypted with SSL and the database will be backed up regularly. Every user who accesses and wants to access the database will be listed and identified. Strong measures will be taken and encryption algorithms will be used.

1.4 Target Audience

- Software developers
- System architects
- Database administrator
- Test engineers

2. General Overview

The system will be accessable both a web application and a mobile application. It will provide an intuitive interface that allows the director to access all data, while enabling other users to access specific data and simplifying interactions between them.

3. User Roles and Permissions

User Type	Permissions
Admin(Adnan Ziyagil)	Has full authority over the entire system; can view buses, companies, routes, financial transactions, and user accounts.
Rental Firm Representative	Can rent buses, define routes, plan trips, and manage costs but cannot access other companies' data or modify system settings.
System Operators	Ensure system security, manage the database, and troubleshoot technical issues but cannot access financial and operational data.
Inspectors	Can view and update bus maintenance status, safety checks, and performance reports but cannot access financial transactions or rental agreements.
Company Accountants	Manage company income and expenses, trip-based earnings, and costs but cannot interfere with bus and route management operations.

4. Functional Requirements (FR)

No	Functional Requirements
FR-01	The system will store the license plate, model, seating arrangement, passenger capacity, vehicle value, year of manufacture, mileage and average fuel consumption information for each bus.
FR-02	The system will display the availability status of the buses in real-time.
FR-03	Users (Adnan Ziyagil and company consultants) will be able to view the financial and usage history of the buses.
FR-04	The system will store the contact information (name, phone, email) of authorized persons for each company.
FR-05	The system will automatically assign an identification number to each company.
FR-06	The system will generate a security score for each company.
FR-07	The system will track which bus is rented by which company and allow users to view this information in a table format.
FR-08	The system will maintain historical records of bus rental processes.
FR-09	Users will be able to edit and update company information.
FR-10	Each route must be identified by a unique identifier (ID).
FR-11	Each route must have information about the starting city and destination city.
FR-12	The total distance of each route must be recorded in the system.
FR-13	The ticket price for each route should be defined in the system and linked to the income statement in the future.
FR-14	The total revenue generated by each route must be trackable through the system.
FR-15	Each bus must be stored in the system with a unique identifier (ID).
FR-16	Buses should be able to be rented by different transportation companies.

FR-17	The company to which each bus is rented must be recorded in the system.
FR-18	The routes that each bus serves must be recorded in the system.
FR-19	The departure dates for each bus must be stored in the system.
FR-20	Each trip must be identified by a unique identifier (ID) in the system.
FR-21	The bus ID and route number must be matched for each trip.
FR-22	The departure point, destination point, departure time and arrival time of each trip must be recorded in the system.
FR-23	Trip management should be carried out by the company that rents the bus.
FR-24	Each transportation company must be identified by a unique identifier (ID) in the system.
FR-25	The routes operated by each company must be tracked in the system.
FR-26	The buses used by each company must be tracked in the system.
FR-27	The number of passengers transported on each trip must be recorded in the system.
FR-28	The calculated revenue must be stored in the system.
FR-29	The earnings from each trip must be linked to the income statement.
FR-30	The total revenue generated by each route must be analyzed in detail.
FR-31	Each rental contract and revenue record should be recorded in the system with a unique identifier and each expense item and revenue should be tracked according to the relevant contract and expedition information.
FR-32	Companies will pay a fixed monthly rental fee for each bus, calculated based on the selling price of the bus, which is determined by the make, model and mileage of the bus.
FR-33	For every 100 km the bus travels, a certain percentage of the sale price will be calculated as an expense.
FR-34	This percentage will vary based on the bus's usage intensity and the distance traveled.
FR-35	2% of the ticket price per seat and 4% of the ticket price per ticket will be calculated as expenses.
FR-36	Driver and assistant salaries will be paid by the companies.
FR-37	The fuel cost of the trip will be calculated based on the average fuel consumption of the bus, the total distance traveled and the current fuel price, and the fuel costs will be covered by the company and the payment will be made to the bus owner after deducting these costs.
FR-38	Maintenance and repair costs will be included in the company’s expense items.
FR-39	Repair and spare part replacement costs, when needed, will be calculated as expenses.
FR-40	After deducting all expenses, the company's net profit will be calculated, recorded and the company will determine the net profit margins for each expedition by analyzing the total income and expenses.
FR-41	All this information will be recorded on a date basis.
FR-42	The income-expense balance will be reported in detail.
FR-43	The financial data of each trip will be recorded to enable cost optimization.
FR-44	The system will allow both companies and bus owners to manage their financial situations transparently.
FR-45	The fee per trip should be calculated in proportion to the number of seats the vehicle has and should be recorded in the system.
FR-46	The fare per trip should be calculated in proportion to the number of tickets sold or the ticket price, plus surcharges.

FR-47	An additional fee should be charged for every 100 km the vehicle travels.
FR-48	The chartered buses must make only one trip and all fuel and maintenance costs must be covered by the chartering company.
FR-49	The rental period must be a minimum of 1 month.
FR-50	Company evaluations should affect the rental fee.
FR-51	A trip history record should be kept for each vehicle.
FR-52	Each trip must have a rental ID associated with the rental transaction.
FR-53	Each trip must be associated with the bus used.
FR-54	The fees obtained from sold tickets for each trip should be recorded.
FR-55	The fares from tickets sold for each trip and the distance-based fare should be recorded.

5. Non-Functional Requirements

No	Non-Functional Requirements
NFR-01	Access to the system should be provided only from specified IP addresses.
NFR-02	Users data must be encrypted using AES-256.
NFR-03	Multi-factor authentication should be supported for authorization and identity verification.
NFR-04	The database should be automatically backed up and stored daily.
NFR-05	The user interface should be designed to be user-friendly for all levels of users.
NFR-06	Users should see understandable error messages when encountering any errors in the system.
NFR-07	The system should operate without performance degradation as the number of companies and buses increases.
NFR-08	The data will be stored in MySQL.
NFR-09	New features should be easily added.
NFR-10	Error and performance analysis should be possible.
NFR-11	During system updates, the functioning system should not be affected.
NFR-12	The system should work seamlessly on different operating systems (Windows, Linux, macOS).
NFR-13	Relational integrity should be maintained between bus, route, and company data.
NFR-14	Data should be updated concurrently (ACID support) to ensure consistency.

6. Constraints

No	Constraints
C-01	Ticket cancellation can be done 4 hours before the play.
C-02	Purchasing more than one seat can not be separate from each other
C-03	No changes to the performance script can be made less than 72 hours before the show.

7. Data Managment

Database:

- MySQL

Key Tables:

- Crew (id, name, surname, job, email, password)
- Plays (playid, sceneid, name, castid, scenario, dekorid, acts, price)
- Ticket (publicid, playid, purchase_date)
- Puplic (publicid, name, surname, email, password)

8. Risks

- **Integrity of game details being compromised**: If the backstage team changes data outside of their authorized scope, it could compromise the integrity of game details. Therefore, RBAC (Role-Based Access Control) will be used to ensure that each user only has access to the data they are authorized to view.
- **Ensuring data security**: AES-256 encryption will be used to ensure the security of all sensitive data.

9. Deliverables and Timeline

Deliverables	Timeline
Requirement analysis	2 weeks
UI/UX design	3 weeks
Database desing	2 weeks
Backend and apı development	5 weeks
Testing process	3 weeks
Deployment and maintenance	Ongoing