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UNIVERSITI TEKNIKAL MALAYSIA MELAKA

FAKULTI TEKNOLOGI MAKLUMAT DAN KOMUNIKASI

**WORKSHOP 1**

**REPORT**

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# CHAPTER I

# INTRODUCTION

1.1 Project Background

Car rental is a business service that rent vehicles for a short period of time for a fee. Car rental agencies mostly attracts customers that requires temporary transportation vehicle whether they are travelling or having their cars out of service at the moment. Car rental agency sometimes offer other various automobiles such as motorcycles, vans, or trucks that suits the market. Some of the notable car rental agencies in Malaysia are SOCAR and Moovby. These agencies are highly praised for their quick services, perfect for customers urgently in need of transportation vehicle.

Car Rental System aims to create a simple and user friendly system that allows car owners and users alike to find a car to rent or rent their own car for an income with an automated system that keeps track of the vehicles

**1.2 Problem Statement**

Rental car owners might find it difficult to reach an audience without a proper platform to advertise their rental cars. Plus, without an automated system a contract needs to be made between the owner and the consumer to sign a rent agreement which can be time consuming. Besides, it is a hassle to note and keep track of all the rented cars. Consumer might also find it difficult to find a rental car that suits their needs.

**1.3 Objective**

Car Rental System aims to create a simple system that allows users to find and rent a car and car owners to rent their own car for an income with an automated rental system that keeps track of the vehicles. The highlight of the goals to be achieved with this system are as follows:

1. To develop and design a vehicle rental system that suits the vehicle owners and renters need of automated system.

2. To assess the requirements of a rental system.

3. To make recommendations based on observations of the current vehicle rental system.

**1.4 Scope**

1. Module to be developed

- Login

Authorize login to owner or user account with username and password

- Renting

Vehicle owners can rent their cars by entering the vehicle details and naming the rent price. They can also see the list of their rented vehicles.

- Vehicle List

User can get a list of vehicles to choose to rent them and set the duration of the rent

- Vehicle returning

User can choose to return the rented car earlier than the agreed date. The cost will automatically be calculated based on the duration of the rent and display it for the user.

2. Target User

- Car owners

Car owners can easily rent their cars by registering it in the system and find consumers that are interested while earning an income.

- People that travels a lot without their own transportation

Travelers may need a temporary transportation if they are moving around a lot and might be tempted to rent a vehicle.

# CHAPTER II

# ANALYSIS OF PROBLEM

**2.1 Introduction**

Below discusses the problems that car rentals business are facing:

1. It is hard to reach an audience

Since this age of social distancing, car rentals are hard pressed to find customers even though automobiles renting market was surging. This is because car rental owners have no means to advertise to their potential customers.

2. Signing a contract can be time consuming

Car rental owner and customer needs to sign a contract for a rental so that the rental terms were understood by both parties, but this process often may take a while.

3. A hassle to keep track of rental cars

Car rental owners need to document and take note of their rentals so that business ran smoothly. These documents may accumulate overtime as more rentals were being made and can became harder to keep track of.

4. Difficult to find suitable cars

For customers, finding cars that fits their needs can take a while as they have to gather car rental owners and search through their catalogue of rentals.

**2.2 Structure Chart**

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**Figure 2.2 Structure Chart**

# CHAPTER III

# DESIGN

**3.1 Flow Chart**

Diagram

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Figure 3.1.1 Flow Chart main()

Diagram

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Figure 3.1.2 Flow Chart ownerLogin()

Diagram

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Figure 3.1.3 Flow Chart userLogin()

**Diagram

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Figure 3.1.4 Flow Chart ownerModule()

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Figure 3.1.5 Flow Chart userModule()

Diagram

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Figure 3.1.6 Flow Chart calculatePayment()

**3.2 ERD**

Graphical user interface, application, Teams

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Figure 3.2.1 Entity Relational Diagram

**3.3 Data Dictionary**

Table USER

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No | Name | DataType | Length | Key | Description | Mandatory (Yes/No) |
| 1 | User\_ID | Number | 10 | PK | A unique user identification | Yes |
| 2 | User\_Name | Character | 20 |  | Name of the user | Yes |
| 3 | User\_Pass | Character | 20 |  | Password of the user account | Yes |

Figure 3.3.1 Table User

Table OWNER

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No | Name | DataType | Length | Key | Description | Mandatory (Yes/No) |
| 1 | Own\_ID | Number | 10 | PK | A unique owner identification | Yes |
| 2 | Own\_Name | Character | 20 |  | Name of owner | Yes |
| 3 | Own\_Pass | Character | 20 |  | Password of owner account | Yes |

Figure 3.3.2 Table Owner

Table VEHICLE

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No | Name | DataType | Length | Key | Description | Mandatory (Yes/No) |
| 1 | V\_ID | Number | 10 | PK | A unique vehicle identification | Yes |
| 2 | Own\_ID | Number | 10 | FK | A foreign key of table OWNER | Yes |
| 3 | V\_Type | Character | 20 |  | Vehicle type | Yes |
| 4 | V\_Brand | Character | 20 |  | Vehicle brand | No |
| 5 | V\_PlateNum | Character | 20 |  | Vehicle plate number | No |
| 6 | V\_Price | Number | 10 |  | The price of the rental per day | Yes |
| 7 | V\_Status | Character | 20 |  | (available/unavailable) | No |

Figure 3.3.3 Table Vehicle

Table RENTED

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No | Name | DataType | Length | Key | Description | Mandatory (Yes/No) |
| 1 | R\_ID | Number | 10 | PK | A unique rental identification | Yes |
| 2 | V\_ID | Number | 10 | FK | A foreign key of table VEHICLE | Yes |
| 3 | User\_ID | Number | 10 | FK | A foreign key of table USER | Yes |
| 4 | R\_Date | Date |  |  | The date when the rental starts | No |
| 5 | R\_End | Date |  |  | The date when the rental ends | No |
| 6 | R\_Status | Character | 30 |  | (active/returned) | No |

Figure 3.3.4 Table Rented

Table RETURNED

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No | Name | DataType | Length | Key | Description | Mandatory (Yes/No) |
| 1 | Return\_ID | Number | 10 | PK | A unique rental returned identification | Yes |
| 2 | R\_ID | Number | 10 | FK | A foreign key of table RENTED | Yes |
| 3 | Return\_Date | Date |  |  | The date of rental returned/cancellation | No |
| 4 | Return\_Earn | Number | 10 |  | Calculated rent cost by day | No |

Figure 3.3.5 Table Returned

**3.4 Interface Design**

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Figure 3.4.1 Interface Design

# CHAPTER IV

# IMPLEMENTATION

**4.1 Introduction**

In order to implement the system using C++, various coding methods were used to fully construct the system’s features such as functions, selections, controls, and classes.

**4.2 Function**

Functions were used to cut the codes into small, readable chunks.

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Figure 4.2.1 Function

**4.3 Selection**

Selections were used in functions to simulate menu choices by allowing user to enter numbers.

Graphical user interface, text, application, email

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Figure 4.3.1 Selection

**4.4 Control**

Controls were used in functions in the form of do…while loop to simulate navigations between menus and input validations.

Graphical user interface, text, application, email

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Figure 4.4.1 Control

**4.5 Class**

Classes were used as objects to store and retrieve functions and data related to users and database. Such functions include user login and user features.

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Figure 4.5.1 Class

# CHAPTER VI

# PROJECT CONCLUSION

**5.1 Summary**

Overall, Car Rental System project ran smoothly throughout its development. All the features were successfully implemented.

**5.2 System Strengths and Weaknesses**

Car Rental System is very light meaning that it can run on any pc. Users can register in the system as owner or user for rent and rent out businesses. Also, the process of renting or renting out a vehicle is quick and efficient. The vehicles that are available to rent are listed in an organized table.

Since the system uses Command Line Interface (CLI), the user may have to go through multiple menus and navigations before reaching their desired function. It is also difficult to distinguish whether you are logged in as a user or owner.

**5.3 Suggestions for Improvements**

Since there are a lot of menus and navigation in the system, it can be improved by replacing the CLI with Graphical User Interface (GUI) to be more user friendly.

**5.4 Conclusion**

The system’s lightweight build made it accessible for many pc and fast in delivering its services although it could use an upgrade from CLI to GUI.