SCHOOL OF COMPUTING
SESSION 2019-2020
SEMESTER-I

COURSE NAME: SYSTEM ANALYSIS & DESIGN
COURSE CODE: SCSD 2613
SECTION: 05 (TEAM-6)

PROJECT PART : RCar System

Group Members

1. MUHAMMAD HAFIZUL BIN SHUKRAN(A18CS0142)
2.SITI NUR ATIKAH BINTI OMAR(A18CS0246)
3.MOHAMMAD RIDZWAN SYAH BIN IRWAN(A18CS0112)
4.NURUL ISMAT TANNI(A18CS4052)

SUBMITTED TO

DR HASLINA HASHIM
SENIOR LECTURER
UNIVERSITI TEKNOLOGI MALAYSIA

DATE OF SUBMISSION : 6th January, 2020

TABLE OF CONTENTS **PAGE no**

PART-1

(Project Proposal and Planning)

1. Introduction……...4
2. Background Study……...4
3. Problem Statement……..4-5
4. Proposed Solution……...5
5. Feasibility Study……...5
    - ❖ Operational Feasibility
    - ❖ Technical Feasibility
    - ❖ Economic Feasibility
6. Project's Objective……...6
    - ❖ General Objective
    - ❖ Specific Objectives

7.The Project's Scope…….6

8.Project Planning……...7-8

- ❖ Human Resources
- ❖ Work Breakdown Structure(WBS)
- ❖ Gantt Chart
- ❖ PERT Chart

9.Benefits……..8-9

10.Summary of the Project…….9

Meeting Log-1……..9

PART-2

(Information Gathering and Requirements)

2.0.**Information Gathering Process**……10

- ❖ Method Used……...10
- ❖ Example of questions……10

3.0 **Requirement Analysis**

- ❖ Current Business Process……...10
- ❖ Functional Requirement……10
- ❖ Data Flow Diagram
  - Context Diagram……..….11-12
  - Logical Diagram……...11-12

- ❖ Non-Functional Requirement……...13
  - Security
  - Performance
  - Availability

- ❖ Data Requirements……13-14
- ❖ Summary……14

Meeting Log-2……..15

PART-3

(Analysis and Design)

4.0. System Analysis and Specification

- Logical DFD of the To-Be system……16-17
- ERD……18
- Data Dictionary……18-19
- Process Specification……..20

5.0 System Design

- Physical DFD of the To-Be system……21-22
- Interface Design (GUI).....22-29

6.0 Summary of proposed system……..29

Meeting Log-3……...30

Introduction

RCar System is a system which applied the use of database system rather than the traditional file-based system. The Rcar system provide ease management of any car rent process for the company as well as for the user. This Car Rental System project also has been presenting with user identification based on non-manual online, deposit system, monitoring of car availability information, and so on. Because of online life, this system works 24/7. The system seeks to improve the overall operation of car renting and the user experience in car renting.This system can be used by the customer from anywhere and at any time.

Background Study

Ikram Motors Enterprise start in early 2018 with students as the main customer for the car rental. At that time, the company renting just two car, Perodua Viva and Proton Saga. The car renting was based on hours as the company just started. After a couple of months, the company receive some investment in terms of cars. The company then continue to grow larger as they open their operation towards public. More based-rent option such as day-based-rent and even month-based-rent developed, as the company being approached by more customer. Around at the end of 2018, the company become successful that even some of the company around Skudai using their car rent service.

Problem Statement

The Ikram Motors Enterprise has a rather successful company in the car renting business. There are still a lot of improvements and problem to conquer that can be made to ensure the company success in the future. The traditional method used by the company posed a lot of problem.In addition, the increase of customer for their service encourage this development of change of system.

The following are some of the problems of the current system used by Ikram Motors Enterprise :

1. Inefficient data management. The company store their customer data in file and picture of any document store in either WhatsApp storage. This method could cause any data loss unrecoverable but it's also slow the whole operation of car renting.

2. Car availability. The company has to physically check if any car available for rent or not when the customer want to rent a car. This takes more time as the number of the car the company owns increase.
3. Customer register and car reservation. The customer has to fill-up paper form to register as a tenant as well as when renting the car. There is no efficient way to make sure whether the customer already registered or not.

Proposed Solution

The use of database system to improve the overall system of car renting. This system can avoid the redundancy data of the customer. To avoid any loss of data of any important information of customer and company. Implement the function for car availability to quickly inform the user of the status of the car, featuring option such as the type or category of the car. The reservation system also can be made in online form or at the web based so at the same time this method can be reduced the use of paper.

Feasibility Study

Operational feasibility

The proposed system will use the database system and allow for easier use of the system and more user friendly. The new proposed system will decrease the time spend to record any operation as well as less data loss and will control the data redundancy . The system is acceptable for the user as it will help the car renting process that doesn't contact the company to know whether the car is available or not. Therefore, the proposed system is operationally feasible.

Technical feasibility

The system will use basic software and hardware as the development, implementation and development of the system required is very basic and common.

- Software available
    - Windows 7 and above
- Hardware available
    - 3.00 Megahertz Intel Pentium IV Processor
    - 5GB HDD space
    - 4 GB RAM

Economic feasibility

The economic feasibility depends on the financial aspects of the system. It conclude whether the investment on the systems is the correct decision. The cost benefits analysis is the method used to determine the economic feasibility of the systems.

Project's Objective

General Objective:

This project aims to develop a digital system RCar System for Ikram Motors Enterprise. The users are able to enter the company's website for searching or booking the cars easily through the internet and it can be accessed anywhere and anytime.Hence, the company is able to improve their customer satisfaction level,increasing efficiency the system by providing better services to the customer.

Specific Objectives:

This project specifically aims to:

1. Manage the data of car rent effectively
2. Change the record tracking system
3. Track the car rental information
4. Simplify user interface
5. Easier for the renting process

The Project's Scope

Scope of this project is to make a web based applications for R Car System company. This system will show the yearly and monthly car rental report.

The function that will be included in the systems are:

- Online car rent/ reservation
- Generate overall report of the system
- Display car information

The function that will not be included are:

- Advertising the company

- ❖ Car course tracking
- ❖ Car maintenance tips

PROJECT PLANNING

8.1 HUMAN RESOURCES

- Name: Hafizul

  Role: Director, Head of department

- Name: Ridzwan

  Role: System Developer , Programmer

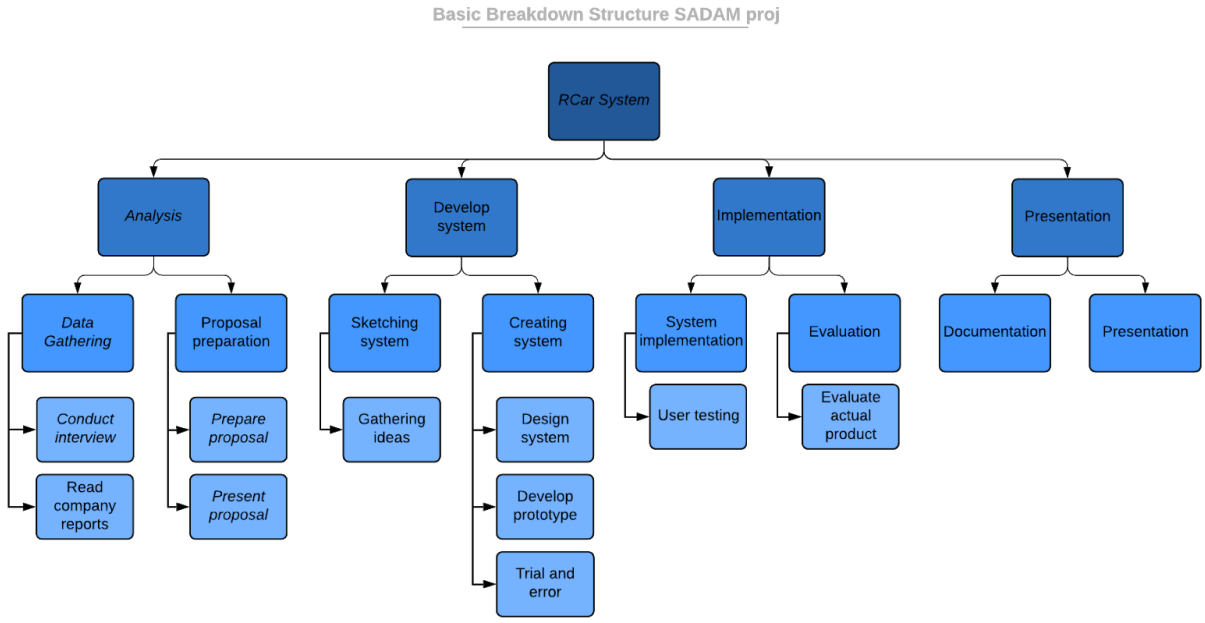
- Name: Ismat Tanni

  Role: System Analysts, Program Debugger

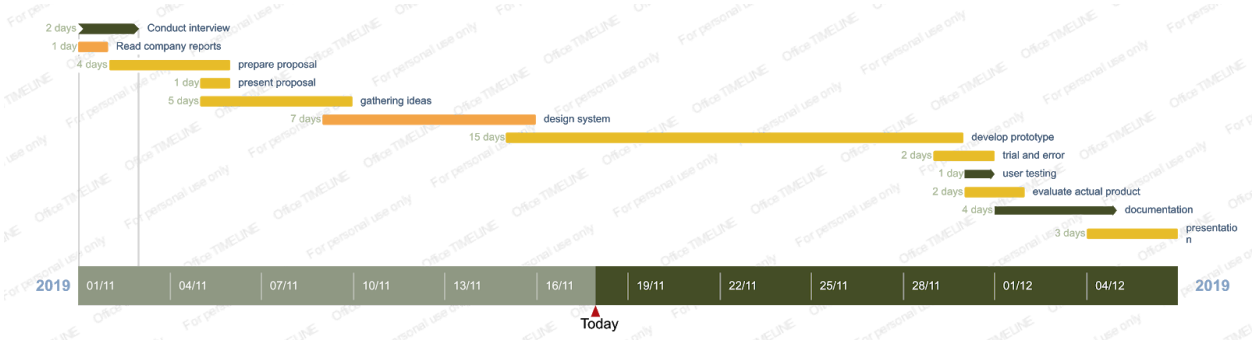
- Name: Siti Nur Atikah

  Role: Manager, Human Resources

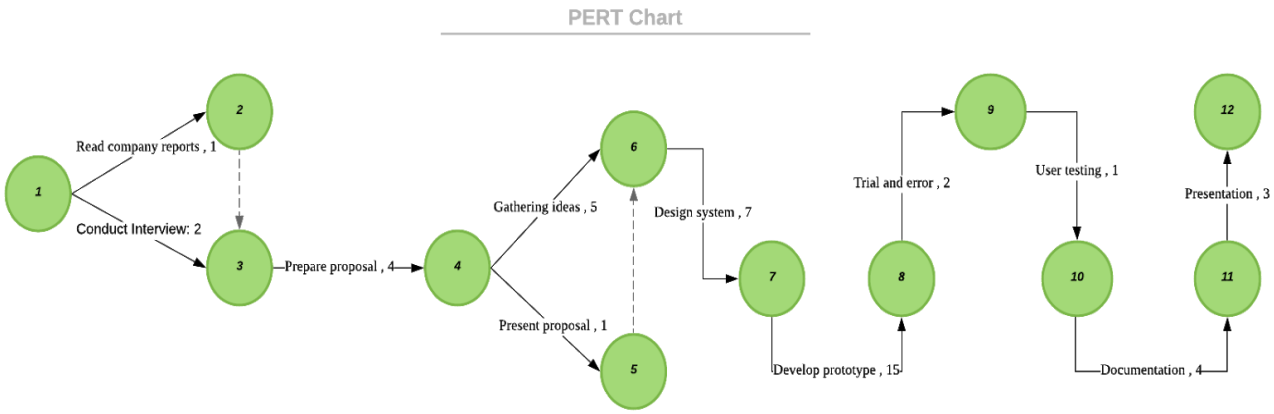
8.2 WBS



8.3 Gantt Chart



8.4 Pert diagram



Benefits

The RCar system expected to bring a lot of benefits as soon as it is implemented. The benefits are :

1. The operation of car renting become smoother and easier. The customer and the company able to exploit the system thoroughly.
2. The system reduces the time and cost for the customer for rent or reserve a car. Customer will be able to make a reservation or rental directly from the online system from anywhere and at anytime.
3. The system will be more secure than the old system. All of the customer's private information will be secure in the system and only available to the company and the customer itself.
4. Payment is easier and faster.
5. Customers can check the information and prices about all the cars available for rent.

Summary of the Project

In conclusion, the new system will be developed based on the current needs of today's world. As we know, nowadays we already facing an industrial revolution 4.0 where our system are managed by A.I or in other words the system itself. So, we have implemented this approach to build a web-based system for the car rental system. The function that will be in our system are online car rent/reservation, a system that will automatically make an overall report for the system and it will be able to display all of the available car information.

Meeting Log 1

Date **:** 13 November 2019

Time **:** 2.30 PM – 3.30 PM

Location **:** N28A

Present: Muhammad Hafizul bin Shukran, Siti Nur Atikah binti Omar, Mohammad Ridzwan Syah bin Irwan, Nurul Ismat Tanni

Absent: None

Meeting Title: Project (Part 1) Discussion

Agenda :

1. The briefing of the project
2. Discussion about the tasks for part 1 of the project based on the guidelines provided
    a. The problem of the current system
    b. The proposed solution of the problem stated
    c. The objective and scope of the project
3. The work distribution among the team member

Adjournment:

The meeting was adjourned by Muhammad Hafizul and the next meeting willl be held on 25 November 2019 at N28a.

Minutes submitted by : Mohammad Ridzwan Syah bin Irwan

Minutes approved by : Muhammad Hafizul bin Shukran

Part 2: Requirement Analysis

2.0 Information Gathering Process
2.1 Method Used

The method used to gather the information is interview. Interview method provides a lot of flexibility in terms of time conducted, type of question, and the structure of the question. In the interview with the company, the question type used was open-ended questions and closed-ended question.

2.2 Example of questions :

1. Generally, how your system work?
2. What are your company's goals?
3. What are generally the problem that you faced in the system?

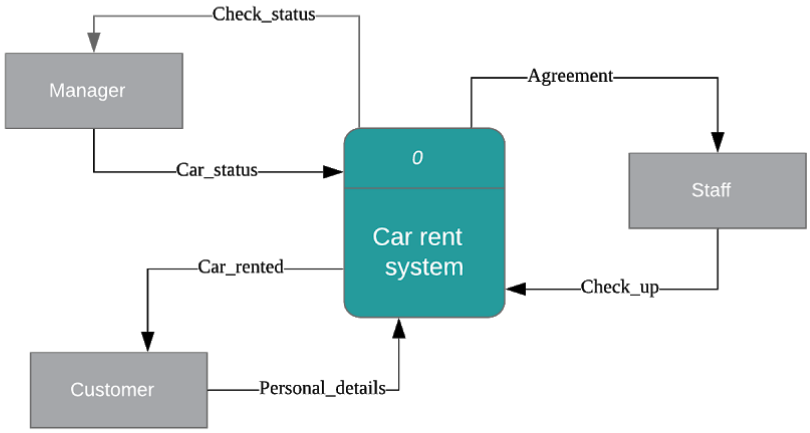
3.0 Requirement Analysis
3.1 Current Business Flow

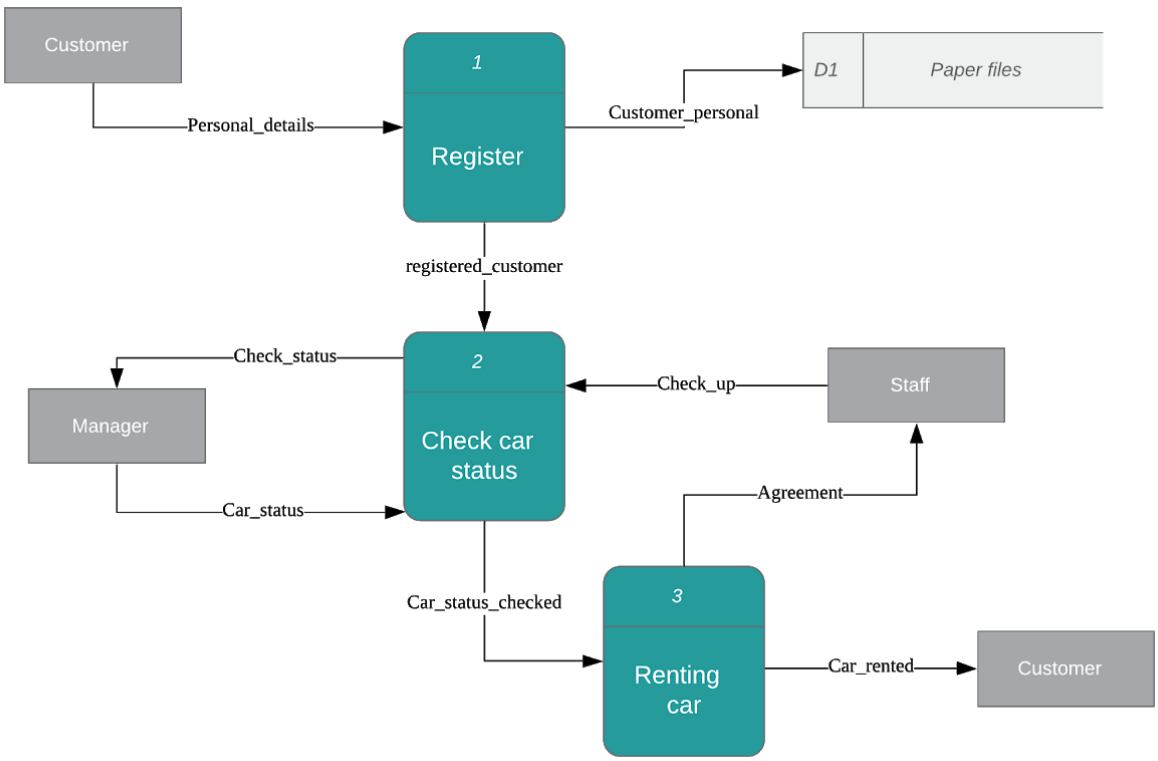
The renting car process of Ikram Motors Enterprise start with the customer contacting the company through WhatsApp. The company then proceed by listing all the car and the price of rent for each car, in day or half-day rate. The customer choose the car that they want and the amount of time they want to rent it for. Next, they were asked to send their details such as name, occupation, the purpose of renting the car, the time for them to pick-up and return the car. After both parties reach an agreement and the customer has read all the terms & conditions, the customer asked to settle the payment. Upon pick-up the car, the customer then need to bring copies of their Identification Card (IC), driving license, student card if they are a student or employee card to ensure their status and identity. The car receive a checkup before handed to the customer to ensure them of any damage on the car before and the cleanliness of the car that they have to kept. Picture of the car and the customer were taken as a proof and also for advertisement of the company. The customer can always contact the company for any feedback and report on the car. The car getting a checkup when the customer return the car to the company.

3.2 Functional Requirement

Input - customer details
Process - register, car renting, check car status
Output -
DFD

Data Flow Diagram (Logical)





3.3 Non-Functional Requirement

Security

1) Provide a high level of security and integrity of the data that is held in the system.
2) Verify the website security.
3) Prevent false information from being used as payment

Performance

1) Speedy the performances / transmission data.
2) Send any email immediately
3) Display the accurate information of the availability of the car

Availability

1) The system is available and can be accessed 24 hours, 7 days a week.
2) The system will available 1 to 2 working days, so that business process has not adversely affected.

3.4 Data Requirement

Entity	Data Store	Requirement Data
Customer	1.Name 2.Customer Id 3.No IC/no passport 4.Age 5. License 6.No Matric Card 7.No Phone	❖ [3.] No IC, a copy of no IC needed. ❖ [3.] No Passport, a copy of no passport if you a foreigner ❖ [5.] License, a copy of license needed. ❖ [6.] No matric Card, a copy of matric card needed if you are a student.
Staff	1.Name 2.Staff Id 3.No IC 4.No Phone	❖ [2] Staff Id, to ensure that you are staff at the company
Car	1.Car Id 2.Name of cars 3.Type of Car i)Colour ii)Brand of the Cars iii)No Plate of the Cars 4.Availability of the cars 5.Price	❖ [3] Type of car, you can decide the type of car that they want to rent. ❖ [5]Price, based on the cars and the duration they want to rent.

Payment	1.Payment Id i) Cash ii) Bank-in 2.Date of Payment 3.Payment Method 4.Payment Status	❖ [1]Payment Method, a copy of receipt if you pay through bank in.
Order	1.Order Id(PK) 2.Duration i) Hour ii) Day iii) Month 3.Destination	❖ [2] Duration,there has a minimum time for customer to rent

3.5 Summary

The implementation process has helped us to develop a basic understanding of our website, identify the people that will benefit if our website is successful, describe the scope of our website and establish initial contact with our participants.

Meeting Log 2

Date **:** 26 November 2019

Time **:** 1.15 PM – 2.15 PM

Location **:** N28A

Present: Muhammad Hafizul bin Shukran, Siti Nur Atikah binti Omar, Mohammad Ridzwan Syah bin Irwan, Nurul Ismat Tanni

Absent: None

Meeting Title: Project (Part 2) Discussion

Agenda :

1. Discuss about P2 (in P2 Guideline)
    a. Deciding the method to gather the information and make some questions that we want to with the owner company of the rental car.
    b. How the work flow of the current system and what needs to update the system after interview session with the owner company.
    c. Sketch how DFD will look like based on the current system.

2. Contribute the task for the team member.

Adjournment:

The meeting was adjourned by Muhammad Hafizul and the next meeting willl be held on later date

Minutes submitted by : Nurul Ismat Tanni

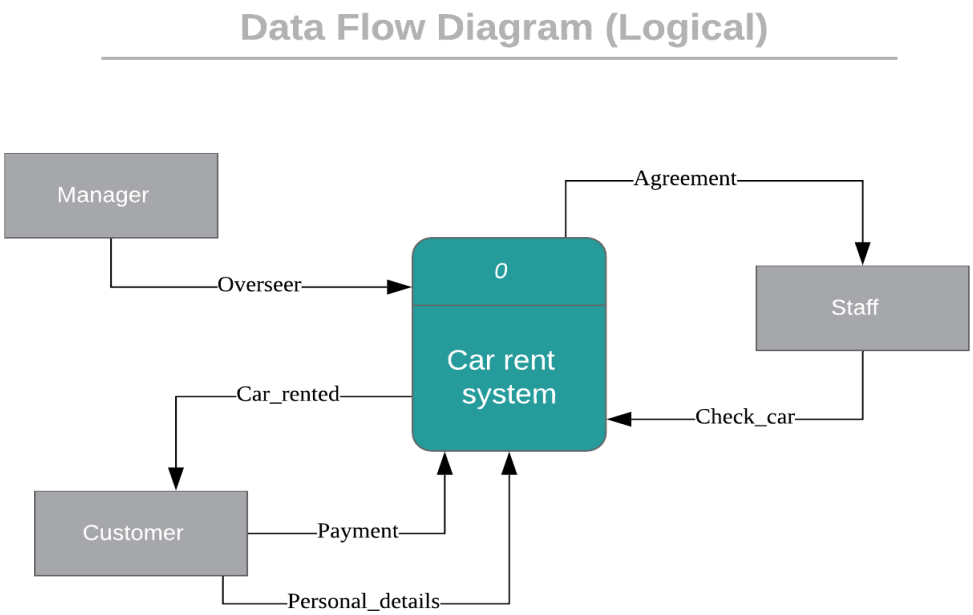
Minutes approved by : Muhammad Hafizul bin Shukran

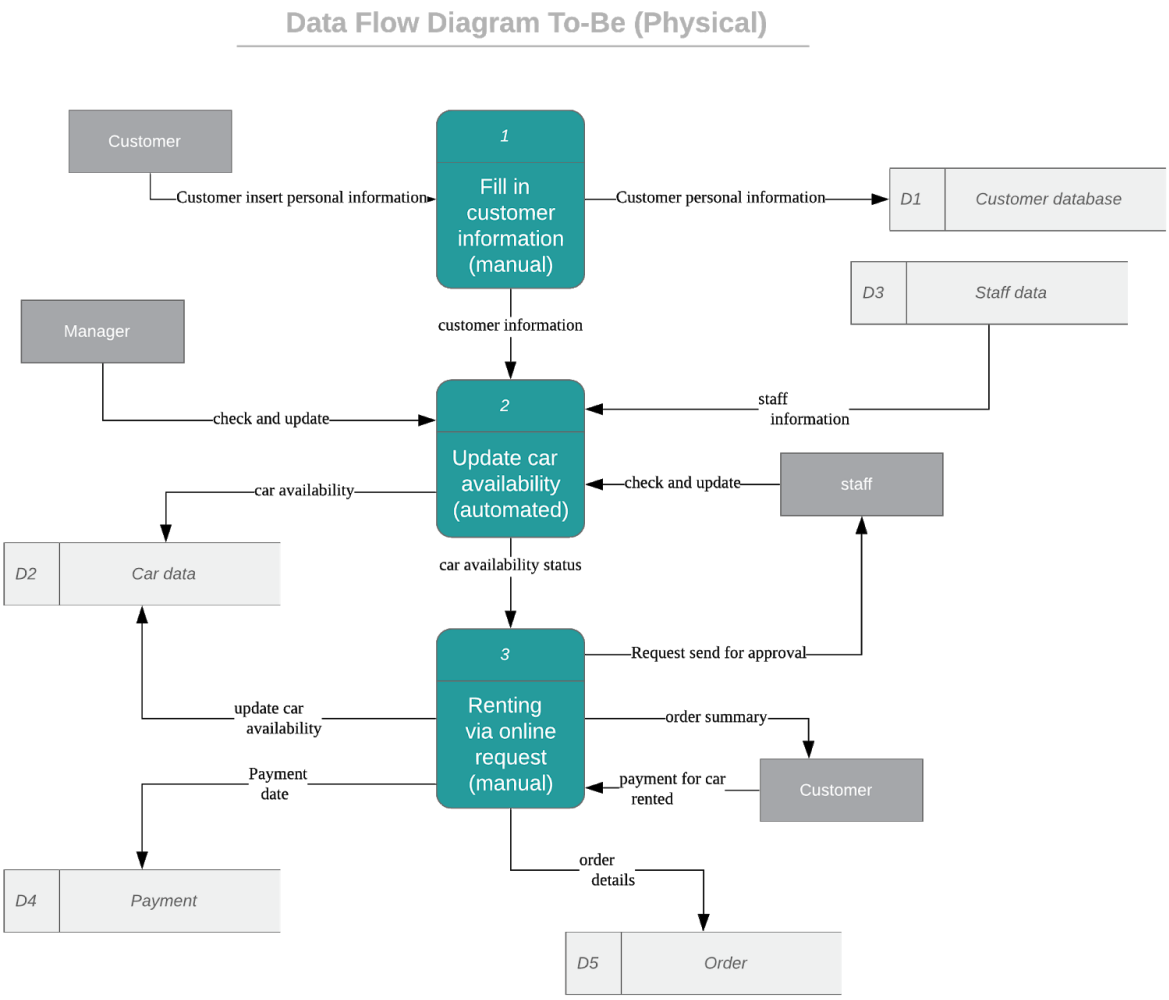
Part 3: Analysis and Design

4.0 System Analysis and Specification

4.1 Logical DFD of the To-Be system

DFD to-be

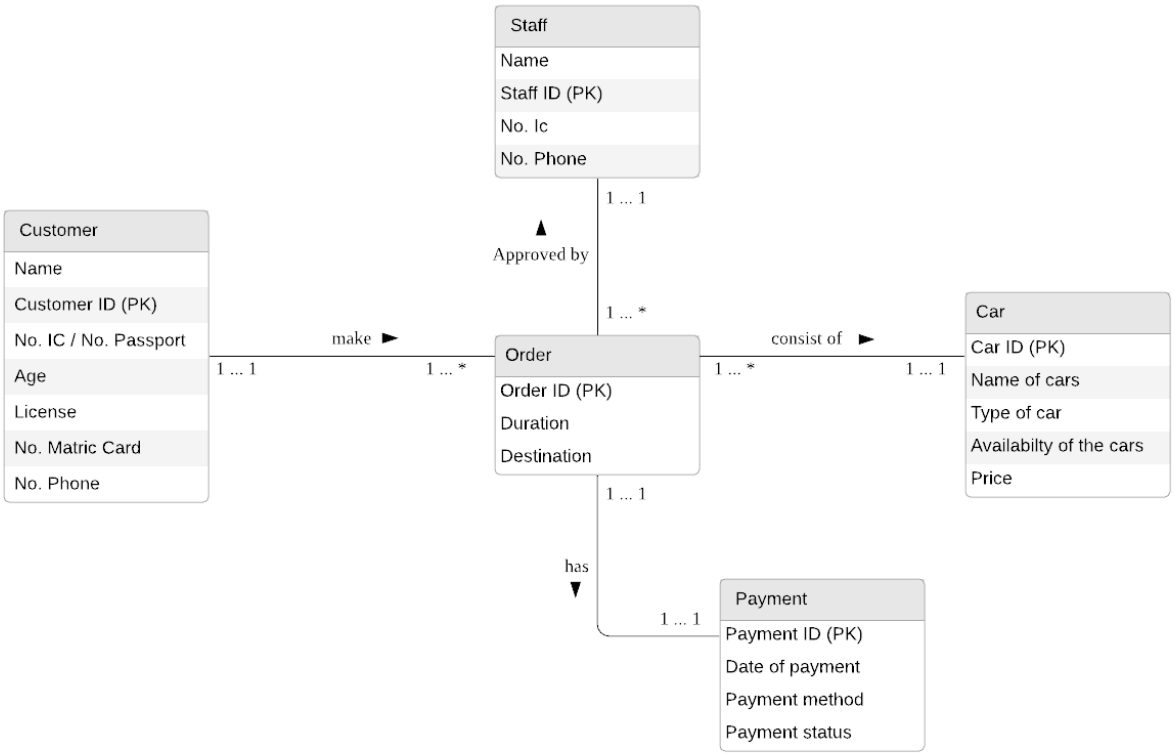




4.2 ERD (based from 5.1)

Basic Entity Relationship Diagram (UML Notation)

lolpijo8 | December 13, 2019



4.3 Data Dictionary(based from 5.2)

ENTITY NAME	ENTITY DESCRIPTION	COLUMN NAME	COLUMN DESCRIPTION	DATA TYPE	SIZE	PRIMARY KEY
CUSTOMER	Customer is someone who wants to rent a car	Name	Customer full name	Varchar	50	×
		Customer ID	System will assign the customer ID	Number	30	✓
		No IC/passport	Exact identification number	Number	30	×
		Age	Customer age	Date		×
		License	Driving license of customer	Number	30	×
		No matric card	If he/she will be UTM student	Varchar	10	×
		No phone	Contract number of customer	Number	15	×

STAFF	Staff who work in this company	Name	Staff name	Varchar	50	×
		Staff ID	Staff identification number	Number	30	✓
		No Phone	Contract number of staff	Number	15	×
CAR	Car is a vehicle that is rent customers via company	Car ID	Car exact identification number	Number	30	✓
		Name of car	Car name which companie's car	Varchar	30	×
		Type of car	The car which color, which brand and also number plate include	Varchar and number	15	×
ORDER	According to customer	Order ID	Order identification number	Number	30	✓
		Duration	How many times he/she will be use(hour,day,month)	Date		×
		Destination	Where he/she wants to go	Varchar	50	×
PAYMENT	Customer pay to Company	Payment ID	Customer have payment ID	Number	10	✓
		Date of payment	When he/she wants to pay	Date		×
		Payment Method	How can he pay	Number	10	×
		Pay Status	What is his/her payment status	Varchar	15	×

4.4 Process Specification(from processes in 5.1)

Process Specification Form

Name : Renting Car
Description : Process of renting car using the website

Input Data Flow :

Output Data Flow :

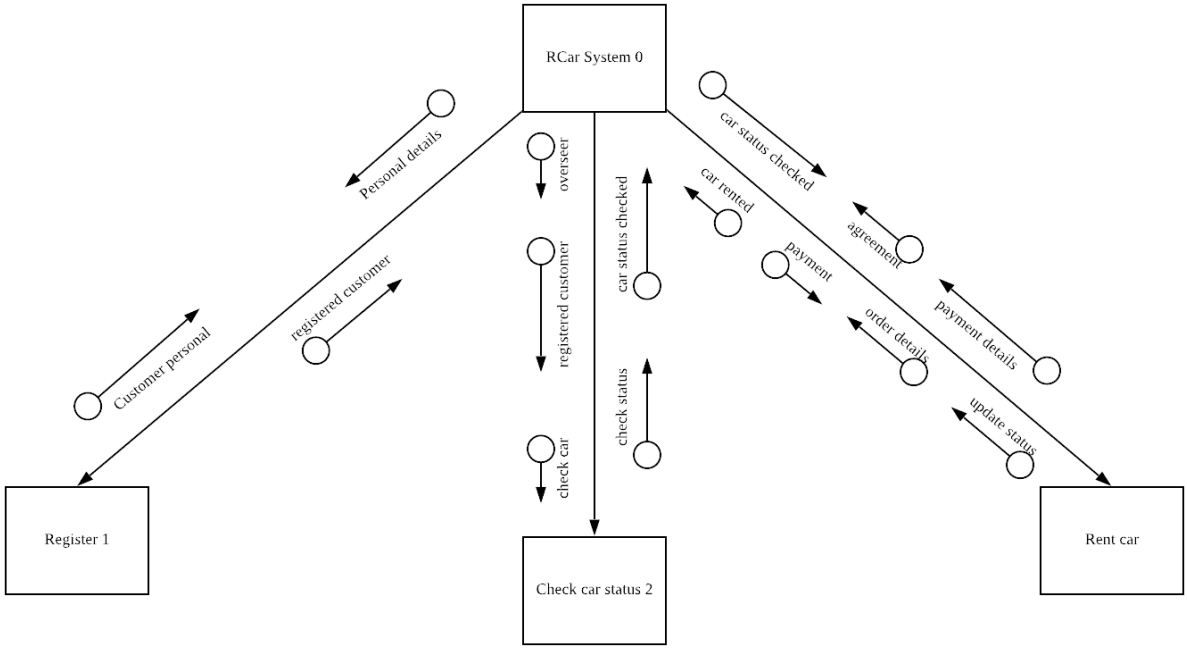
Type of Process :
Online

Process Logic :

```
DO
        Want to rent car
        BEGIN IF
        IF new customer
                Register new account
                Fill in user information
        ELSE
                Login user account
        ENDIF
        User search prefered car
        BEGIN IF
        IF not available
                Cannot be order to rent
        ELSE
                Order to rent
        ENDIF
        Choose payment method
        Fill in the destination and duration
        Send order
        Wait for approval from staff
        Check for response in mail
        BEGIN IF
        IF order approved
                Rent success
        ELSE
                Rent fail
        ENDIF
```

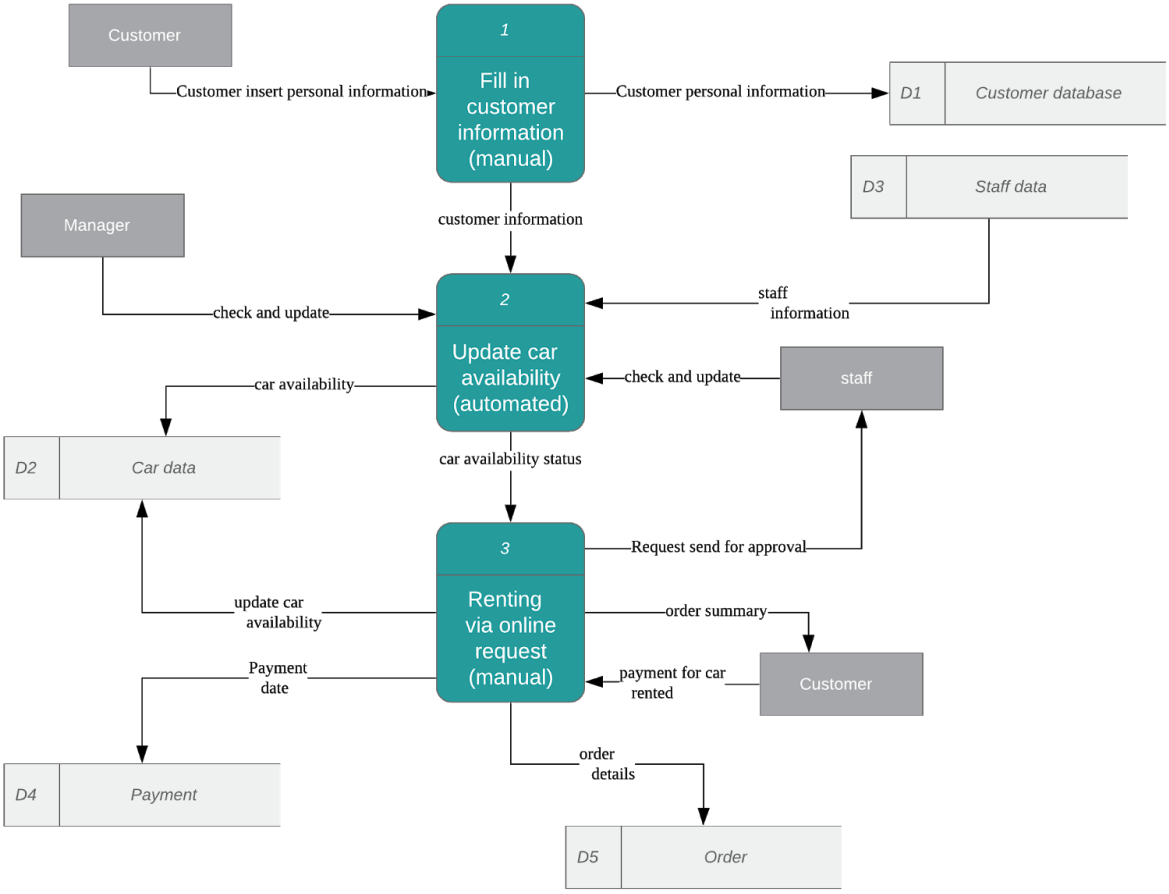
Refer to : Name :
Structured English

5.0 System Design

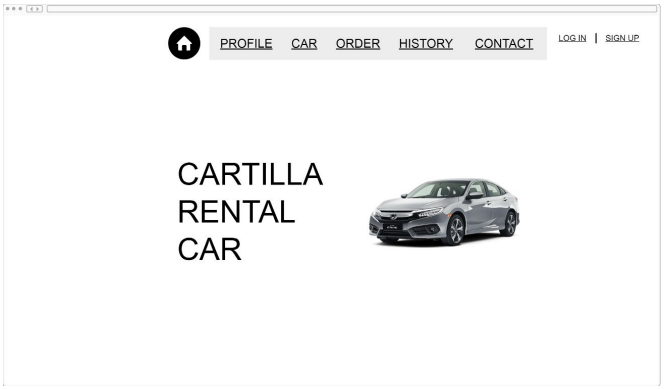


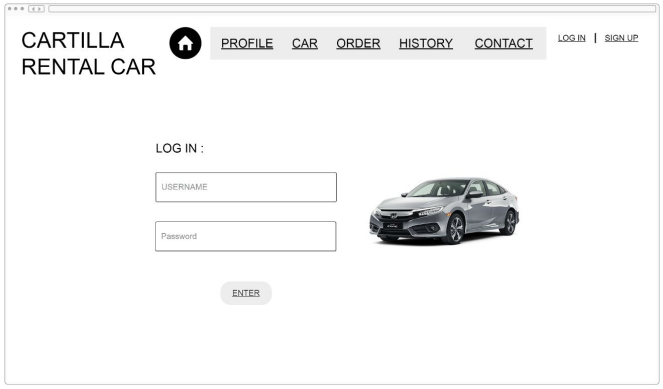
5.1 Physical DFD of the To-Be system

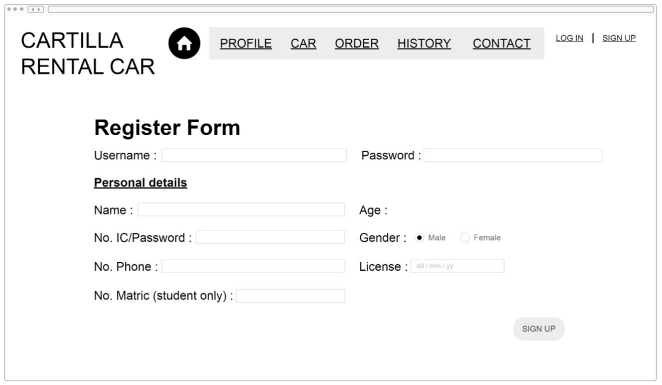
Data Flow Diagram To-Be (Physical)

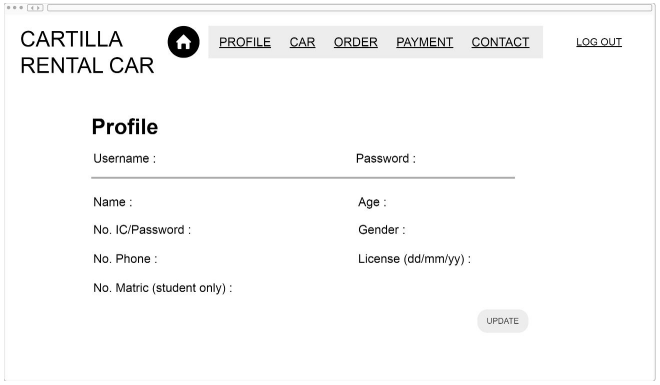


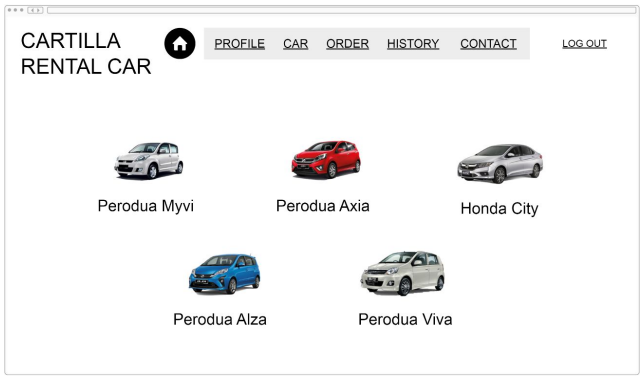
5.2 Interface Design (GUI)

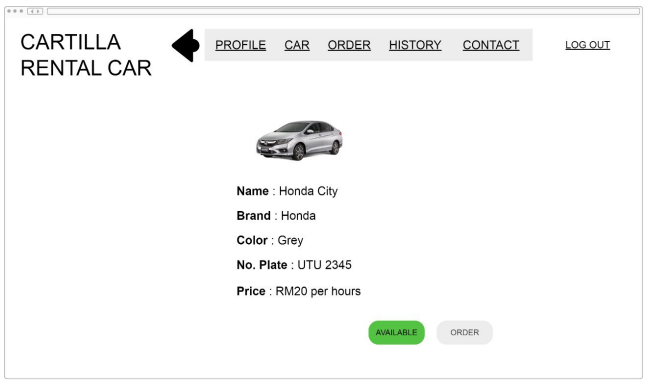


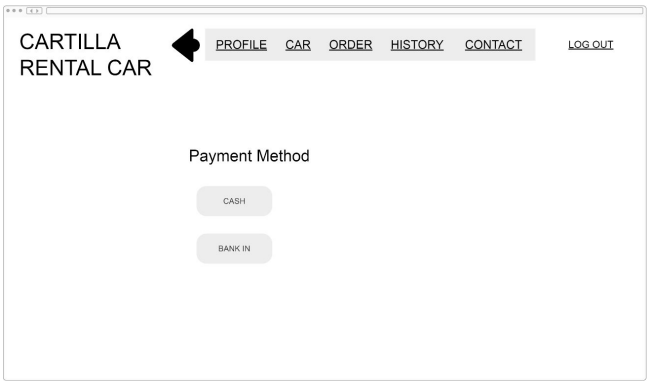


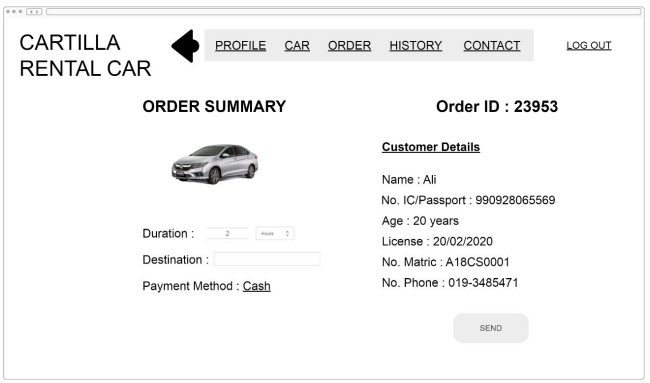


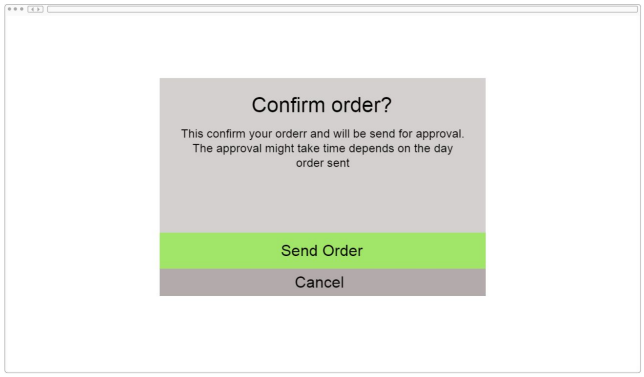


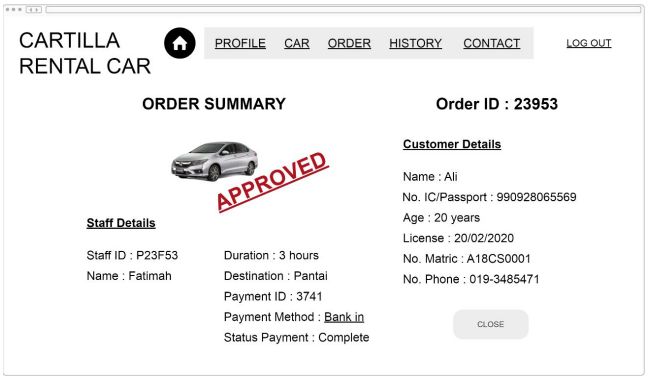

CARTILLA
RENTAL CAR
PROFILE
CAR
ORDER
HISTORY
CONTACT
LOG OUT
Perodua Myvi
Perodua Axia
Honda City
Perodua Alza
Perodua Viva

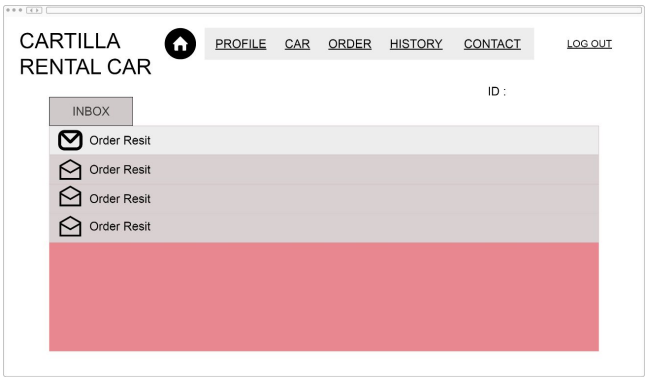

CARTILLA
RENTAL CAR
PROFILE
CAR
ORDER
HISTORY
CONTACT
LOG OUT
Name : Honda City
Brand : Honda
Color : Grey
No. Plate : UTU 2345
Price : RM20 per hours
AVAILABLE
ORDER

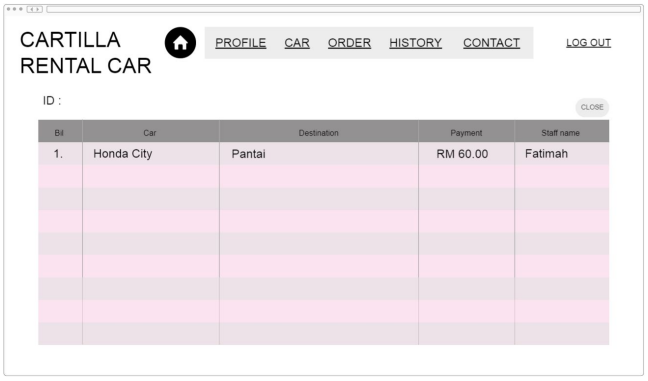

CARTILLA
RENTAL CAR
PROFILE
CAR
ORDER
HISTORY
CONTACT
LOG OUT
Payment Method
CASH
BANK IN

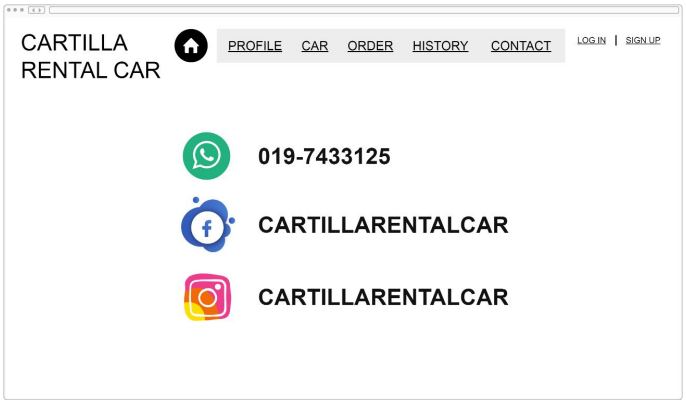

CARTILLA
RENTAL CAR
PROFILE
CAR
ORDER
HISTORY
CONTACT
LOG OUT
ORDER SUMMARY
Order ID : 23953
Customer Details
Name : Ali
No. IC/Passport : 990928065569
Age : 20 years
License : 20/02/2020
No. Matric : A18CS0001
No. Phone : 019-3485471
Duration :
Destination :
Payment Method : Cash
SEND

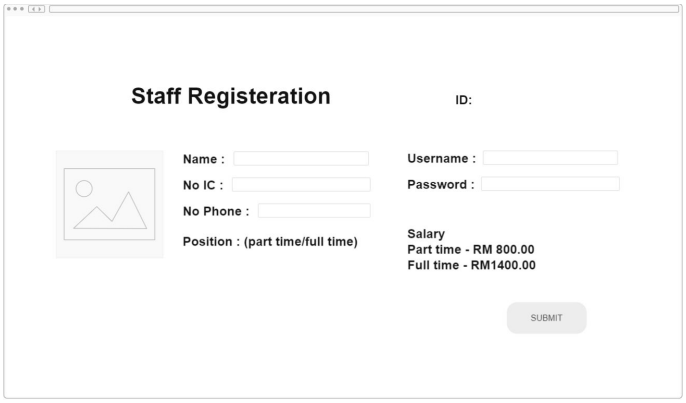

Confirm order?
This confirm your orderr and will be send for approval. The approval might take time depends on the day order sent
Send Order
Cancel

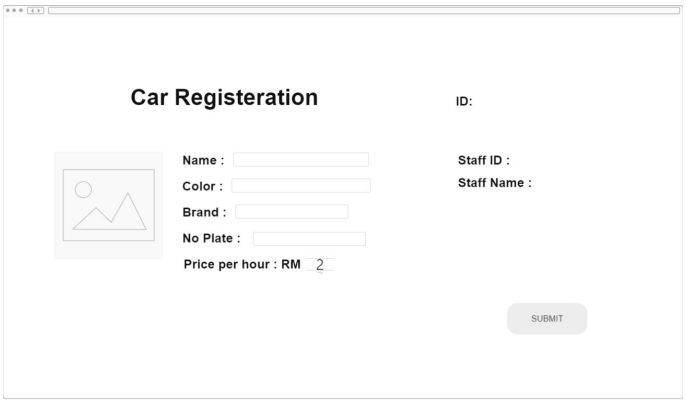

CARTILLA RENTAL CAR
PROFILE CAR ORDER HISTORY CONTACT
LOG OUT
ORDER SUMMARY
Order ID : 23953
APPROVED
Customer Details
Name : Ali
No. IC/Passport : 990928065569
Age : 20 years
License : 20/02/2020
No. Matric : A18CS0001
No. Phone : 019-3485471
Staff Details
Staff ID : P23F53
Name : Fatimah
Duration : 3 hours
Destination : Pantai
Payment ID : 3741
Payment Method : Bank in
Status Payment : Complete
CLOSE


CARTILLA RENTAL CAR
PROFILE CAR ORDER HISTORY CONTACT
LOG OUT
ID :
INBOX
Order Resit
Order Resit
Order Resit
Order Resit


CARTILLA RENTAL CAR
PROFILE CAR ORDER HISTORY CONTACT
LOG OUT
ID :
CLOSE
Bil
Car
Destination
Payment
Staff name
1.
Honda City
Pantai
RM 60.00
Fatimah


CARTILLA
RENTAL CAR
PROFILE
CAR
ORDER
HISTORY
CONTACT
LOG IN | SIGN UP
019-7433125
CARTILLARENTALCAR
CARTILLARENTALCAR


Staff Registeration
ID:
Name :
No IC :
No Phone :
Position : (part time/full time)
Username :
Password :
Salary
Part time - RM 800.00
Full time - RM1400.00
SUBMIT


Car Registeration
ID:
Name :
Color :
Brand :
No Plate :
Price per hour : RM 2
Staff ID :
Staff Name :
SUBMIT

6.0 Summary of proposed system

Compared with the past experience, car rental companies have exploded with new products when all activities relating to rental cars are restricted to just one location. While the physical location has not been totally eliminated, internet control has reshaped the design of tasks and how they are done.

These day, customers can rent their cars online, rent their cars online, and have the car collected when the customer is registered or is going to the office. The web-based rental car system had already presented both customers and Rental Company with just an advantage in controlling the business collaboratively and fulfilling the user's need while pressing a button.

Meeting Log 3

Date **:** 16 December 2019

Time **:** 2.00 PM – 3.00 PM

Location **:** N28A

Present: Muhammad Hafizul bin Shukran, Siti Nur Atikah binti Omar, Mohammad Ridzwan Syah bin Irwan, Nurul Ismat Tanni

Absent: None

Meeting Title: Project (Part 3) Discussion

Agenda :

1. Discuss about P3 (P3 Guideline)
    a. Sketch the DFD(to-be) and ERD how the new system works after P2 already done.
    b. Decide what type process specification that suitable with our system.
    c. Discuss to sketch the design user interface
        - How the customer view
        - How the Staff view
        - How the Car view.
2. Contribute the task for team member.

Adjournment:

The meeting was adjourned by Muhammad Hafizul and this will be last meeting for our project.

Minutes submitted by : Siti Nur Atikah Binti Omar

Minutes approved by : Muhammad Hafizul bin Shukran