



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

FACULTY OF ENGINEERING

SCHOOL OF COMPUTING

SESSION 2020/2021

SEMESTER 1

SECD2523 DATABASE

SECTION 08

FINAL PROJECT REPORT

LECTURER : Dr. Sharin Hazlin binti Huspi

GROUP 5

NAME	NO. MATRIC
MAU KHAI SHEN	
LIM CHIN QING	
CHIAM WOOI CHIN	
NG JING ER	

TABLE OF CONTENTS

1.0 Database Planning and System Definition	3
1.1 An overview for current system	3
1.2 Database Planning	4
1.2.1 Mission Statement	4
1.2.2 Mission Objective	4
1.3 System Definition	5
1.3.1 Systems Boundary	5
1.3.2 Major User View	6
1.4 Gantt Chart	7
2.0 Database Design Requirements	8
2.1 Data Requirements	8
2.2 Transaction Requirements	10
2.3 Cross-Reference Analysis	12
3.0 Conceptual Database Design	13
3.1 Entity Relationship Diagram	13
4.0 Logical Database Design	14
4.1 Logical Entity Relationship Diagram (Logical ERD)	14
4.2 Relation Database Schema	15
4.3 Data dictionary for Logic 1 D taba e Design	17
5.0 Project Implementation	20
5.1 Structured Query Languag	20
5.2 Set of Qu ries for Each Transaction	30
5.3 User Manual	36
5.4 Interfaces with SQL Statements	40
5.5 Dat Flow Diagram (DFD)	51
5.5.1 C ntext Diagram	51
5.5.2 Diagram 0	52
5.5.3 Child Diagram of Process 2	53
5.5.4 Child Diagram of Process 3	53
5.5.5 Child Diagram of Process 4	54
5.5.6 Child Diagram of Process 6	54

1.0 Database Planning and System Definition

1.1 An overview for current system

JMY Transport is a travel and transport agency located in Pontian, Johor. JMY Transport provides transportation services such as bus and van rental services and also shuttle services. Since there are a lot of customers that use the service of JMY Transport, including the regular customers that rent the bus for travel purposes, and especially UTM students that rent for activity purposes. From the interview, we were informed that the current system to record and process the rental deal is based on whatsapp and manually recording which seem to be not effective.

According to the staff of JMY Transport, it is difficult to track back the status of rental transactions and it takes time to record again the buses that are available to be rented. A payment voucher will be sent to customers that settle the rental payment one by one via whatsapp. Below is the example of payment voucher from JMY Transport.



1.2 Database Planning

1.2.1 Mission Statement

The main purpose of the bus rental database system is to maintain the data of transactions that is generated to support the bus rental services such as online booking of the available bus for the customers. Besides, the bus rental database system should help to ease the transaction of the bus rental company as it acts as an online interconnected database between company, staff and customers.

1.2.2 Mission Objective

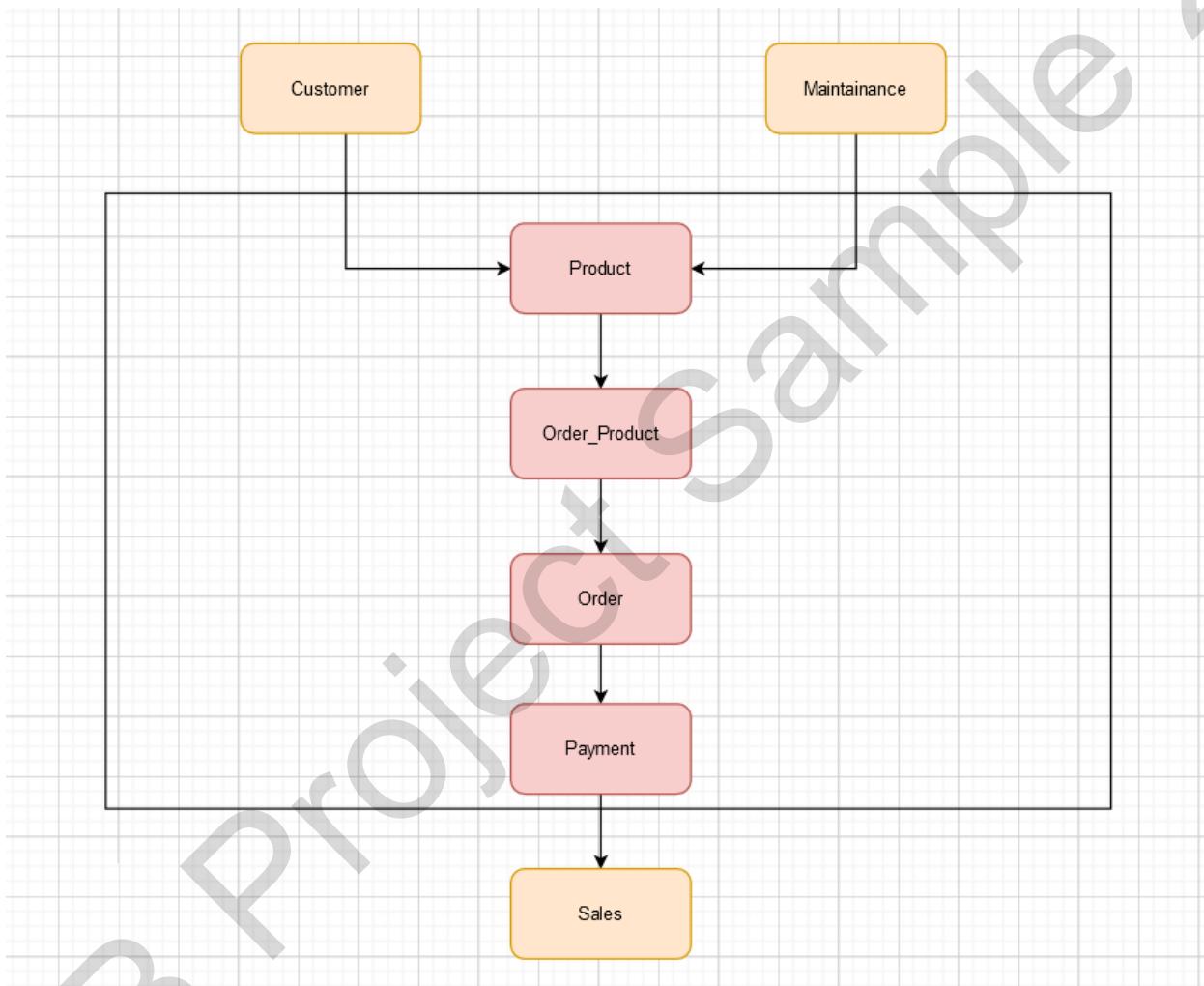
The mission objectives of our database planning are:

- a. To maintain data (enter, update, delete) of transactions which include customer, bus rented and payment.
- b. To report on customer, bus rent and payment.
- c. To track the status of bus availability, the status of rental transactions and payment status.

1.3 System Definition

1.3.1 Systems Boundary

This is the system boundary of our projects. The figure shown has a black line square that is the only part that we will be going to include in our system planning. We only focus on the project of Vehicle rental systems.



1.3.2 Major User View

There are a few users in this system. They are customers, staff and manager. The major user view for each of the user groups will be shown in the table below.

DATA	Access Type	Manager	Staff/Admin	Customer
Customer	Maintain Query Report	X X		X
Staff/Admin	Maintain Query Report	X X X	X	
Bus/Van	Maintain Query Report	X X X	X X	X
Booking_Order	Maintain Query Report	X		X X
Order	Maintain Query Report	X X	X X	X X
Payment	Maintain Query Report	X X X	X X	X

1.4 Gantt Chart

Below is the Gantt chart produced for the whole database system project.

2.0 Database Design Requirements

2.1 Data Requirements

Entity	Data to be stored	Requirements of Data
Customer	1. Customer ID 2. Name 3. Email 4. Password 5. Phone number 6. Security question	- [1] Customer ID is unique. - [3] Customers need to sign up an account by their email before using the system. - [5] Phone number must be verified upon signing up. - [6] A security question must be easily answered by the account owner.
Staff / Admin	1. Name 2. Email 3. Username 4. Password 5. Phone number	- [2] Admin need to sign up an account to access and manipulate the data in the system.
Bus / Van	1. Plate number 2. Model 3. Rental 4. Availability	- [3] The amount of rental displayed is the estimated price. - [4] Availability of buses should be indicated on the system.

Booking_Order	1. Booking ID 2. Bus model 3. Pick up date & time 4. Pick up address 5. Drop off address 6. Number of passengers 7. Travel route	<ul style="list-style-type: none"> - [1] Booking ID is unique. - [3] Pick up date & time should be specified. - [4] Pick up address can be an exact location or a building name. - [5] Drop off address is optional.
Order	1. Order number 2. Order date 3. Order status 4. Total price	<ul style="list-style-type: none"> - [1] Order number is unique and should be generated automatically. - [2] Order date is the date when the order is placed. - [4] Total price is determined by an admin.
Payment	1. Transaction number 2. Payment date 3. Payment method 4. Total price	<ul style="list-style-type: none"> - [1] Transaction number is unique. - [2] Payment date is the date when the payment is made.

2.2 Transaction Requirements

Entity	Data	Data Entry	Data Update	Data Deletion	Data Queries
Customer	1. Customer ID 2. Name 3. Email 4. Password 5. Phone number 6. Security question	Sign up by customer	Update information by customer	Delete account by customer	Query on customer data by manager
Staff/Admin	1. Name 2. Email 3. Username 4. Password 5. Phone number	Sign up by staff/admin	Update information by staff/admin	Delete account by staff/admin	Query on staff/admin data by manager
Bus/Van	1. Plate number 2. Model 3. Rental 4. Availability	Enter Bus/Van information by staff/admin	Update Bus/Van information by staff/admin	Delete Bus/Van information by staff/admin	Search for Bus/Van information by manager, staff/admin and customer
Booking Ord	1. Booking ID 2. Bus model 3. Pick up date & time 4. Pick up address	Add booking order by customer			

	5. Drop off address 6. Number of passengers 7. Travel route				
Order	1. Order number 2. Order date 3. Order status 4. Total price	Confirm order by customer	Update order status by staff/admin	Cancel order by staff/admin	Query on order by manager, staff/admin
Payment	1. Transaction number 2. Payment date 3. Payment method 4. Total price	Enter payment method, transaction number and payment date by customer	Confirm payment by staff/admin	Delete payment by staff/admin	Query on payment by manager, staff/admin

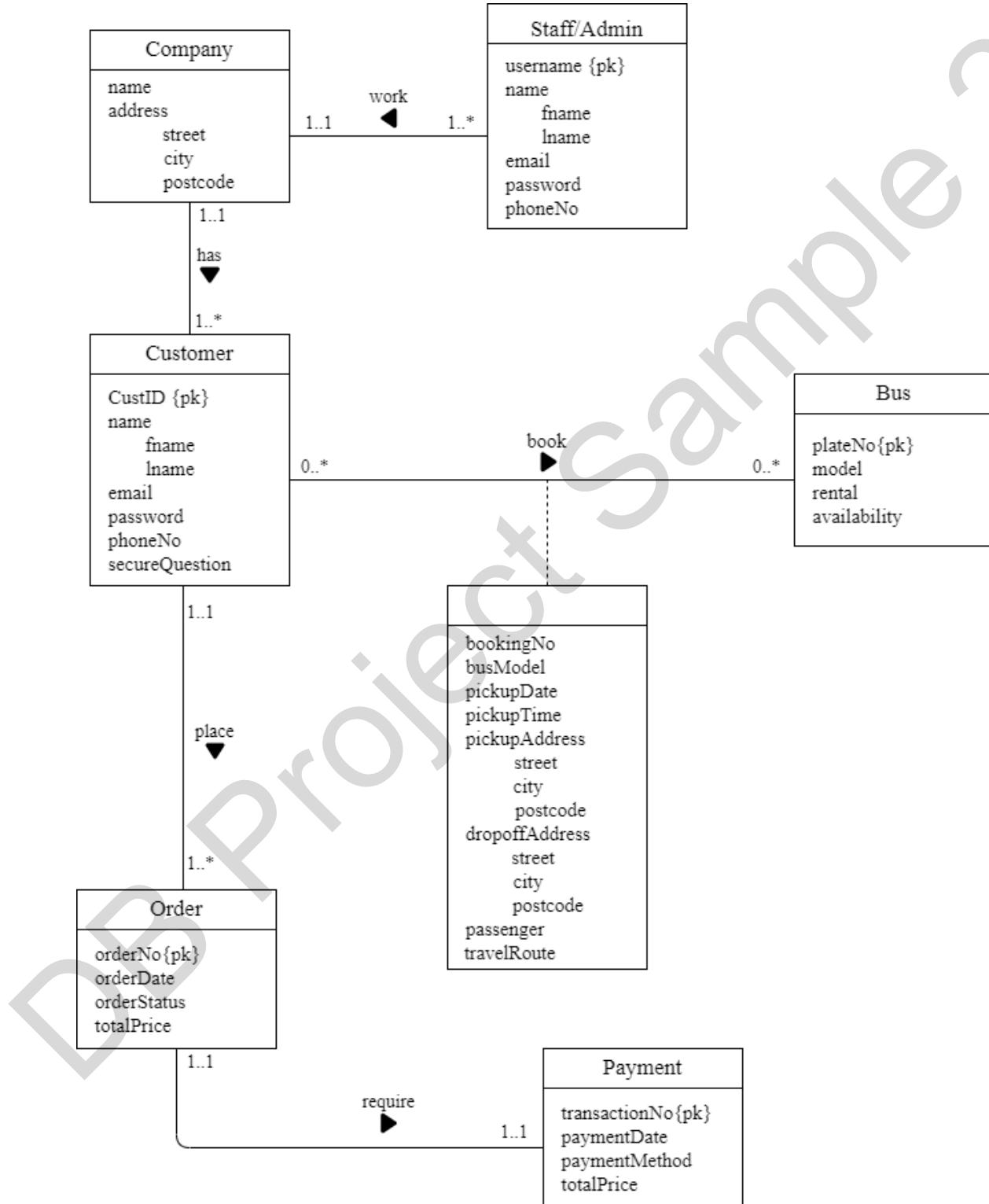
2.3 Cross-Reference Analysis

The table below cross-references the Manager, Staff/Admin and Customer user views with the main types of data used by each user view.

	Manager	Staff / Admin	Customer
Customer	X		X
Staff/Admin	X	X	
Bus/Van	X	X	X
Booking_Order	X		X
Order	X	X	X
Payment	X	X	X

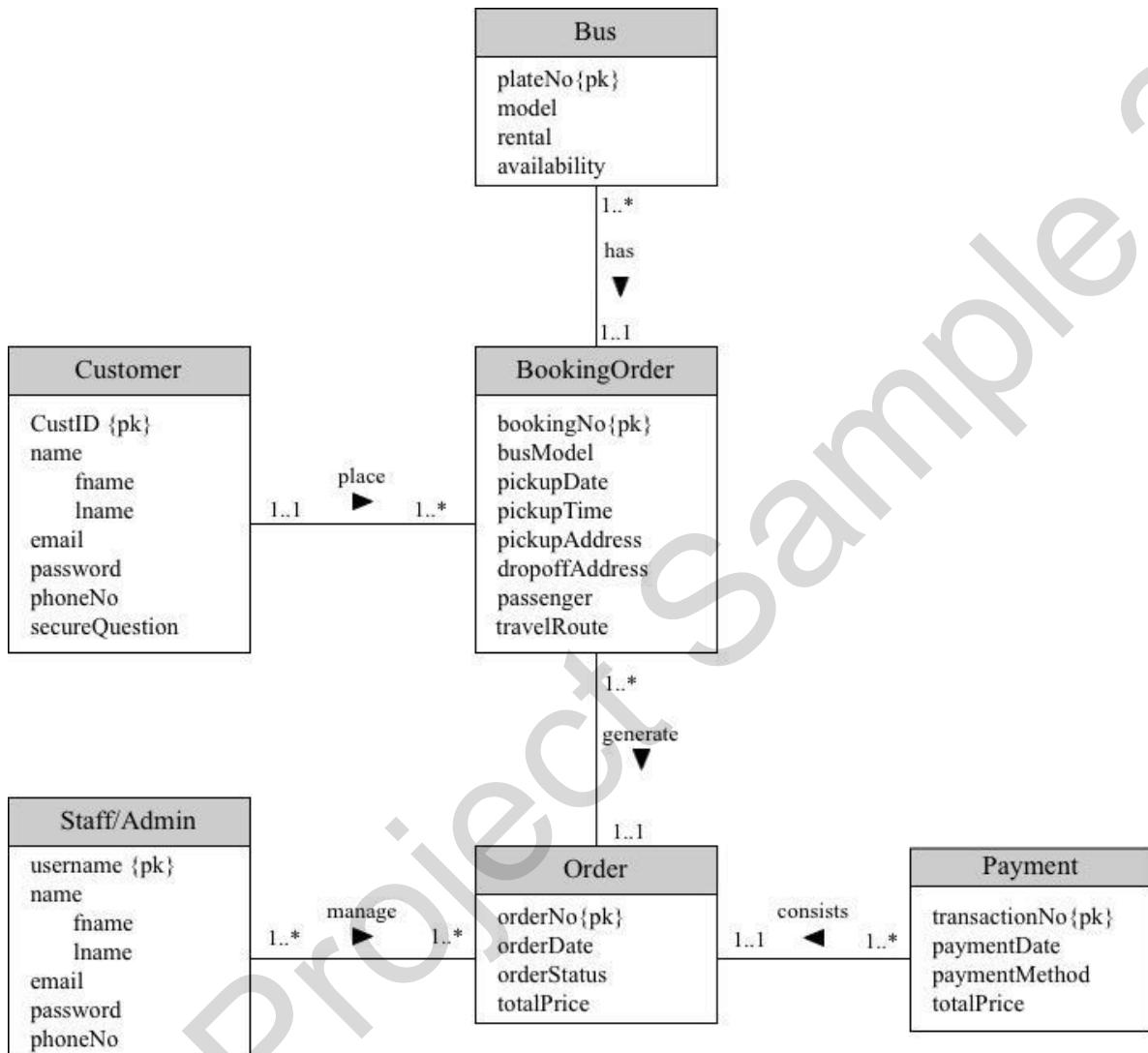
3.0 Conceptual Database Design

3.1 Entity Relationship Diagram



4.0 Logical Database Design

4.1 Logical Entity Relationship Diagram (Logical ERD)



4.2 Relation Database Schema

Since there is no partial dependency (PD) and transitive dependency (TD) in all relations, therefore the relations **STAFF**, **CUSTOMER**, **ORDER**, **BUS**, **BOOKING_ORDER** and **PAYMENT** are already in BCNF relation.

i. STAFF (username, fname, lname, email, password, phoneNo)

STAFF

username	fname	lname	email	password	phoneNo

PK: username

FD1: username \square fname, lname, email, password, phoneNo

FD1 is full functional dependency. Relation STAFF is in BCNF

ii. CUSTOMER (CustID, fname, lname, email, password, phoneNo, secureQuestion)

CUSTOMER

CustID	fname	lname	email	password	phoneNo	secureQuestion

PK: CustID

FD1: CustID \square fname, lname, email, password, phoneNo, secureQuestion

FD1 is full functional dependency. Relation CUSTOMER is in BCNF.

iii. ORDER (orderNo, CustID, orderDate, orderStatus, totalPrice)

ORDER

orderNo	CustID	orderDate	orderStatus	totalPrice
		↑	↑	↑

PK: orderNo, CustID

FK: CustID

FD1: orderNo, CustID \square orderDate, orderStatus, totalPrice

FD1 is full functional dependency. Relation ORDER is in BCNF.

iv. BUS (plateNo, model, rental, availability)

BUS

plateNo	model	rental	availability
	↑	↑	↑

PK: plateNo

FD1: plateNo \square model, rental, availability

FD1 is full functional dependency. Relation BUS is in BCNF.

v. BOOKING_ORDER (bookingNo, busModel, pickupDate, pickupTime, pickupAddress, dropoffAddress passenger, travelRoute)

BOOKING_ORDER

bookingNo	busModel	pickupDate	pickupTime	pickupAddress	dropoffAddress	passenger	travelRoute
	↑	↑	↑	↑	↑	↑	↑

PK: bookingNo

FD1: bookingNo \square busModel, pickupDate, pickupTime, pickupAddress, dropoffAddress, passenger, travelRoute

FD1 is full functional dependency. Relation BOOKING_ORDER is in BCNF.

vi. PAYMENT (transactionNo, paymentDate, paymentMethod, totalPrice, orderNo)

PAYMENT

transactionNo	paymentDate	paymentMethod	totalPrice	orderNo



PK: transactionNo

FK: orderNo

FD1: transactionNo \square paymentDate, paymentMethod, totalPrice, orderNo

FD1 is full functional dependency. Relation PAYMENT is in BCNF.

vii. BUS_BOOKING_ORDER (bookingNo, orderNo, plateNo)

BUS_BOOKING_ORDER

bookingNo	orderNo	plateNo



PK: bookingNo, orderNo

FD1: bookingNo, orderNo \square plate No

Final of normalized relation

- i. STAFF (username, name, lname, email, password, phoneNo)
- ii. CUSTOMER (CustID, fname, lname, email, password, phoneNo, secureQuestion)
- iii. ORDER (orderNo, CustID, orderDate, orderStatus, totalPrice)
- iv. BUS (plateNo, model, rental, availability)
- v. BOOKING_ORDER (bookingNo, busModel, pickupDate, pickupTime, pickupAddress, dropoffAddress, passenger, travelRoute)
- vi. PAYMENT (transactionNo, paymentDate, paymentMethod, totalPrice, orderNo)
- vii. BUS_BOOKING_ORDER (bookingNo, orderNo, plateNo)

4.3 Data dictionary for Logical Database Design

Entity Name	Attributes	Description	Data Type & Length	Nulls	Multi-valued
Staff/Admin	username name fname lname email password phoneNo	Uniquely identifies a staff/admin First name of staff/admin Last name of staff/admin Email address of staff/admin Password for the account Phone number of staff/admin	20 variable characters 20 variable characters 20 variable characters 50 variable characters 20 variable characters Integer	NO NO NO NO NO NO	NO NO NO NO NO NO
Customer	CustID name fname lname email password phoneNo secureQuestion	Uniquely identifies a customer First name of customer Last name of customer Email address of customer Password for the account Phone number of customer Security question to be answered by customer	8 variable characters 20 variable characters 20 variable characters 50 variable characters 20 variable characters Integer 100 variable characters	NO NO NO NO NO NO	NO NO NO NO NO NO
Bus	plateNo model rental availability	Uniquely identifies a bus Model of bus Rental price of bus Availability of bus	8 variable characters 50 variable characters Decimal 15 variable characters	NO NO NO NO	NO NO NO NO

Booking_Order	bookingNo busModel pickupDate pickupTime pickupAddress dropoffAddress passenger travelRoute	Uniquely identifies a BookingOrder Model of bus rented Date of pick up Time of pick up Location of pick up point Location of drop off point Number of passengers Travel route	20 variable characters 20 variable characters 15 variable characters 20 variable characters 120 variable characters 120 variable characters Integer 500 variable characters	NO NO NO NO NO YES NO NO	NO NO NO NO NO NO NO NO
Order	orderNo orderDate orderStatus totalPrice CustID	Uniquely identifies an order Order date of an order Order status of an order The total price of the order Foreign key references Customer(CustID)	20 variable characters 15 variable characters 1 variable characters Decimal 8 variable characters	NO NO NO NO NO	NO NO NO NO NO
Payment	transactionNo paymentDate paymentMethod totalPrice orderNo	Uniquely identifies a payment Date of the payment made Method of the payment made The total price of the payment Foreign key references Order(orderNo)	20 variable characters Date 20 variable characters Decimal 20 variable characters	NO NO NO NO NO	NO NO NO NO NO
Bus_Booking_Order	bookingNo orderNo plateNo	Foreign key references Booking_Order(bookingNo) Foreign key references Order(orderNo) Foreign key references Bus(plateNo)	20 variable characters 20 variable characters 8 variable characters	NO NO NO	NO NO NO

5.0 Project Implementation

5.1 Structured Query Language

-----CREATING TABLES-----

```
CREATE TABLE CUSTOMER(  
CUST_ID          VARCHAR2(8) PRIMARY KEY,  
CUST_FNAME       VARCHAR2(20) NOT NULL,  
CUST_LNAME       VARCHAR2(20) NOT NULL,  
CUST_PHONE_NO    NUMBER NOT NULL,  
CUST_EMAIL       VARCHAR2(50) NOT NULL,  
CUST_PWORD       VARCHAR2(20) NOT NULL,  
SECURE_QUESTION  VARCHAR(100) NOT NULL)  
;
```

```
CREATE TABLE STAFF(  
STF_FNAME        VARCHAR2(20) NOT NULL,  
STF_LNAME        VARCHAR2(20) NOT NULL,  
USERNAME         VARCHAR2(20) PRIMARY KEY,  
STF_PHONE_NO     NUMBER NOT NULL,  
STF_EMAIL        VARCHAR2(50) NOT NULL,  
STF_PWORD        VARCHAR2(20) NOT NULL)  
;
```

```
CREATE TABLE BUS(  
PLATE_NO         VARCHAR2(8) PRIMARY KEY,  
MODEL_           VARCHAR2(50) NOT NULL,  
RENAL            DECIMAL NOT NULL,  
AVAILABILITY_   VARCHAR2(15) NOT NULL)  
;
```

```
CREATE TABLE BOOKING_ORDER(  
BOOKING_NO       VARCHAR2(20) PRIMARY KEY,  
BUSMODEL         VARCHAR2(20) NOT NULL,  
PICKUPDATE       VARCHAR2(15) NOT NULL,
```

```
PICKUPTIME      VARCHAR2(20) NOT NULL,  
PICKUPADDRESS   VARCHAR2(120) NOT NULL,  
DROPOFFADDRESS  VARCHAR2(120),  
PASSENGER       NUMBER NOT NULL,  
TRAVELROUTE     VARCHAR2(500) NOT NULL)  
;
```

```
CREATE TABLE ORDER_(  
ORDER_NO        VARCHAR2(20) PRIMARY KEY,  
ORDER_DATE      VARCHAR2(15) NOT NULL,  
ORDER_STATUS    VARCHAR2(15) NOT NULL,  
TOTALPRICE      DECIMAL NOT NULL,  
CUST_ID         VARCHAR2(8) NOT NULL,  
FOREIGN KEY (CUST_ID) REFERENCES CUSTOMER(CUST_ID))  
;
```

```
CREATE TABLE PAYMENT(  
TRANSACTION_NO  VARCHAR2(20) PRIMARY KEY,  
PAYMENT_DATE    DATE NOT NULL,  
PAYMENT_METHOD  VARCHAR2(20) NOT NULL,  
TOTALPRICE      DECIMAL NOT NULL,  
ORDER_NO        VARCHAR2(20),  
FOREIGN KEY (ORDER_NO) REFERENCES ORDER_(ORDER_NO))  
;
```

```
CREATE TABLE B_S_BOOKING_ORDER(  
BOOKING_NO      VARCHAR2(20) REFERENCES BOOKING_ORDER(BOOKING_NO),  
ORDER_NO        VARCHAR2(20) REFERENCES ORDER_(ORDER_NO),  
PLATE_NO        VARCHAR2(8) REFERENCES BUS(PLATE_NO))  
;
```

-----SIGN UP (STAFF)-----

```
INSERT INTO STAFF  
VALUES ('Peter', 'Tan', 'STF10062A', 0123456789, 'peter@gmail.com', '123456')  
;
```

-----ADD BUS (STAFF)-----

```
INSERT INTO BUS  
VALUES ('BJN 2731','Mini Bus 19-Seated',468,'Y')  
;
```

```
INSERT INTO BUS  
VALUES ('BJN 2738','Mini Bus 19-Seated',468,'Y')  
;
```

```
INSERT INTO BUS  
VALUES ('BJN 2743','Mini Bus 19-Seated',468 'Y')  
;
```

```
INSERT INTO BUS  
VALUES ('BJN 8267' , 'Bus 25-Seat d',540,'Y')  
;
```

```
INSERT INTO BUS  
VALUES ('BJN 2863','Bus 25-Seated',540,'N')  
;
```

```
INSERT NTO BUS  
VALUE ('BJN 7351','Bus 25-Seated',540,'Y')  
;
```

```
INSERT INTO BUS  
VALUES ('BJN 7388','Bus 40-Seated',809,'Y')  
;
```

```
INSERT INTO BUS  
VALUES ('BJN 2218','Bus 40-Seated',809,'N')  
;
```

```
INSERT INTO BUS  
VALUES ('BJN 6712','Bus 40-Seated',809,'N')  
;
```

```
INSERT INTO BUS  
VALUES ('BJN 6724','Bus 40-Seated',809,'N')  
;
```

```
INSERT INTO BUS  
VALUES ('VJN 2231','Van 16-Seated',338,'Y')  
;
```

```
INSERT INTO BUS  
VALUES ('VJN 2541','Van 16-Seated',338,Y)  
;
```

-----UPDATE BUS INFO (STAFF) -----

```
UPDATE BUS  
SET AVAILABILITY_ = 'Y'  
WHERE PLATE_NO = 'BJN 2218'  
;
```

-----DELETE BUS (STAFF)-----

```
ELETE FROM BUS  
WHERE PLATE_NO= 'BJN 2738'  
;
```

-----SIGN UP (CUSTOMER)-----

```
INSERT INTO CUSTOMER  
VALUES ('C210087', 'Ali','Bin Ahmad', 0128889999, 'aliahmad@gmail.com', '123456',  
'ANSWER')  
;
```

```
INSERT INTO CUSTOMER  
VALUES('C210088', 'GENIE', 'LIEW', 0129876543, 'genie@example.com', 'passtestword',  
'LIEW')  
;
```

```
INSERT INTO CUSTOMER  
VALUES ('C210043', 'Hannah','Joseph', 0134457788, 'hannah@gmail.com', 'hannah7788',  
'JOSEPH')  
;
```

-----DISPLAY CUSTOMER INFO (CUSTOMER)-----

```
SELECT CUST_FNAME || ' ' || CUST_LNAME "Customer Name", 'ID: ' || CUST_ID "Customer  
ID"  
FROM CUSTOMER  
WHERE CUST_ID = 'C210087'  
;
```

-----UPDATE CUSTOMER INFO (CUSTOMER)-----

```
UPDATE CUSTOMER  
SET CUST_PHONE_NO=0134567890  
WHERE CUST_ID ='C210087'  
;
```

-----QUERY BUS (CUSTOMER)-----

```
SELECT MODEL_, RENTAL, AVAILABILITY_  
FROM BUS
```

```
WHERE MODEL_ = 'Mini Bus 19-Seated'  
;
```

```
SELECT MODEL_, RENTAL, AVAILABILITY_  
FROM BUS  
WHERE MODEL_ = 'Bus 40-Seated'  
;
```

```
SELECT MODEL_, RENTAL, AVAILABILITY_  
FROM BUS  
WHERE MODEL_ = 'Van 16-Seated'  
;
```

-----BOOKING BUS (CUSTOMER)-----

```
INSERT INTO BOOKING_ORDER  
VALUES ('BK200342', 'Mini Bus 16-Seated', TO_DATE('31/ 1/2021', 'DD/MM/YYYY'), '08:00  
AM', 'UTM SKUDAI, JOHOR BAHRU', 'UTM SKUDAI, JOHOR BAHRU', 10, 'UTM -> PULAI SPRING  
RESORT ->Paradigm Mall')  
;
```

```
INSERT INTO BOOKING_ORDER  
VALUES ('BK200351', 'Mini Bus 19-Seated', TO_DATE('18/01/2021', 'DD/MM/YYYY'), '8:00  
AM', 'M25, Kolej Tun Dr Ismail, UTM Skudai, Johor', ' ', 18, 'M25 to Paradigm Mall then to  
Sutera Mall back to pick up address')  
;
```

```
INSERT INTO BOOKING_ORDER  
VALUES ('BK200352', 'Bus 25-Seated', TO_DATE('20/01/2021', 'DD/MM/YYYY'), '9:00 AM',  
'73, Jalan Cempaka 34/12, 81000 Kulai, Johor', 'Don Hu Jurassic Park  
Kampung Sabak Aur, 84000 Muar, Johor', 25, 'Send us to Jalan Meriam, Pekan Muar, 84000  
Muar, Johor after the jurassic park  
Our hotel is at No 18-1, Taman Indah Jalan Haji Abdullah, 84000 Muar')  
;
```

```
INSERT INTO BOOKING_ORDER  
VALUES ('BK200353', 'Bus 25-Seated', TO_DATE('18/01/2021', 'DD/MM/YYYY'), '10:00 AM',  
'Blok M01, Kolej Tun Dr Ismail,  
UTM Skudai, Johor', 'Blok M01, Kolej Tun Dr Ismail,  
UTM Skudai, Johor', 49, 'Send us to The Mall, Mid Valley Southkey  
1, Persiaran Southkey 1, Southkey, 80150 Johor Bahru, Johor  
Send us back to the drop off address at 9:00 PM')  
;
```

-----VIEW BOOKING (STAFF)-----

```
SELECT *  
FROM BOOKING_ORDER  
;
```

-----MANAGE BOOKING- CONFIRM BOOKING (STAFF)-----

```
INSERT INTO ORDER_  
VALUES ('OR10056024', SYSDATE, 'Unpaid , 1425 00, 'C210087')  
;
```

```
INSERT INTO ORDER_  
VALUES ('OR10056086', SYSDATE, 'Unpaid', 468.00, 'C210088')  
;
```

```
INSERT INTO ORDER_  
VALUES ('OR10056 64', SYSDATE, 'Unpaid', 455.00, 'C210043')  
;
```

```
UPDATE ORDER_  
ET TOTALPRICE = 445.00  
WHERE ORDER_NO = 'OR10056086'  
;
```

-----VIEW UNPAID ORDER (CUSTOMER)-----

```
SELECT ORDER_NO, ORDER_DATE, ORDER_STATUS, TOTALPRICE  
FROM ORDER_  
WHERE ORDER_STATUS = 'Unpaid'  
AND CUST_ID = 'C210087'  
;
```

-----**MAKE PAYMENT (CUSTOMER)**-----

```
INSERT INTO PAYMENT  
VALUES ('TN10056024', SYSDATE, 'Debit/Credit Card', 1425.00, 'OR10 5602')  
;
```

```
UPDATE ORDER_  
SET ORDER_STATUS = 'Paid'  
WHERE ORDER_NO = 'OR10056024'  
;
```

-----**VIEW BUS INFO (STAFF)**-----

```
SELECT * FROM BUS  
;
```

-----**SEARCH ORDER (STAFF)**-----

```
SELECT ORDER_NO  
FROM ORDER_  
WHERE ORDER_NO = 'OR10056071'  
OR ORDER_NO LIKE 'OR10056%'  
;
```

-----**VIEW ORDER (STAFF)**-----

```
SELECT * FROM ORDER_  
;
```

```
SELECT c.CUST_ID, c.CUST_FNAME, bbo.BOOKING_NO, bo.BUSMODEL, bbo.PLATE_NO,
o.ORDER_NO, o.ORDER_DATE, p.TOTALPRICE AS "Amount Paid"
FROM CUSTOMER c FULL JOIN ORDER_ o
ON c.CUST_ID = o.CUST_ID
FULL JOIN PAYMENT p
ON o.ORDER_NO = p.ORDER_NO
FULL JOIN BUS_BOOKING_ORDER bbo
ON bbo.ORDER_NO = p.ORDER_NO
FULL JOIN BOOKING_ORDER bo
ON bbo.BOOKING_NO = bo.BOOKING_NO
WHERE o.ORDER_NO = 'OR10056024'
;
```

-----MANAGE ORDER-ASSIGN PLATE NO (STAFF)-----

```
INSERT INTO BUS_BOOKING_ORDER
VALUES ('BK200342', 'OR10056024', 'BJN 6 12')
;
```

```
INSERT INTO BUS_BOOKING_ORDER
VALUES ('BK200342', 'OR10056024', 'BJN 6724')
;
```

```
INSERT INTO BUS_BOOKING_ORDER
VALUES ('BK200351', 'OR10056086', 'BJN 2731')
;
```

--VIEW PAID ORDER (CUSTOMER)-----

```
ELEC ORDER_NO, ORDER_DATE, ORDER_STATUS, TOTALPRICE
FROM ORDER_
WHERE ORDER_STATUS ='Paid'
AND CUST_ID = 'C210087'
;
```

```
SELECT o.ORDER_NO, o.ORDER_DATE, o.ORDER_STATUS, o.TOTALPRICE,  
p.TRANSACTION_NO, p.PAYMENT_DATE, p.PAYMENT_METHOD, p.TOTALPRICE AS "Amount  
Paid", bbo.PLATE_NO, b.MODEL_  
FROM ORDER_ o JOIN PAYMENT p  
ON o.ORDER_NO = p.ORDER_NO  
JOIN BUS_BOOKING_ORDER bbo  
ON bbo.ORDER_NO = p.ORDER_NO  
JOIN BUS b  
ON b.PLATE_NO = bbo.PLATE_NO  
WHERE o.ORDER_NO = 'OR10056024'  
;
```

-----CALCULATE THE DISCOUNT RATE (STAFF)-----

```
SELECT DISTINCT o.ORDER_NO, ROUND(TO_CHAR(b.RENTAL-  
o.TOTALPRICE)/b.RENTAL*100, 2) AS "Percentage of Discount"  
FROM BUS b JOIN BUS_BOOKING_ORDER b_o  
ON b.PLATE_NO = bbo.PLATE_NO  
JOIN ORDER_ o  
ON o.ORDER_NO = bbo.ORDER_NO  
WHERE o.ORDER_NO = 'OR10056086'  
AND b.RENTAL = 468  
;
```

5.2 Set of Queries for Each Transaction

---QUERIES---

```
SELECT * FROM CUSTOMER;  
SELECT * FROM STAFF;  
SELECT * FROM BUS;  
SELECT * FROM BOOKING_ORDER;  
SELECT * FROM ORDER_;  
SELECT * FROM PAYMENT;  
SELECT * FROM BUS_BOOKING_ORDER;
```

CUSTOMER

CUST_ID	CUST_FNAME	CUST_LNAME	CUST_PHONE_NO	CUST_EMAIL	CUST_PWORD	SECURE_QUESTION
C210087	Ali	Bin Ahmad	134567890	aliahmad@gmail.com	123456	ANSWER
C210088	GENIE	LIEW	129876543	genie@example.com	passtestword	LIEW
C210043	Hannah	Joseph	134457788	hannah@gmail.com	hannah7788	JOSEPH

[Download CSV](#)

3 rows selected.

STAFF

STF_FNAME	STF_LNAME	USERNAME	STF_PHONE_NO	STF_EMAIL	STF_PWORD
Peter	Tan	STF10062A	123456789	peter@gmail.com	123456

[Download CSV](#)

BUS

PLATE_NO	MODEL_	RENTAL	AVAILABILITY_
BJN 2731	Mini Bus 19-Seated	468	Y
BJN 2743	Mini Bus 19-Seated	468	Y
BJN 8267	Bus 25-Seated	540	Y
BJN 2863	Bus 25-Seated	540	N
BJN 7351	Bus 25-Seated	540	Y
BJN 7388	Bus 40-Seated	809	Y
BJN 2218	Bus 40-Seated	809	Y
BJN 6712	Bus 40-Seated	809	N
BJN 6724	Bus 40-Seated	809	N
VJN 2231	Van 16-Seated	338	Y
VJN 2541	Van 16-Seated	338	Y

[Download CSV](#)

11 rows selected.

BOOKING_ORDER

BOOKING_NO	BUSMODEL	PICKUPDATE	PICKUPTIME	PICKUPADDRESS	DROPOFFADDRESS	PASSENGER	TRAVELROUTE
BK200342	Mini Bus 16-Seated	31-JAN-21	08:00 AM	UTM SKUDAI, JOHOR BAHRU	UTM SKUDAI, JOHOR BAHRU	10	UTM -> PULAI SPRING RESORT ->Paradigm Mall
BK200351	Mini Bus 19-Seated	18-JAN-21	8:00 AM	M25, Kolej Tun Dr Ismail, UTM Skudai, Johor	-	18	M25 to Paradigm Mall then to Sutera Mall back to pick up address
BK200352	Bus 25-Seated	20-JAN-21	9:00 AM	73, Jalan Cempaka 34/12, 81000 Kulai, Johor	Don Hu Jurassic Park Kampung Sabak Aur, 84000 Muar, Johor	25	Send us to Jalan Meriam, Pekan Muar, 84000 Muar, Johor after the Jurassic park Our hotel is at No 18-1, Taman Indah Jalan Haji Abdullah, 84000 Muar
BK200353	Bus 25-Seated	18-JAN-21	10:00 AM	Blok M01, Kolej Tun Dr Ismail, UTM Skudai, Johor	Blok M01, Kolej Tun Dr Ismail, UTM Skudai, Johor	49	Send us to The Mall, Mid Valley Southkey 1, Persiaran Southkey 1, Southkey, 80150 Johor Bahru, Johor Send us back to the drop off address at 9:00 PM

[Download CSV](#)

4 rows selected.

ORDER_

ORDER_NO	ORDER_DATE	ORDER_STATUS	TOTALPRICE	CUST_ID
OR10056024	27-JAN-21	Paid	1425	C210087
OR10056086	27-JAN-21	Unpaid	460	C210088
OR10056064	27-JAN-21	Unpaid	455	C210043

[Download CSV](#)

3 rows selected.

PAYMENT

TRANSACTION_NO	PAYMENT_DATE	PAYMENT_METHOD	TOTALPRICE	ORDER_NO
TN10056024	27-JAN-21	Debit/Credit Card	1425	OR10056024

[Download CSV](#)

BUS_BOOKING_ORDER

BOOKING_NO	ORDER_NO	PLATE_NO
BK200342	OR10056024	BJN 6712
BK200342	OR10056024	BJN 6724
BK200351	OR10056086	BJN 2731

[Download CSV](#)

3 rows selected.

1. Display Customer Info with customer ID C210087 (Menu Bar)

-----DISPLAY CUSTOMER INFO (CUSTOMER)-----

```
SELECT CUST_FNAME || ' ' || CUST_LNAME "Customer Name", 'ID: ' || CUST_ID "Customer ID"
FROM CUSTOMER
WHERE CUST_ID = 'C210087'
;
```

Customer Name	Customer ID
Ali Bin Ahmad	ID: C210087

2. Display the Bus details of model Mini Bus 19-seated

```
SELECT MODEL_, RENTAL, AVAILABILITY_
FROM BUS
WHERE MODEL_ = 'Mini Bus 19-Seated'
;
```

MODEL_	RENTAL	AVAILABILITY_
Mini Bus 19-Seated	468	Y
Mini Bus 19-Seated	468	Y

3. Display the Bus details of model Bus 40-seated

```
SELECT MODEL_, RENTAL, AVAILABILITY_
FROM BUS
WHERE MODEL_ = 'Bus 40-Seated'
;
```

MODEL_	RENTAL	AVAILABILITY_
Bus 40-Seated	809	Y
Bus 40-Seated	809	Y
Bus 40-Seated	809	N
Bus 40-Seated	809	N

4. Display the Bus details of model Van 16-seated

```
SELECT MODEL_, RENTAL, AVAILABILITY_
FROM BUS
WHERE MODEL_ = 'Van 16-Seated'
;
```

MODEL_	RENTAL	AVAILABILITY_
Van 16-Seated	338	Y
Van 16-Seated	338	Y

5. View unpaid order details (Customer)

-----VIEW UNPAID ORDER (CUSTOMER)-----

```
SELECT ORDER_NO, ORDER_DATE, ORDER_STATUS, TOTALPRICE
FROM ORDER_
WHERE ORDER_STATUS = "Unpaid"
AND CUST_ID = 'C210087'
;
```

ORDER_NO	ORDER_DATE	ORDER_STATUS	TOTALPRICE
OR10056024	27-JAN-21	Unpaid	1425

[Download CSV](#)

6. Search order details (Staff)

```
-----SEARCH ORDER (STAFF)-----
SELECT ORDER_NO
FROM ORDER_
WHERE ORDER_NO = 'OR10056071'
OR ORDER_NO LIKE 'OR10056%'
;
```

ORDER_NO
OR10056024
OR10056064
OR10056086

7. View paid order details (Customer)

```
-----VIEW PAID ORDER (CUSTOMER)-----

```

```
SELECT ORDER_NO, ORDER_DATE, ORDER_STATUS, TOTALPRICE
FROM ORDER_
WHERE ORDER_STATUS = 'Paid'
AND CUST_ID = 'C210087'
;
```

ORDER_NO	ORDER_DATE	ORDER_STATUS	TOTALPRICE
OR10056024	27-JAN-21	Paid	1425

8. Display paid order details with payment information and bus information (Customer)

```
SELECT o.ORDER_NO, o.ORDER_DATE, o.ORDER_STATUS, o.TOTALPRICE, p.TRANSACTION_NO, p.PAYMENT_DATE, p.PAYMENT_METHOD, p.TOTALPRICE AS "Amount Paid", bbo.PLATE_NO, b.MODEL_
FROM ORDER_ o JOIN PAYMENT p
ON o.ORDER_NO = p.ORDER_NO
JOIN BUS_BOOKING_ORDER bbo
ON bbo.ORDER_NO = p.ORDER_NO
JOIN BUS b
ON b.PLATE_NO = bbo.PLATE_NO
WHERE o.ORDER_NO = 'OR10056024'
;
```

ORDER_NO	ORDER_DATE	ORDER_STATUS	TOTALPRICE	TRANSACTION_NO	PAYMENT_DATE	PAYMENT_METHOD	Amount Paid	PLATE_NO	MODEL_
OR10056024	27-JAN-21	Paid	1425	TN10056024	27-JAN-21	Debit/Credit Card	1425	BIN 6712	Bus 40-Seated
OR10056024	27-JAN-21	Paid	1425	TN10056024	27-JAN-21	Debit/Credit Card	1425	BIN 6724	Bus 40-Seated

9. Display order details of order number OR10056024 (Staff)

```
SELECT c.CUST_ID, c.CUST_FNAME, bbo.BOOKING_NO, bo.BUSMODEL, bbo.PLATE_NO, o.ORDER_NO, o.ORDER_DATE, p.TOTALPRICE AS "Amount Paid"
FROM CUSTOMER c FULL JOIN ORDER_ o
ON c.CUST_ID = o.CUST_ID
FULL JOIN PAYMENT p
ON o.ORDER_NO = p.ORDER_NO
FULL JOIN BUS_BOOKING_ORDER bbo
ON bbo.ORDER_NO = p.ORDER_NO
FULL JOIN BOOKING_ORDER bo
ON bbo.BOOKING_NO = bo.BOOKING_NO
WHERE o.ORDER_NO = 'OR10056024'
;
```

CUST_ID	CUST_FNAME	BOOKING_NO	BUSMODEL	PLATE_NO	ORDER_NO	ORDER_DATE	Amount Paid
C210087	Ali	-	-	-	OR10056024	27-JAN-21	1425

10. Calculate the percentage of discount for the order OR10056086 (Staff)

-----CALCULATE THE DISCOUNT RATE (STAFF)-----

```
SELECT DISTINCT o.ORDER_NO, ROUND(TO_CHAR(b.RENTAL-o.TOTALPRICE)/b.RENTAL*100, 2) AS "Percentage of Discount"
FROM BUS b JOIN BUS_BOOKING_ORDER bbo
ON b.PLATE_NO = bbo.PLATE_NO
JOIN ORDER_ o
ON o.ORDER_NO = bbo.ORDER_NO
WHERE o.ORDER_NO = 'OR10056086'
AND b.RENTAL = 468
;
```

ORDER_NO	Percentage of Discount
OR10056086	4.91

5.3 User Manual

Welcome to NW Bus Rental.

Sign Up

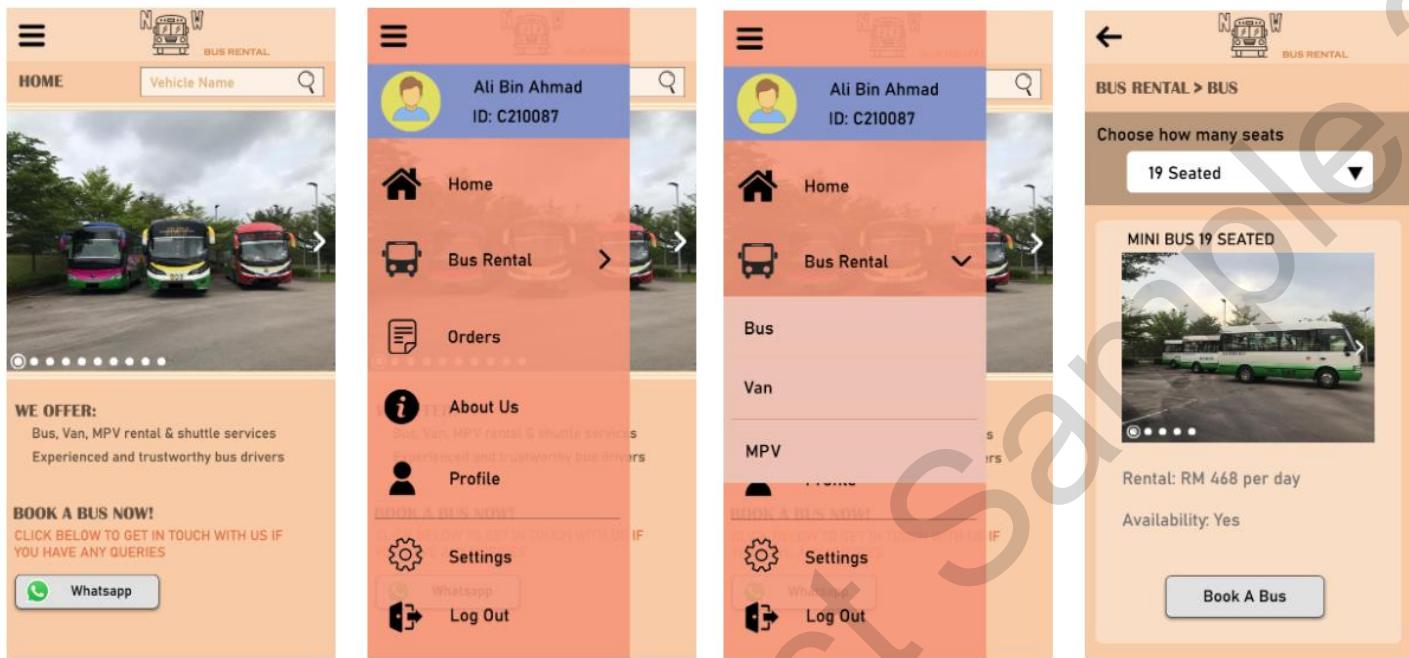
NW Bus Rental mobile application will require the customers to sign up an account by using their email before they can start to use the system. The staff will also have to sign up an account as well. For new customers, personal detail like first name, last name, phone number, email, password and security question are required to be filled. While for the staff, they will sign up an account and fill in the username with their Staff ID. This is for easy monitoring and managing purposes.



Log In

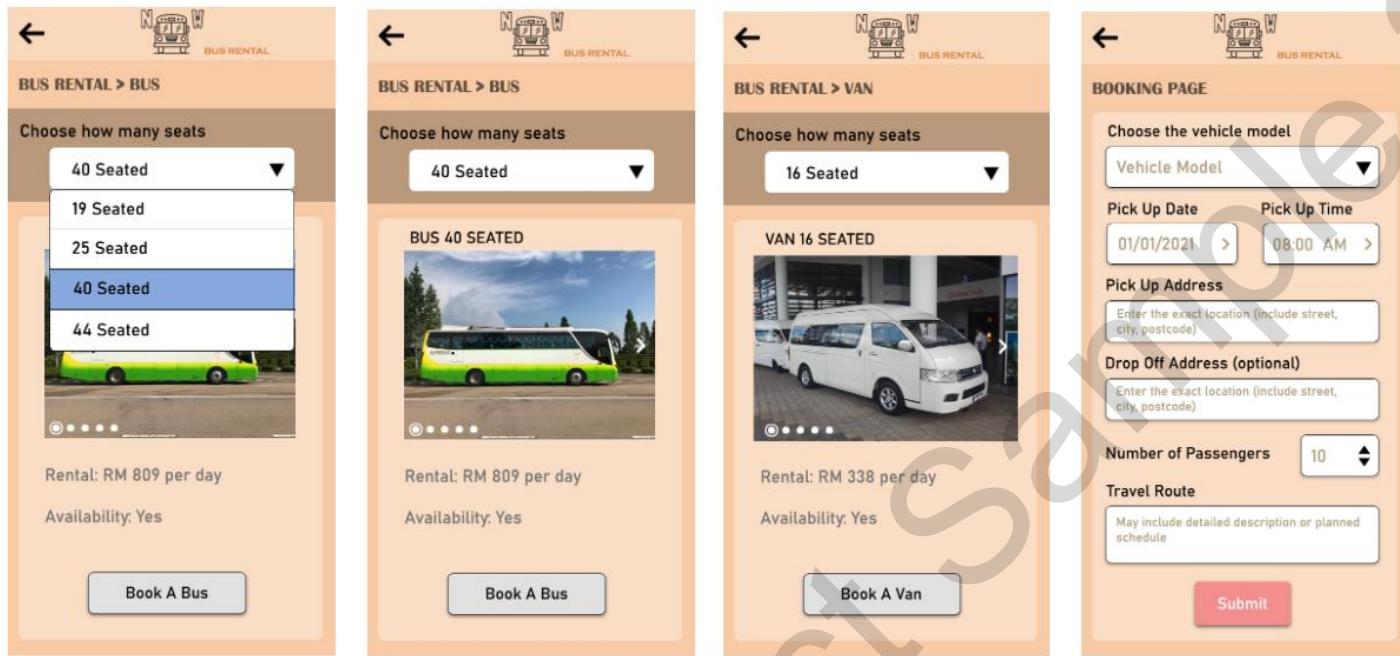
Customers - Login by using email or phone number and password.

Staff - Login by using username and password.



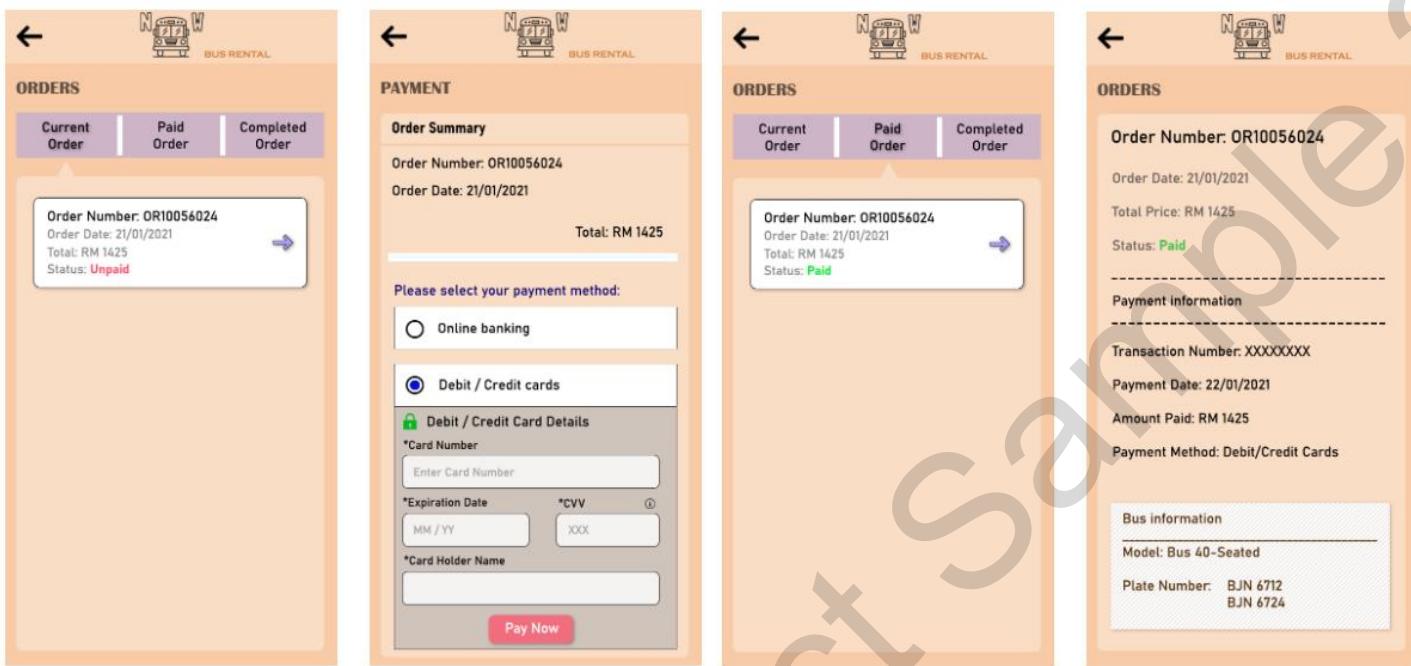
View

- Customers can contact us directly on the main page via WhatsApp for any enquiries.
- Go through the Menu bar by pressing the menu button on the top left corner.
- View the rental by choosing the categories: Bus, Van and MPV.
- Inside each category, choose the number of seats in the drop down list.
- Rental (per day) and availability will be displayed.
- Click on the “Book A Bus” to navigate to the booking interface.



Booking

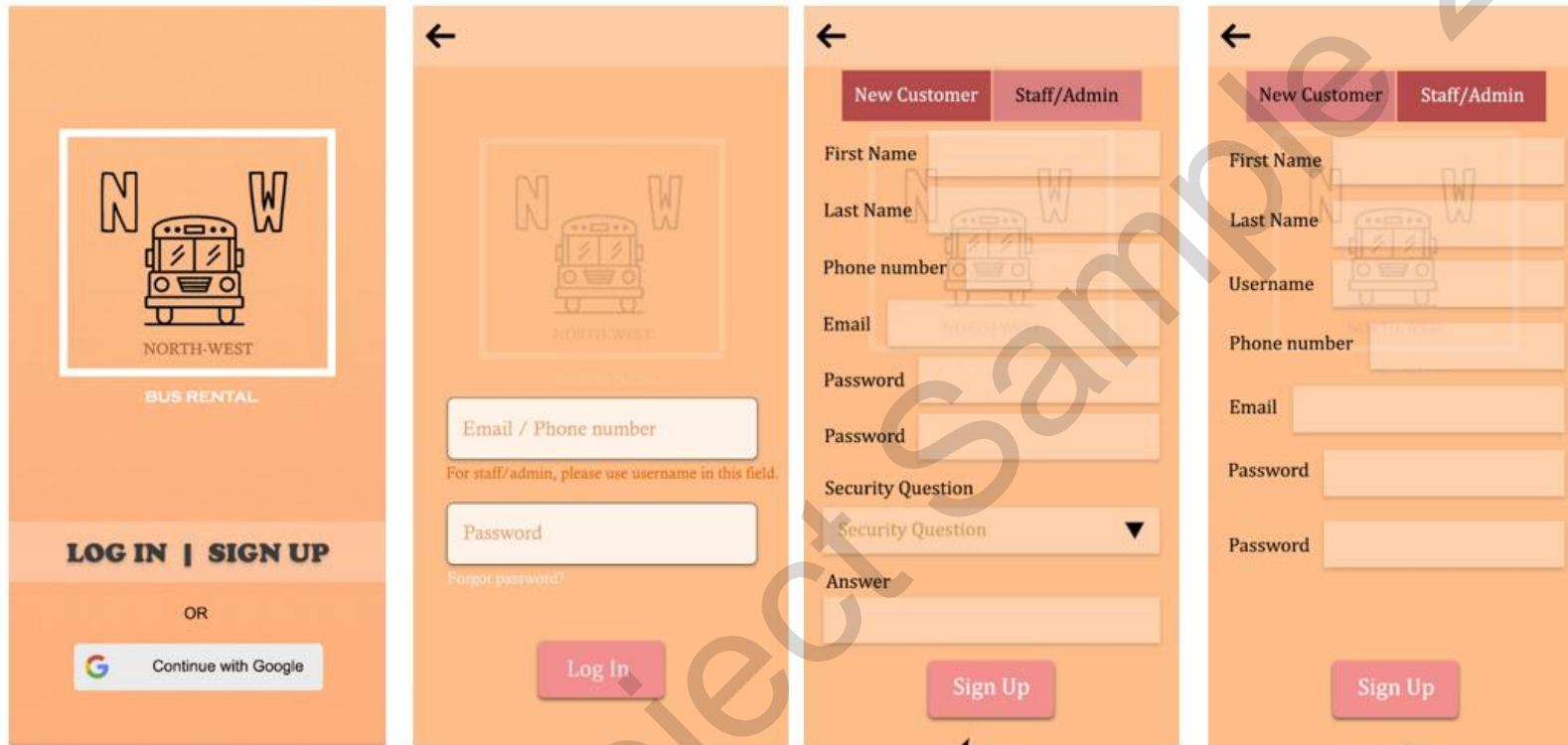
- To book a bus, customers need to enter the booking details such as bus model, pick up date, pick up time, pick up address, drop off address, number of passengers and travel route.
- All fields are required to be filled except the drop off address (optional).
- Travel route may include detailed description or schedule.
- Click ‘Submit’ once you have done.



Payment

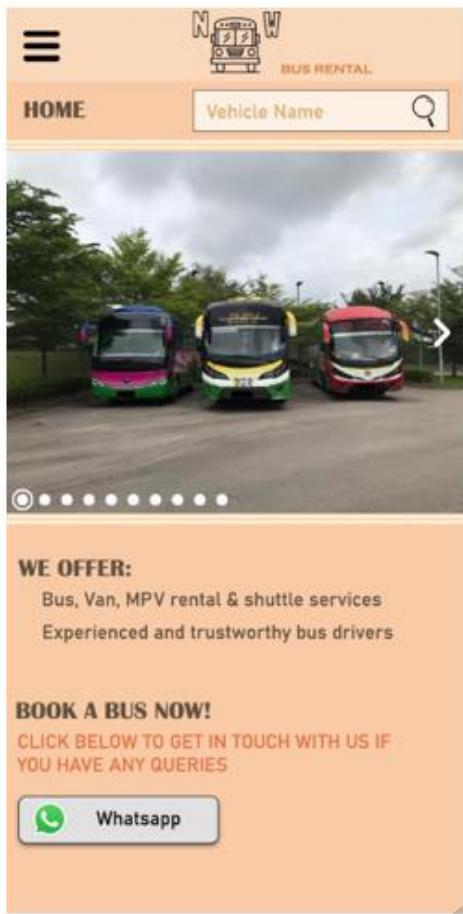
- Customers can pay for their order once it has been verified by our staff/admin. (Current Order)
- Customers can pay via online banking or debit/credit cards.
- Customers can view the bus information if and only if they have made the payment. (Paid Order)
- Completed Order is similar to the order history.

5.4 Interfaces with SQL Statements



```
INSERT INTO CUSTOMER  
VALUES ('C210087', 'Ali', 'Bin  
Ahmad', 0128889999,  
'aliahmad@gmail.com', '123456',  
'ANSWER')  
;
```

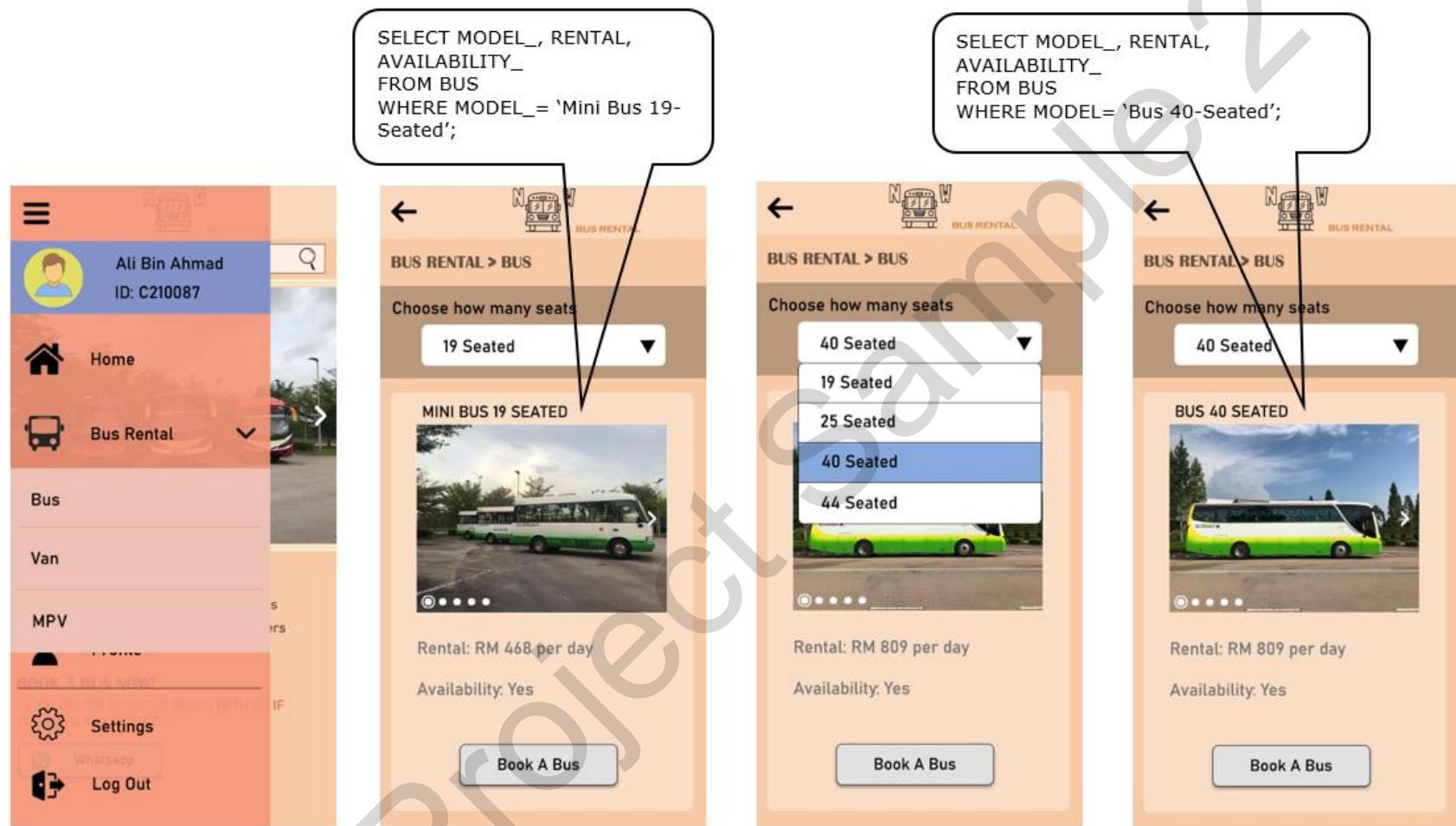
```
INSERT INTO STAFF  
VALUES ('Peter',  
'Tan', 'STF10062A', 0123456789,  
'peter@gmail.com', '123456')  
;
```



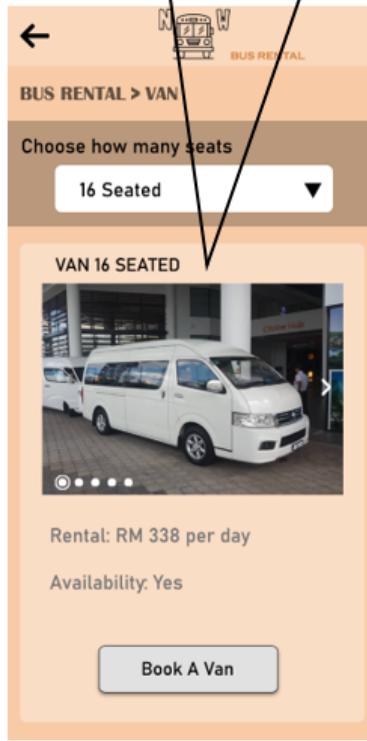
```
SELECT CUST_FNAME || ' ' ||  
CUST_LNAME, 'ID: ' || CUST_ID  
FROM CUSTOMER  
WHERE CUST_ID = 'C210087'  
;
```



```
UPDATE CUSTOMER  
SET CUST_PHONE_NO=0134567890  
WHERE CUST_ID = 'C210087';
```



```
SELECT MODEL_, RENTAL, AVAILABILITY_
FROM BUS
WHERE MODEL_ = 'Van 16-Seated'
;
```



BOOKING PAGE

Choose the vehicle model

Vehicle Model

Pick Up Date
01/01/2021 >

Pick Up Time
08:00 AM >

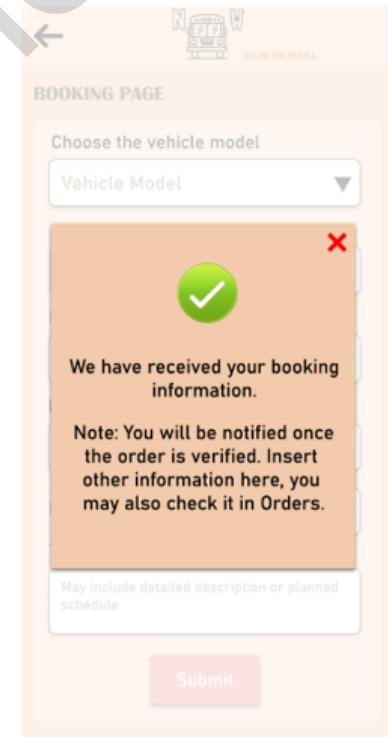
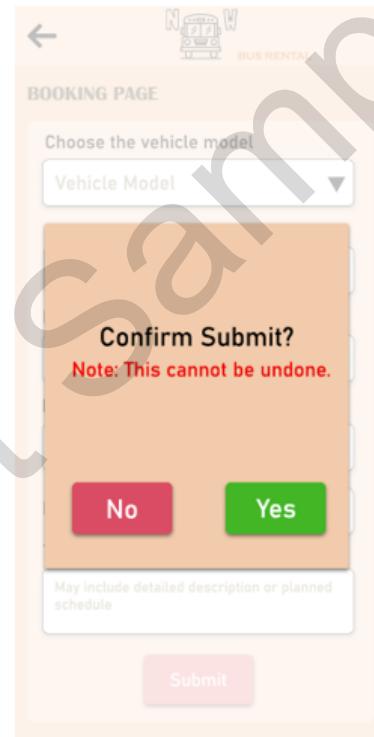
Pick Up Address
Enter the exact location (include street, city, postcode)

Drop Off Address (optional)
Enter the exact location (include street, city, postcode)

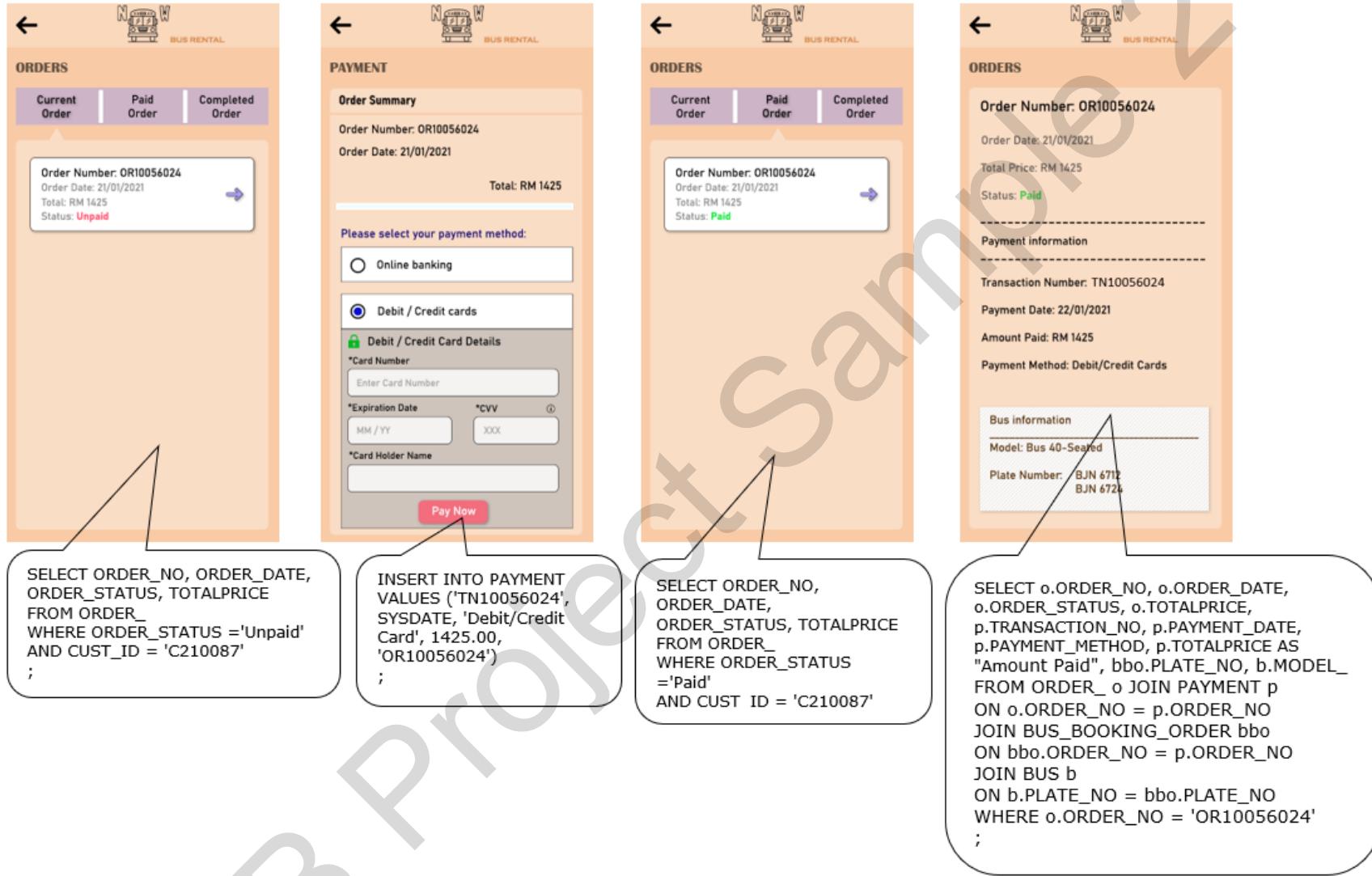
Number of Passengers
10

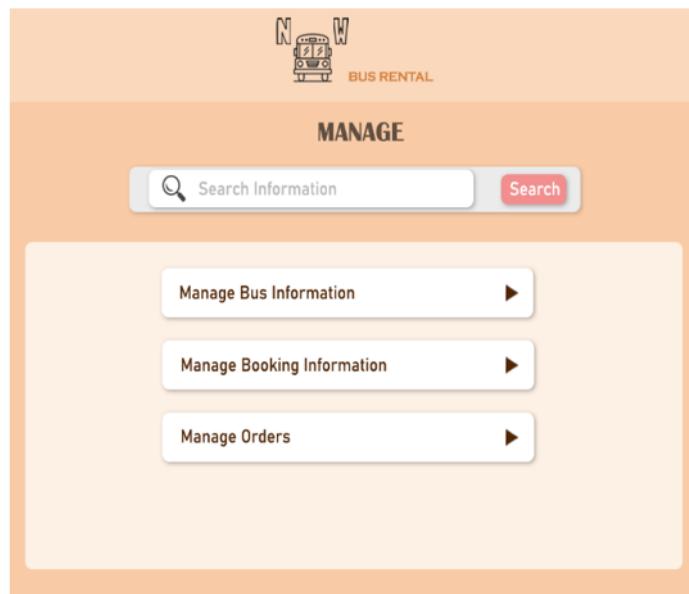
Travel Route
May include detailed description or planned schedule

Submit

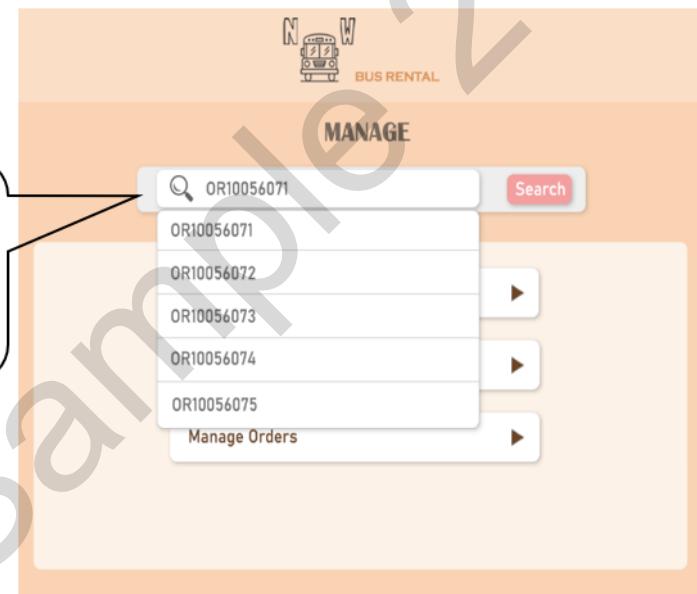


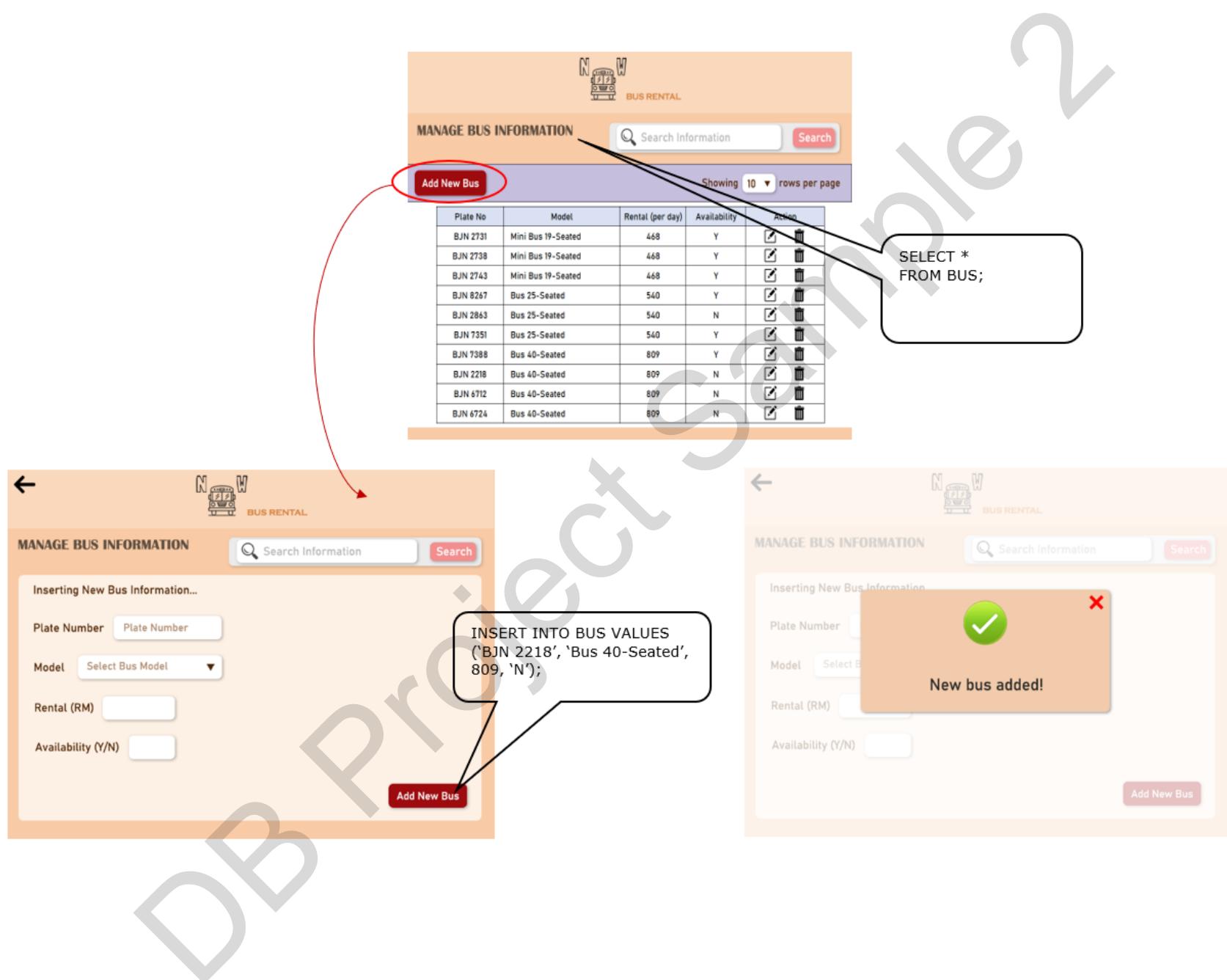
```
INSERT INTO BOOKING_ORDER
VALUES ('BK200351', 'Mini Bus 19-Seated', TO_DATE ('18/01/2021',
'DD/MM/YYYY'), '8:00 AM', 'M25, Kolej Tun Dr Ismail, UTM Skudai, Johor', '-',
18, 'M25 to Paradigm Mall then to Sutera Mall back to pick up address')
;
```





```
SELECT ORDER_NO  
FROM ORDER_  
WHERE ORDER_NO  
='OR10056071'  
OR ORDER_NO LIKE  
'OR10056%'  
;
```





MANAGE BUS INFORMATION

Updating Bus Information...

Plate Number: BJJ 2218

Model: Bus 40-Seated

Rental (RM): 809

Availability (Y/N): Y

Update

MANAGE BUS INFORMATION

Updating Bus Information

Plate Number: BJJ 2218

Model: Bus 40-Seated

Rental (RM): 809

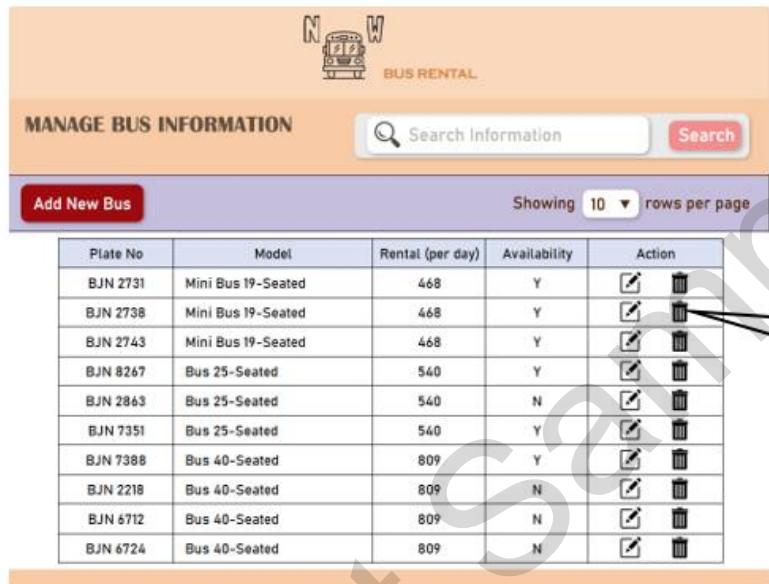
Availability (Y/N): Y

Bus information updated!

Update

UPDATE BUS
SET AVAILABILITY_= 'Y',
WHERE PLATE_NO= 'BJJ 2218';

Sample 2



MANAGE BUS INFORMATION

Search information

Add New Bus Showing 10 rows per page

Plate No	Model	Rental (per day)	Availability	Action
BJN 2731	Mini Bus 19-Seated	468	Y	<input checked="" type="checkbox"/> <input type="button" value="Delete"/>
BJN 2738	Mini Bus 19-Seated	468	Y	<input checked="" type="checkbox"/> <input type="button" value="Delete"/>
BJN 2743	Mini Bus 19-Seated	468	Y	<input checked="" type="checkbox"/> <input type="button" value="Delete"/>
BJN 8267	Bus 25-Seated	540	Y	<input checked="" type="checkbox"/> <input type="button" value="Delete"/>
BJN 2863	Bus 25-Seated	540	N	<input checked="" type="checkbox"/> <input type="button" value="Delete"/>
BJN 7351	Bus 25-Seated	540	Y	<input checked="" type="checkbox"/> <input type="button" value="Delete"/>
BJN 7388	Bus 40-Seated	809	Y	<input checked="" type="checkbox"/> <input type="button" value="Delete"/>
BJN 2218	Bus 40-Seated	809	N	<input checked="" type="checkbox"/> <input type="button" value="Delete"/>
BJN 6712	Bus 40-Seated	809	N	<input checked="" type="checkbox"/> <input type="button" value="Delete"/>
BJN 6724	Bus 40-Seated	809	N	<input checked="" type="checkbox"/> <input type="button" value="Delete"/>

Project Sample



MANAGE BUS INFORMATION

Search information

Add New Bus

Showing 10 rows per page

Plate No	Model	Rental (per day)	Availability	Action
BJN 2731	Mini Bus 19-Seated	468	Y	<input checked="" type="checkbox"/> <input type="button" value="Delete"/>
BJN 2738	Mini Bus 19-Seated	468	Y	<input checked="" type="checkbox"/> <input type="button" value="Delete"/>
BJN 2743	Mini Bus 19-Seated	468	Y	<input checked="" type="checkbox"/> <input type="button" value="Delete"/>
BJN 8267	Bus 25-Seated	540	Y	<input checked="" type="checkbox"/> <input type="button" value="Delete"/>
BJN 2863	Bus 25-Seated	540	N	<input checked="" type="checkbox"/> <input type="button" value="Delete"/>
BJN 7351	Bus 25-Seated	540	Y	<input checked="" type="checkbox"/> <input type="button" value="Delete"/>
BJN 7388	Bus 40-Seated	809	Y	<input checked="" type="checkbox"/> <input type="button" value="Delete"/>
BJN 2218	Bus 40-Seated	809	N	<input checked="" type="checkbox"/> <input type="button" value="Delete"/>
BJN 6712	Bus 40-Seated	809	N	<input checked="" type="checkbox"/> <input type="button" value="Delete"/>
BJN 6724	Bus 40-Seated	809	N	<input checked="" type="checkbox"/> <input type="button" value="Delete"/>

SELECT *
FROM BOOKING_ORDER
;

Booking No	Bus Model	Pick-Up Date	Pick-Up Time	Pick-Up Address	Drop-Off Address	No of passengers	Travel Route
BK200351	Min Bus 19-Seated	16/05/2021	8:00 AM	MES, Kolej Tun Dr Ismail, UTM Skudai, Johor	-	18	MES to Paradise Mall then to Sutera Mall back to pick up address
BK200352	Bus 25-Seated	25/05/2021	9:00 AM	T3, Jalan Cempaka 34/70, 80000 Kulai, Johor	Guru Muhi Jurasik Park Kompleks Sakuk Auri, 84000 Muar, Johor	25	Sent to us Jalan Merlimau, Pekan Muar, 84000 Muar, Johor after the jurasik park. Our hotel is at No 18-1, Taman Indah Jalan Haj Ahmad Ibrahim, 84000 Muar, Johor.
BK200353	Bus 25-Seated	25/05/2021	10:00 AM	Block M3, Kolej Tun Dr Ismail, UTM Skudai, Johor	Block M3, Kolej Tun Dr Ismail, UTM Skudai, Johor	49	Sent to us The Mall, Mid Valley Southkey 1 Persiaran Southkey 1, Southkey, 80100 Johor Bahru, Johor Send us back to the drop off address at 9:00 PM
BK200354	Bus 40-Seated	23/05/2021	12:00 PM	FKE-FFF Bus Stop - UTM Skudai, Johor	Classic Hotel No 1P Jalan Ali Muar, 84000 Muar, Malaysia	38	1:30 PM Sultan Ismail Bridge 2:30 PM Tebing Emas Park 3:30 PM Sultan Abdul Jamek Mosque
BK200355	Min Bus 19-Seated	23/05/2021	8:00 PM	Paragon Mall, Jalan Berlingkat Skudai, Taman Budi Merwah, 81200 Johor Bahru, Johor	Taman Rekreasi Tasek Bahau, T2000 Bahau, Negeri Sembilan	17	Just send to the drop off address.
BK200356	Bus 40-Seated	30/05/2021	10:30 AM	MZT, Kolej Tun Dr Ismail, UTM Skudai, Johor	Adventure Waterpark, Persiaran Pantai, Desaru Coast, 89100 Bandar Pantai, Johor, Malaysia	40	MZT KT01 → Desaru Coast 4:30 PM from Desaru Coast → MZT KT01

Booking Confirmed!
The Order No is OR10056086.
Please enter the total price: 468

Confirm

INSERT INTO ORDER_
VALUES ('OR10056086', SYSDATE, 'Unpaid',
468.00, 'C210088')
;

Sample 2

MANAGE ORDERS

Search Information Search

Order No	Customer ID	Order Date	Order Status	Total Price	Action
OR10056058	C210015	21/01/2021	Completed	468	View <input type="checkbox"/>
OR10056059	C210024	21/01/2021	Unpaid	1436	View <input type="checkbox"/>
OR10056060	C210027	21/01/2021	Paid	1518	View <input checked="" type="checkbox"/>
OR10056061	C210019	21/01/2021	Unpaid	809	View <input type="checkbox"/>
OR10056062	C210076	21/01/2021	Paid	809	View <input checked="" type="checkbox"/>
OR10056063	C210048	21/01/2021	Paid	378	View <input checked="" type="checkbox"/>
OR10056064	C210043	22/01/2021	Unpaid	455	View <input type="checkbox"/>
OR10056065	C210054	22/01/2021	Unpaid	910	View <input type="checkbox"/>
OR10056066	C210063	22/01/2021	Unpaid	540	View <input type="checkbox"/>
OR10056067	C210037	22/01/2021	Unpaid	1425	View <input type="checkbox"/>

MANAGE ORDERS

Search Information Search

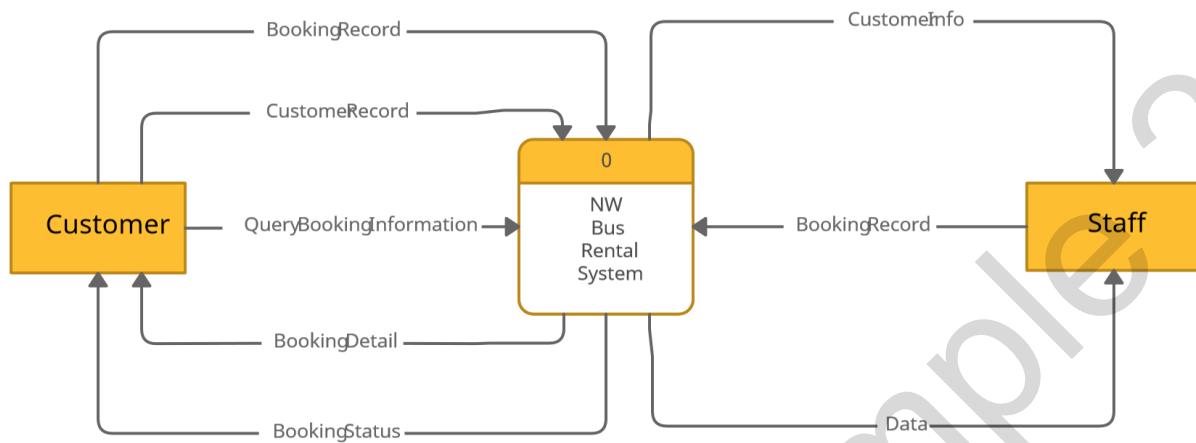
Order No	Customer ID	Order Date	Order Status	Total Price	Action
OR10056058	C210015	21/01/2021	Paid	468	View <input type="checkbox"/>
OR10056059	C210024	21/01/2021	Paid	1436	View <input checked="" type="checkbox"/>
OR10056060	C210027	21/01/2021	Paid	1518	View <input checked="" type="checkbox"/>
OR10056061	C210019	21/01/2021	Unpaid	809	View <input type="checkbox"/>
OR10056062	C210076	21/01/2021	Paid	809	View <input checked="" type="checkbox"/>
OR10056063	C210048	21/01/2021	Paid	378	View <input checked="" type="checkbox"/>
OR10056064	C210043	22/01/2021	Unpaid	455	View <input type="checkbox"/>
OR10056065	C210054	22/01/2021	Unpaid	910	View <input type="checkbox"/>
OR10056066	C210063	22/01/2021	Unpaid	540	View <input type="checkbox"/>
OR10056067	C210037	22/01/2021	Unpaid	1425	View <input type="checkbox"/>

SELECT *
FROM ORDER_
;

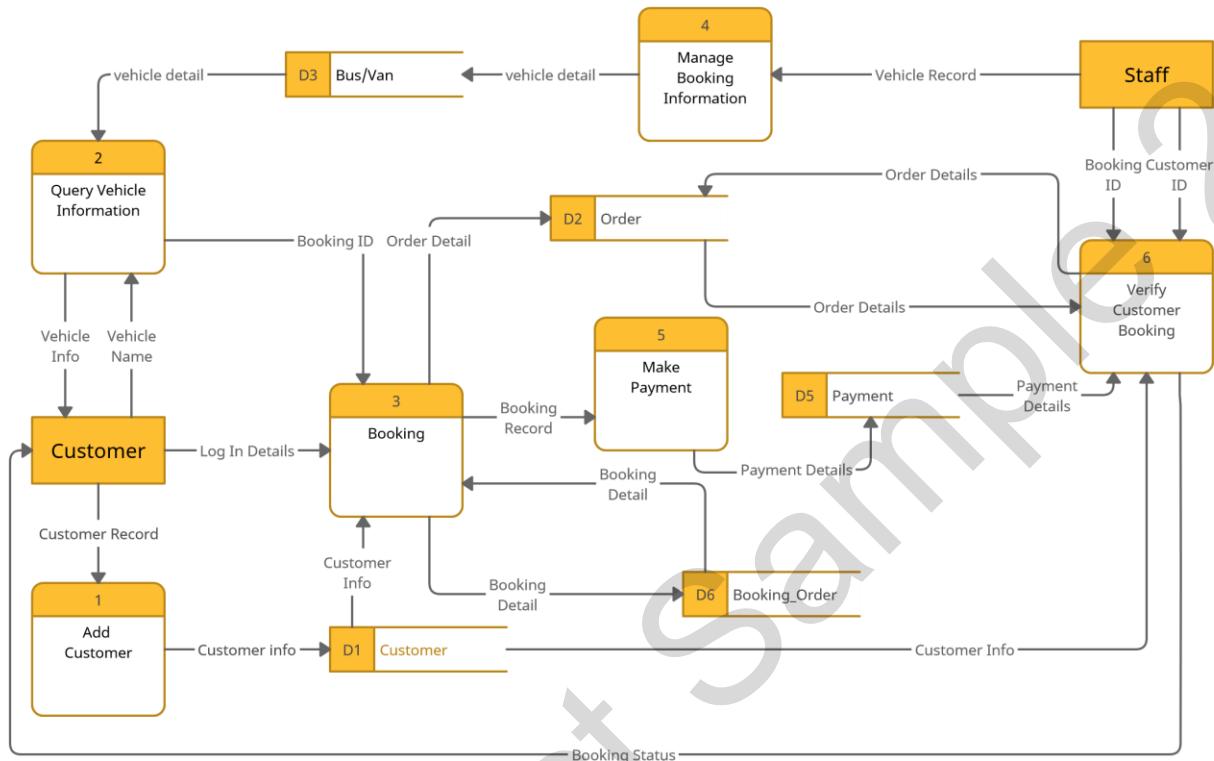
INSERT INTO BUS_BOOKING_ORDER
VALUES ('BK200342', 'OR10056024', 'BJN
6724')
;

5.5 Data Flow Diagram (DFD)

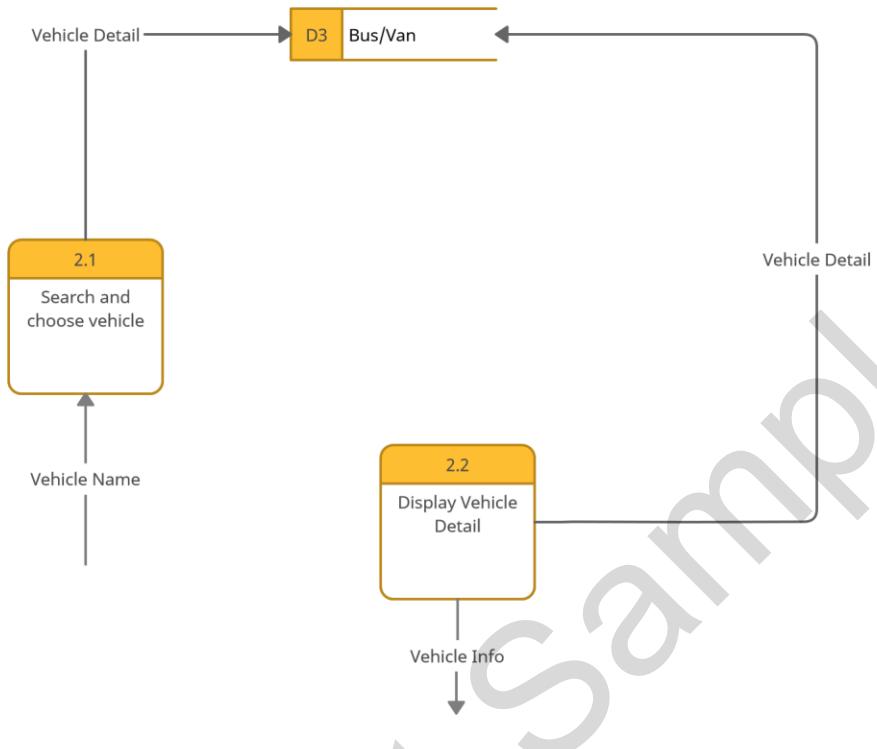
5.5.1 Context Diagram



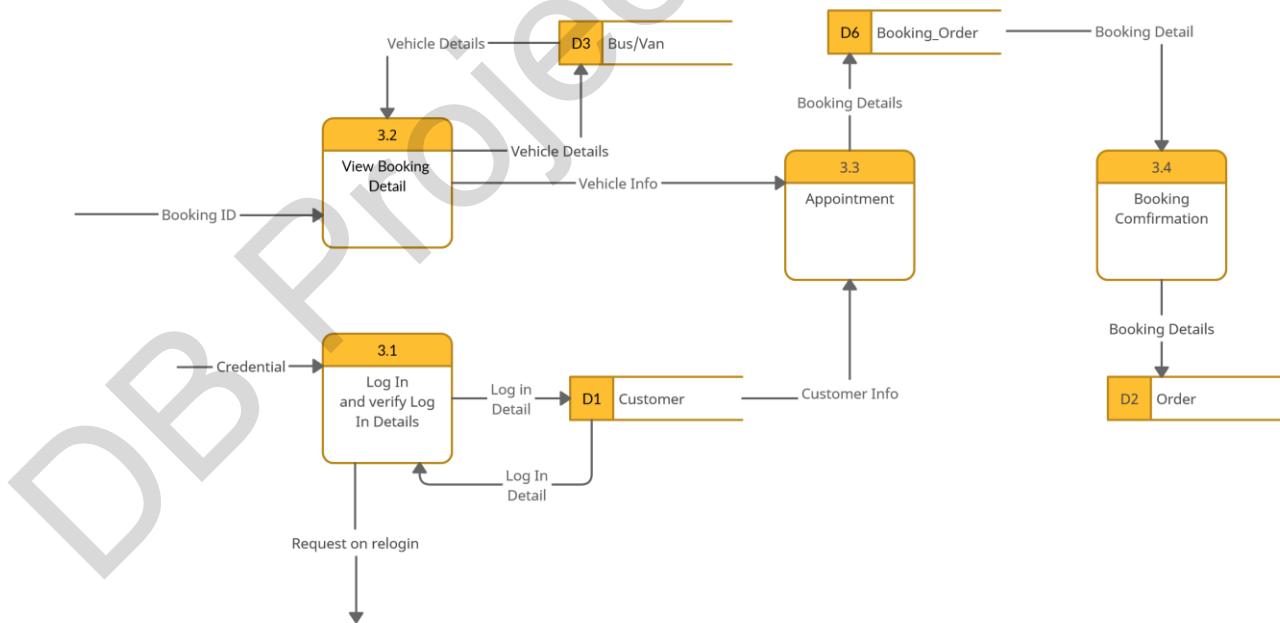
5.5.2 Diagram 0



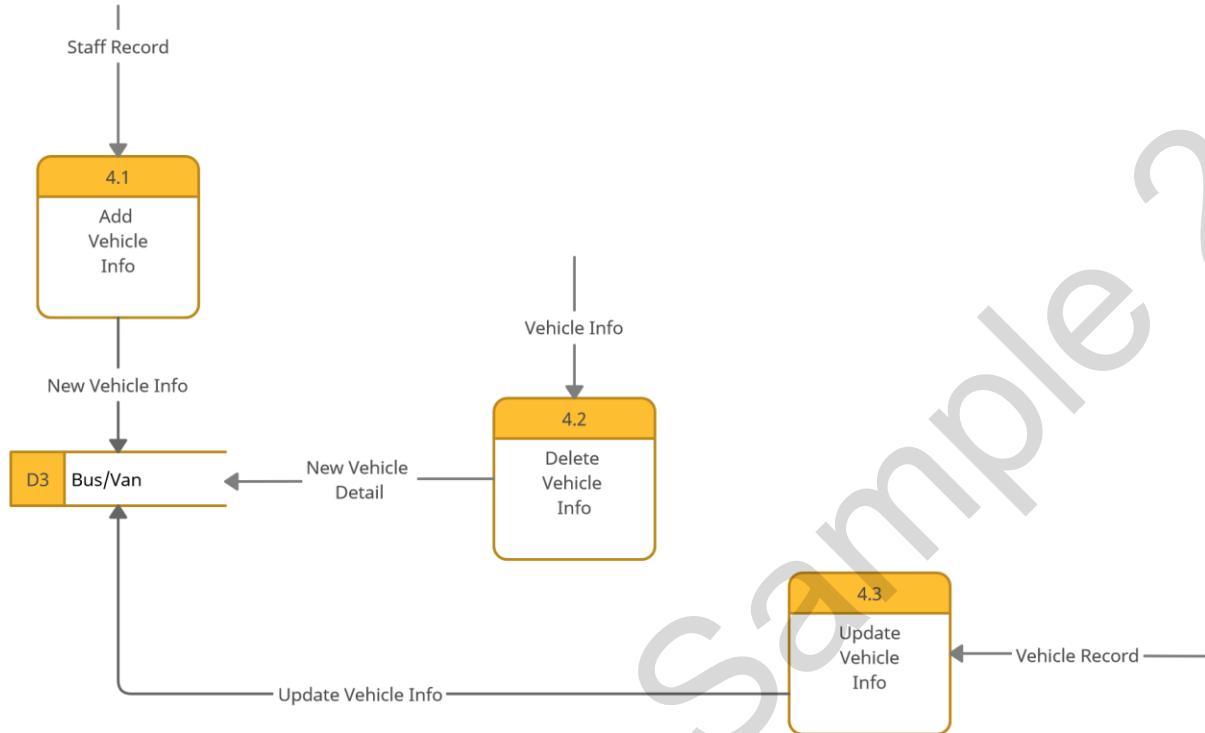
5.5.3 Child Diagram of Process 2



5.5.4 Child Diagram of Process 3



5.5.5 Child Diagram of Process 4



5.5.6 Child Diagram of Process 6

