

Agricultural Heavy Machinery Renting/Sales Management System

Software Design Description

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Section 1. Overview

1.1 Purpose

The purpose of the Object-Oriented Software Design Description (SSD) document is to outline the design views of the project which will satisfy functional and nonfunctional requirements stated in the SRS Document of Agricultural Heavy Machinery Renting/Sales Management System. Purpose of this document is serving as a guideline throughout development phase of the project for developers. This Software Design Description (SDD) document provides necessary information about the project Agricultural Heavy Machinery Renting/Sales Management System. This document includes design principles of the software with its requirements, functionalities and necessary definitions. These information is aimed to guide any programmer to understand our design and be an assistant in the development phase. This document provides a comprehensive architectural overview of the system, using a number of different architectural views to depict different aspects of the system. It is intended to capture and convey the significant architectural decisions which have been made on the system.

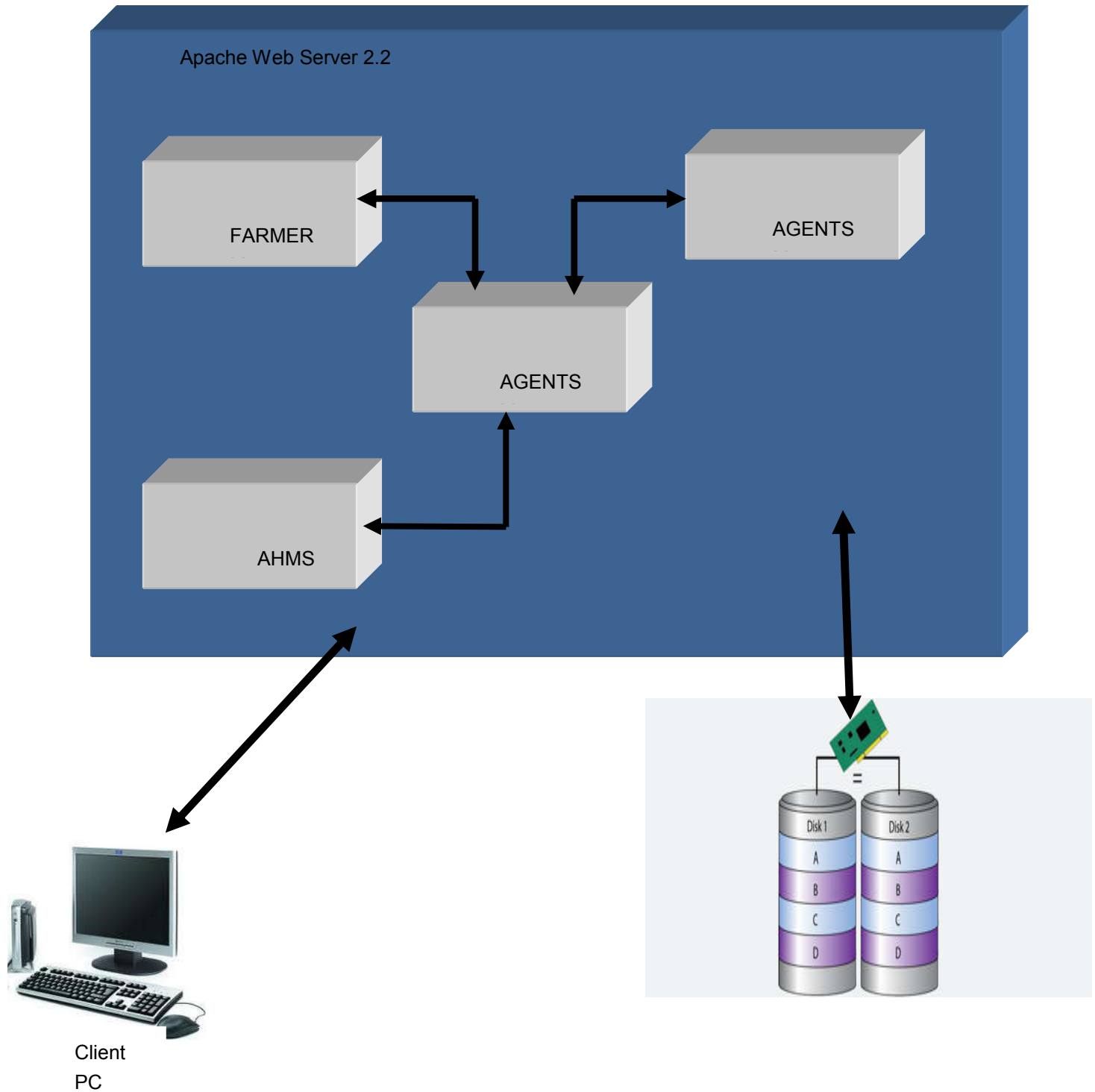
The main audience of this document includes the developers of this project and the client team members. Developers are supposed to use this document in the development phase to the structure and design of each component.

1.2 Scope

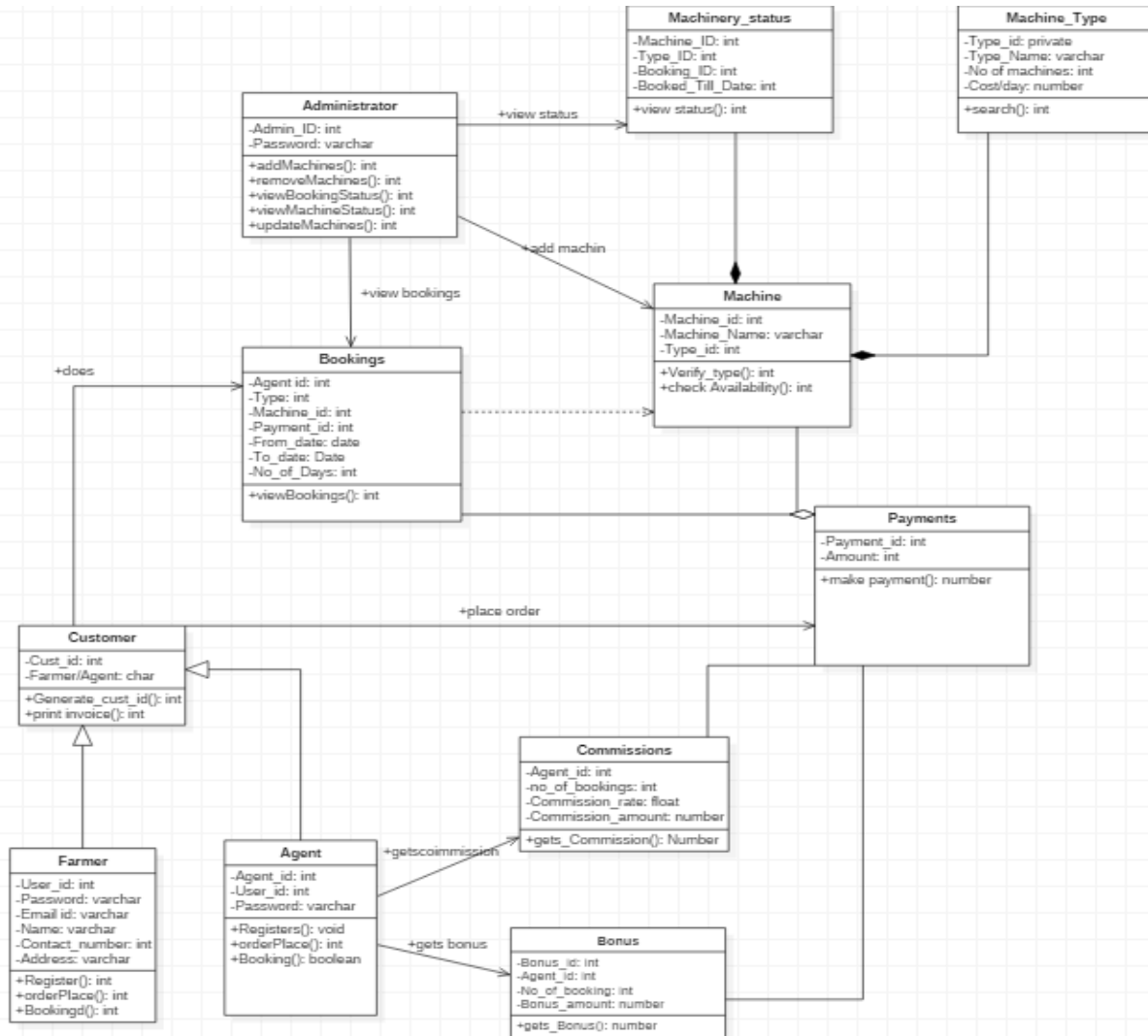
Agricultural heavy machineries sales and renting management system aims to automate the following process:

- Availability of machineries at low rent rates throughout the year by predictions using previous transactions
- Discounts on machineries if purchased in large scale.
- Status tracking of rented machineries per day basis/ per week/ per month basis
- Universalization of commission rates
- Region wise availability and need for machineries report generation.
- Bonus for agents based on the number of machineries he/she books.

Section 2. System Architecture

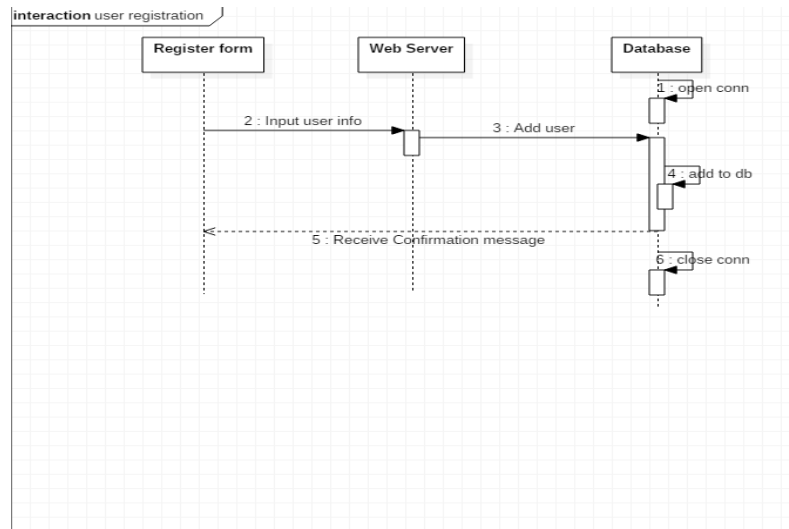


Section 3. Class Diagram

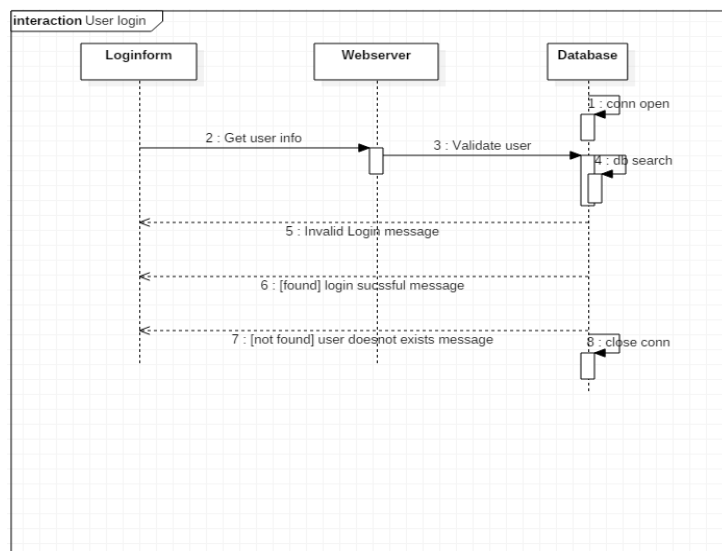


Section 4. Sequence Diagrams and Descriptions

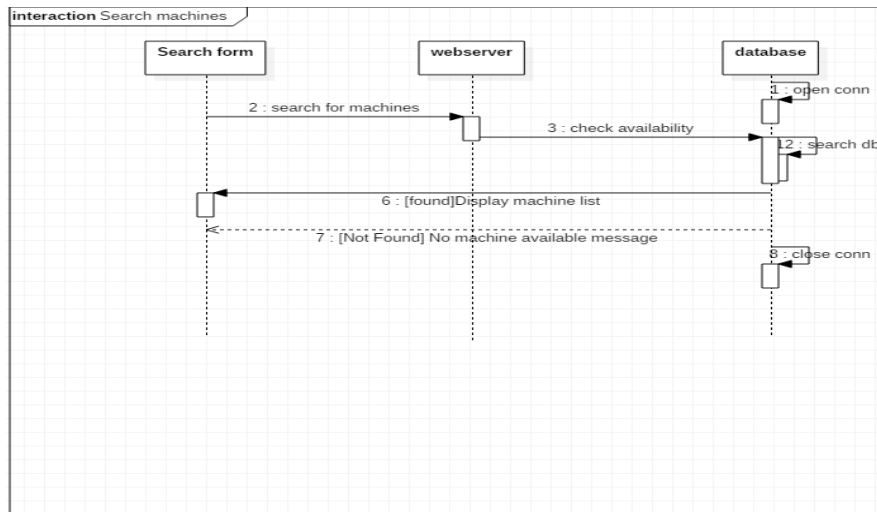
4.1 Sequence Diagram for Registration Use Case



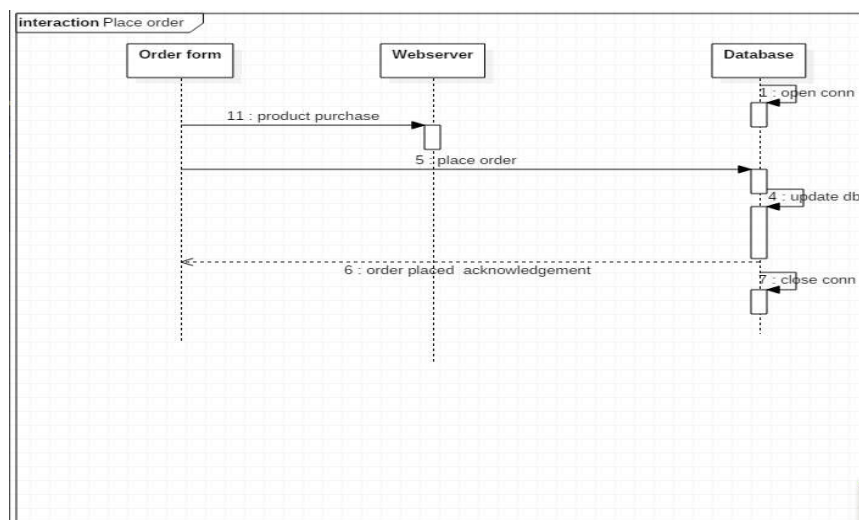
4.2 Sequence Diagram for User Login Use Case



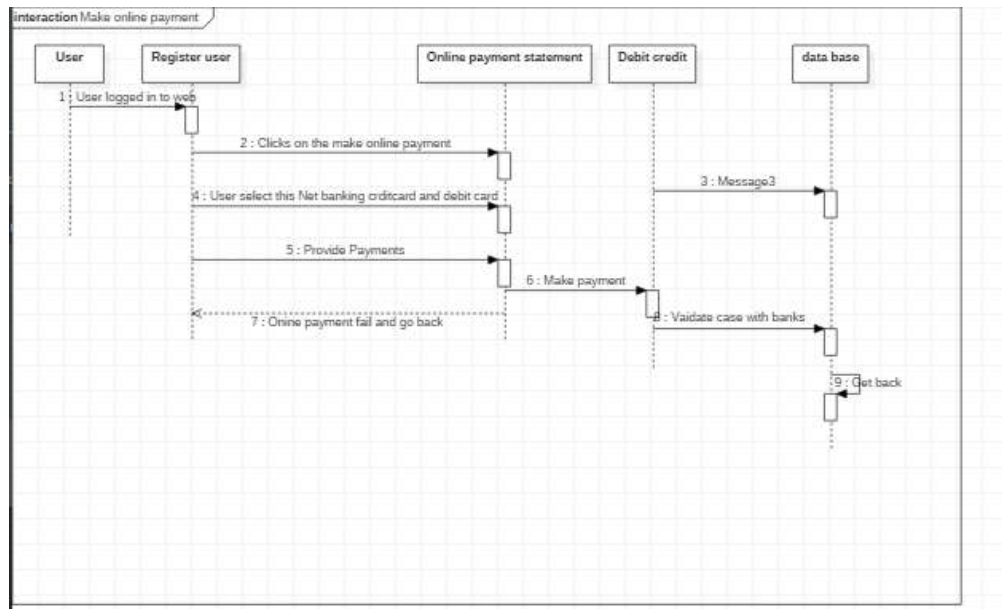
4.3 Sequence Diagram for Search Machine Use Case



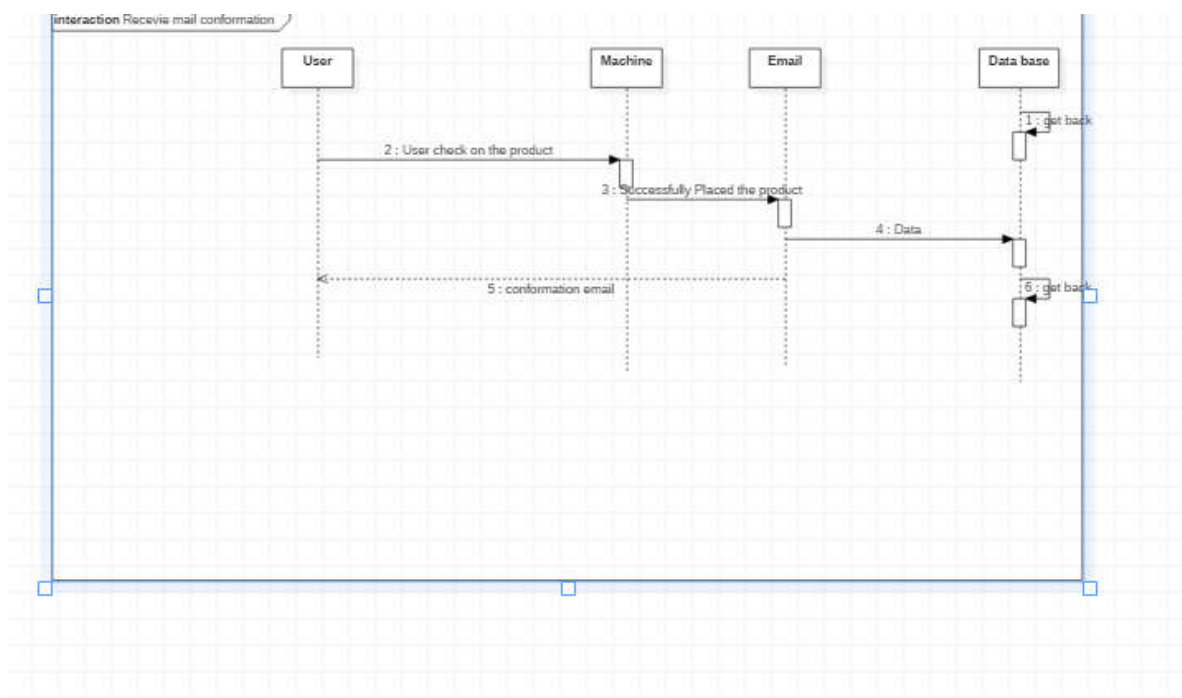
4.4 Sequence Diagram for PlaceOrder Use Case



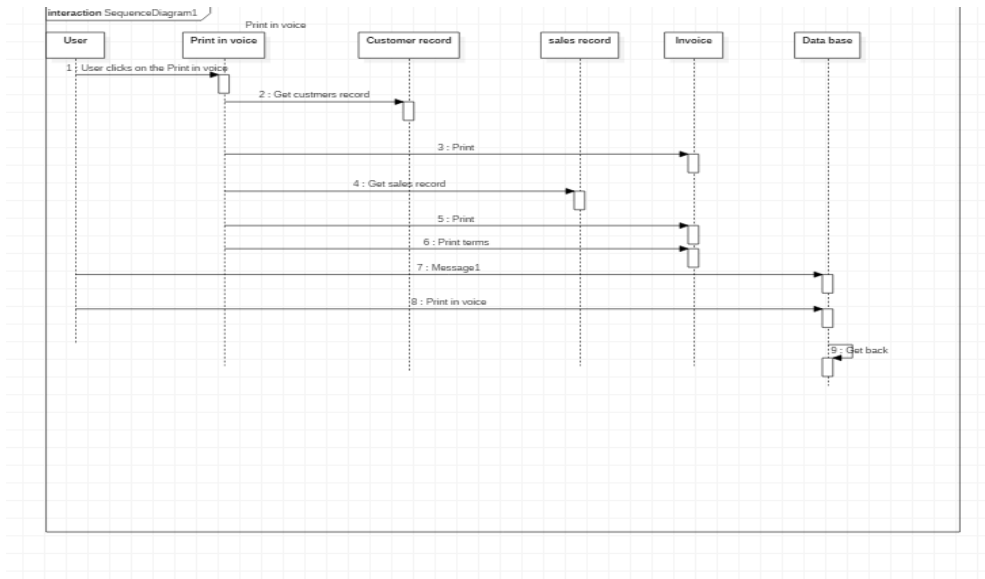
4.5 Sequence Diagram for make online payment Use Case



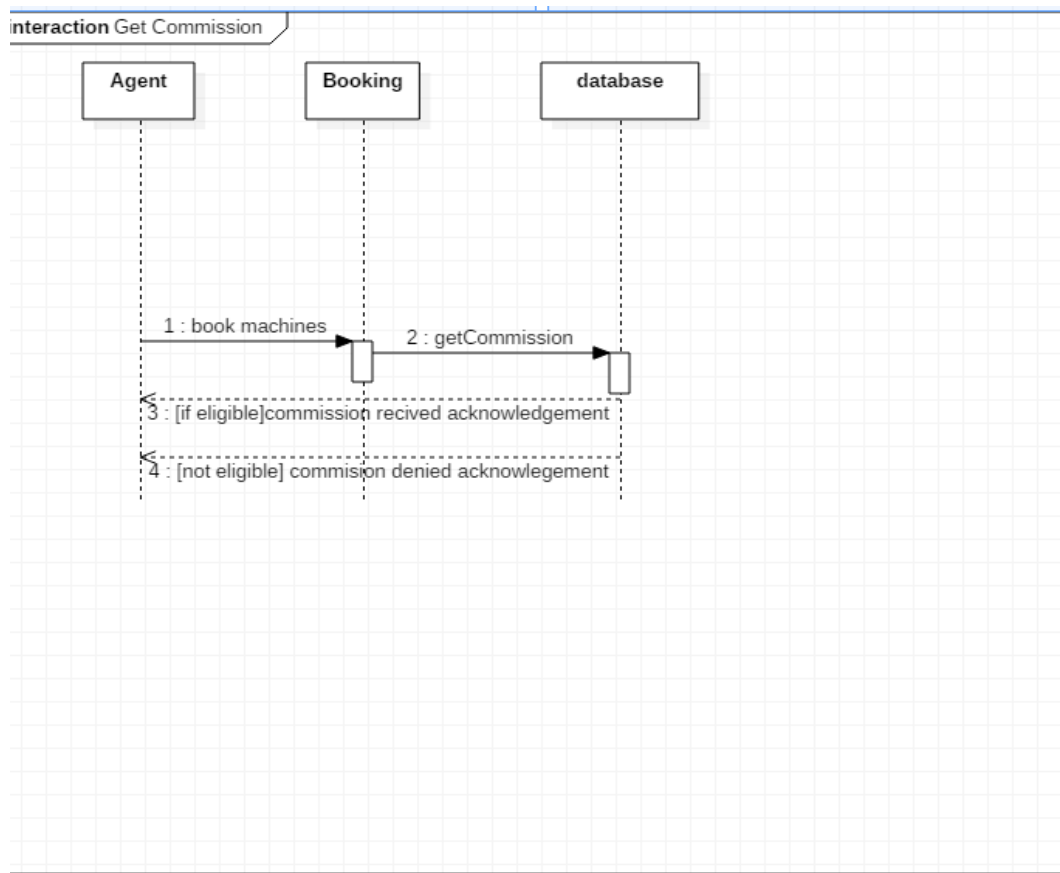
4.6 Sequence Diagram for email confirmation Use Case



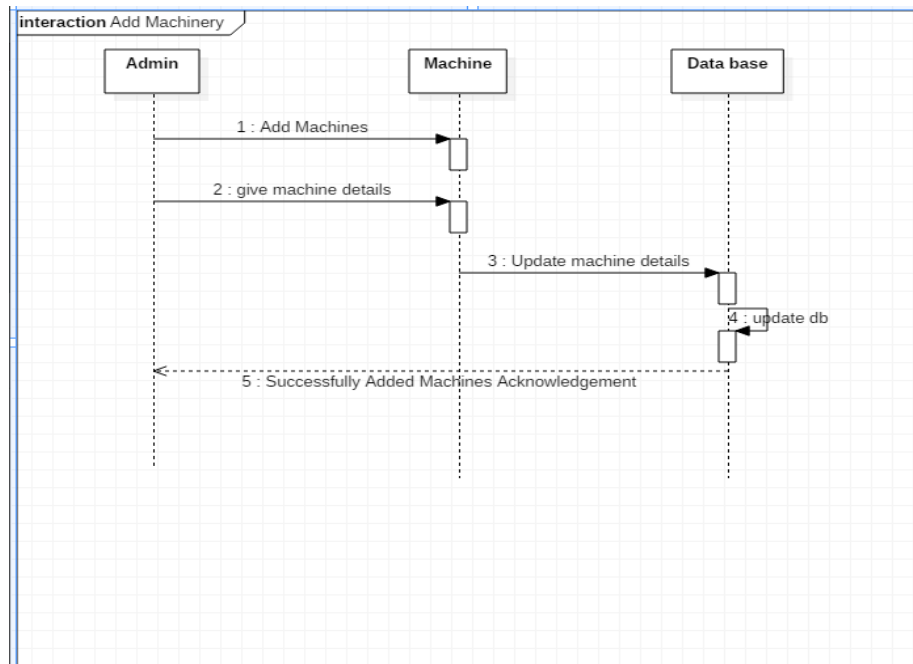
4.7 Sequence Diagram for Print Invoice Use Case



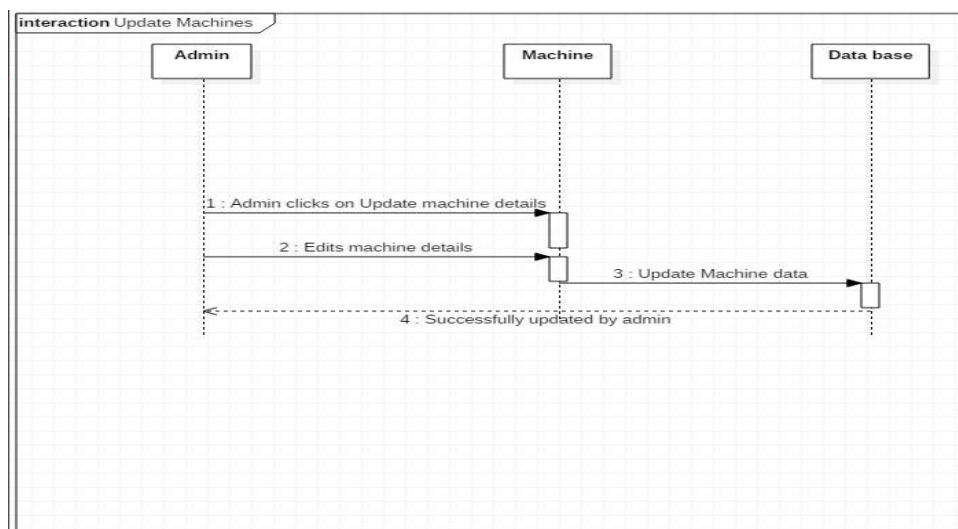
4.8 Sequence Diagram for Gets commission Use Case



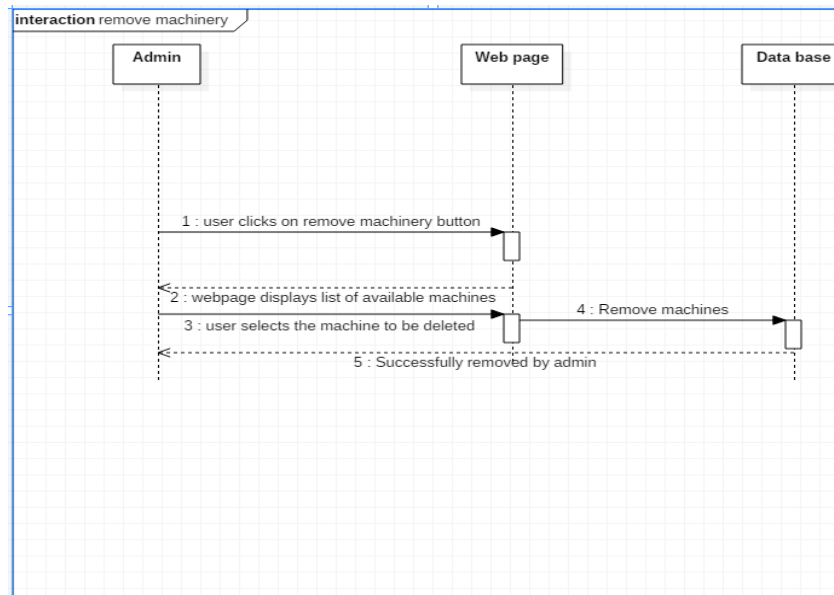
4.9 Sequence Diagram for add machinery Use Case



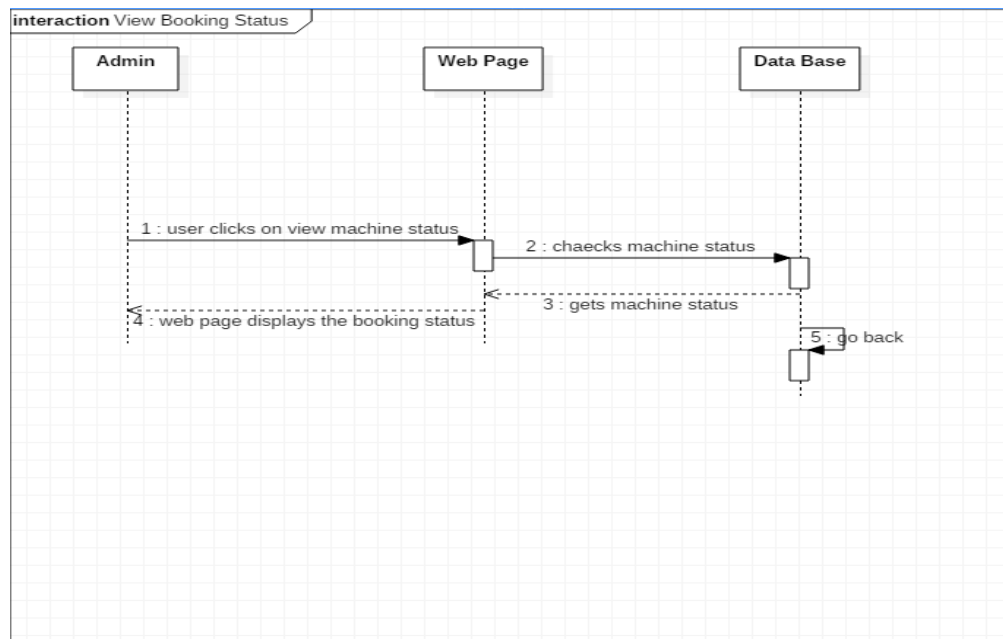
4.10 Sequence Diagram for Update Machinery Use Case



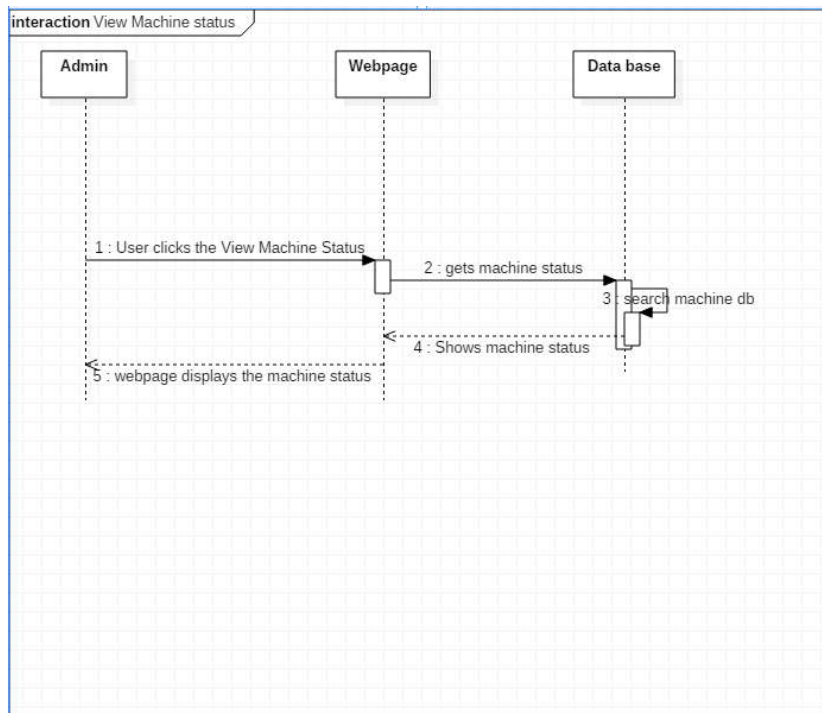
4.11 Sequence Diagram for Remove Machinery Use Case



4.12 Sequence Diagram for View Booking Status Use Case

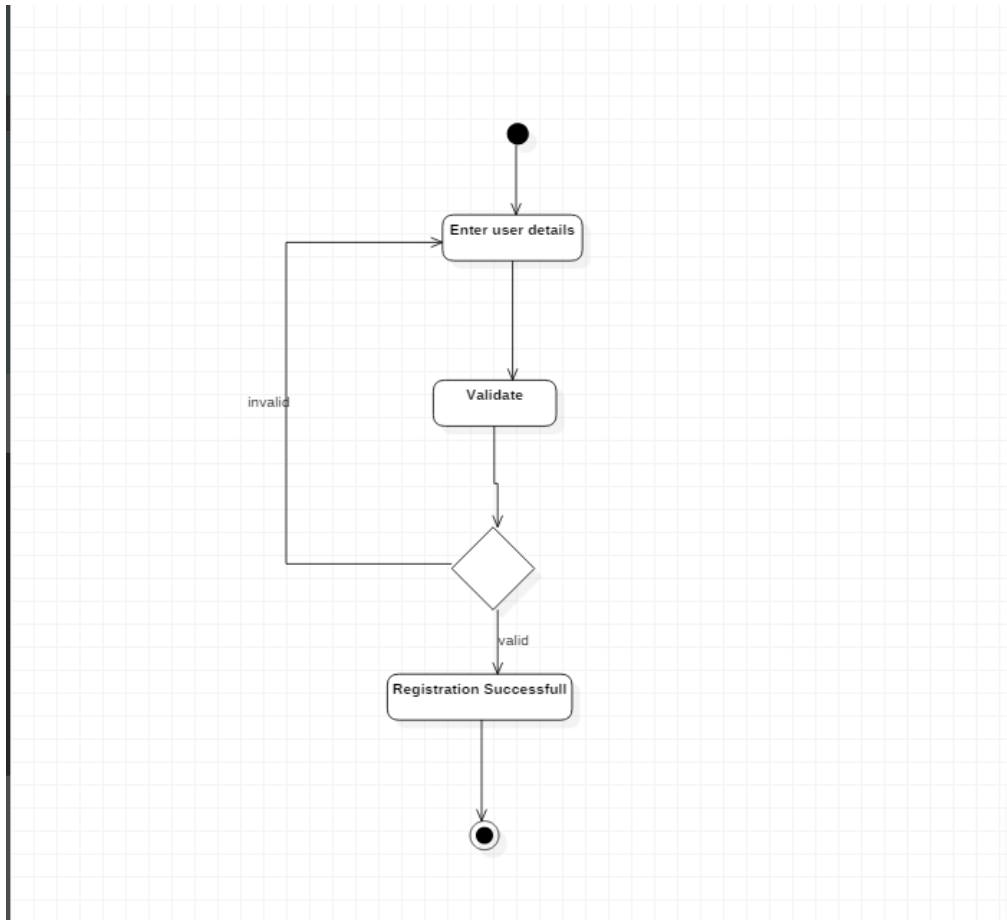


4.13 Sequence Diagram for View Machine status Use Case

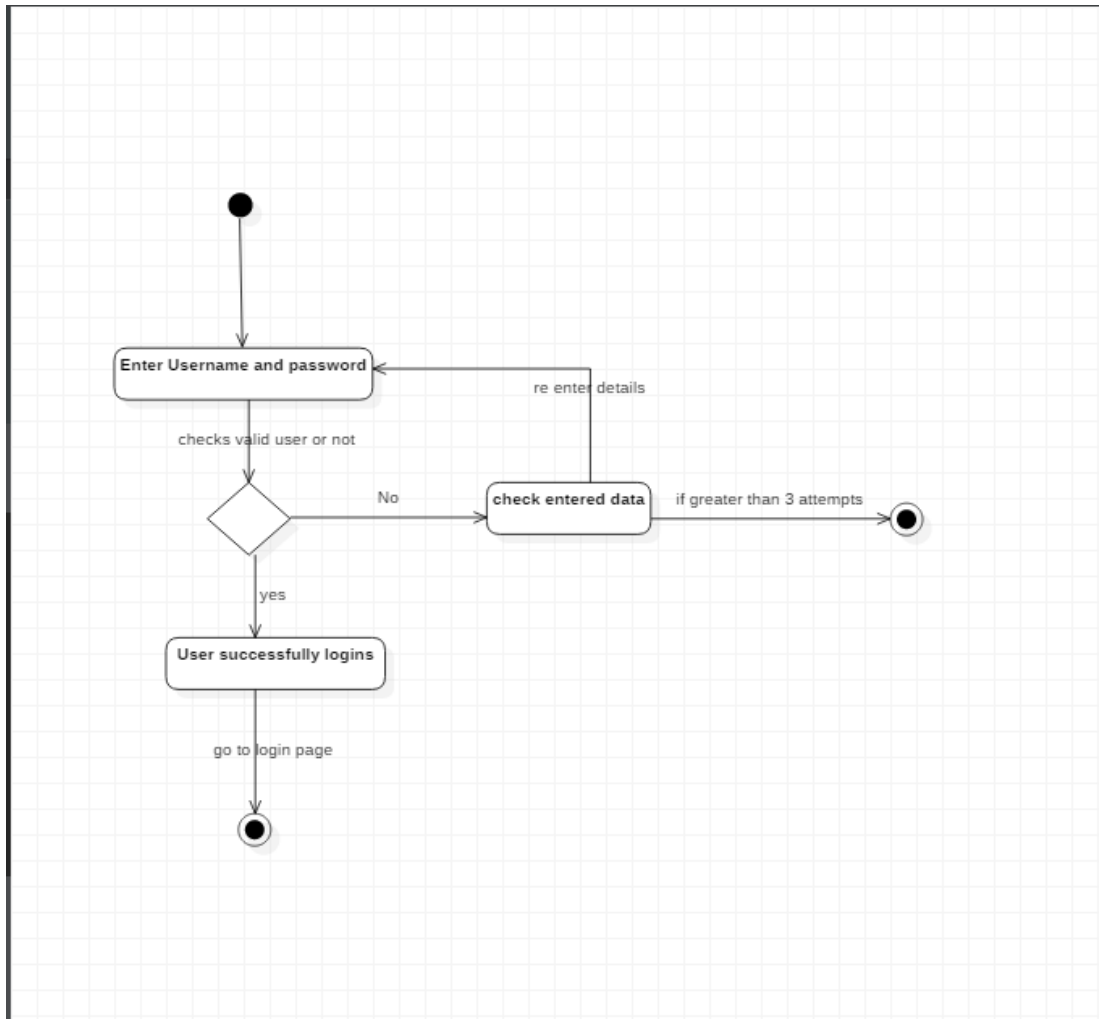


Section 5. Activity Diagram

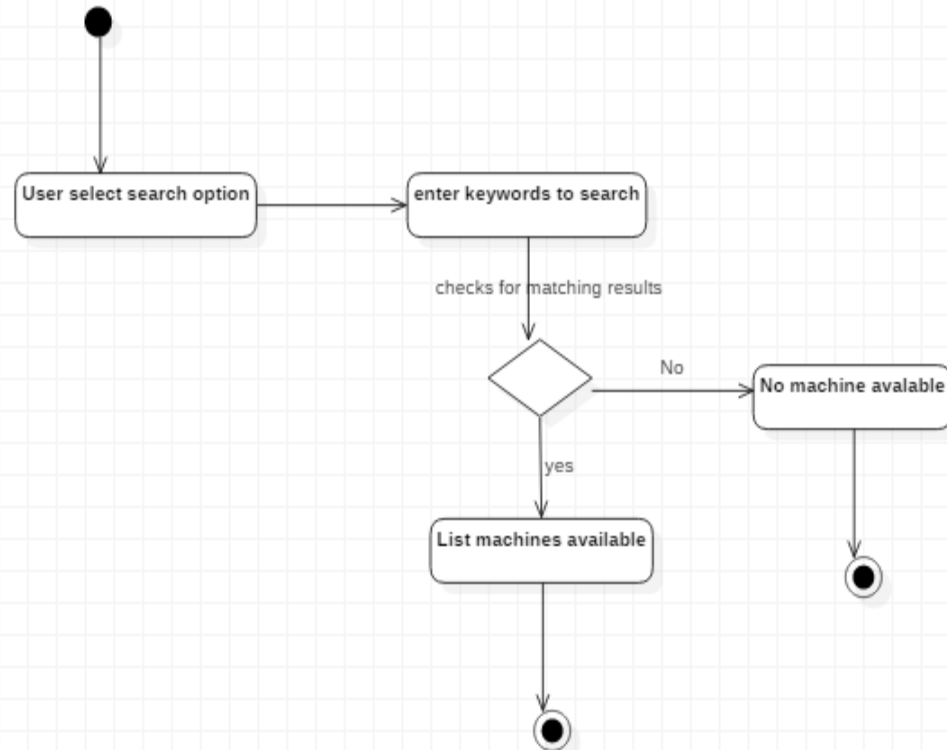
5.1 Activity Diagram for User Registration



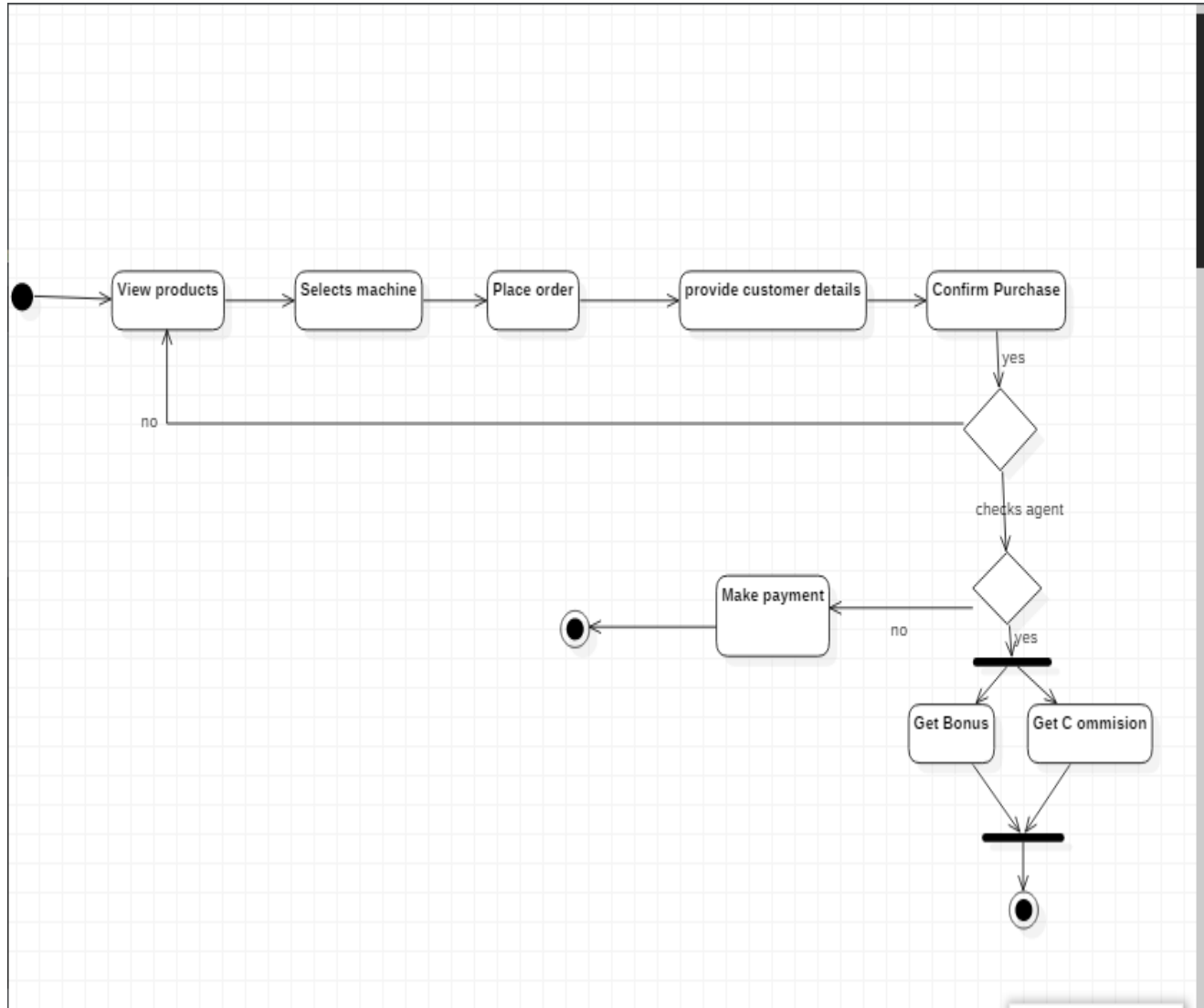
5.2 Activity Diagram for User Login Use Case



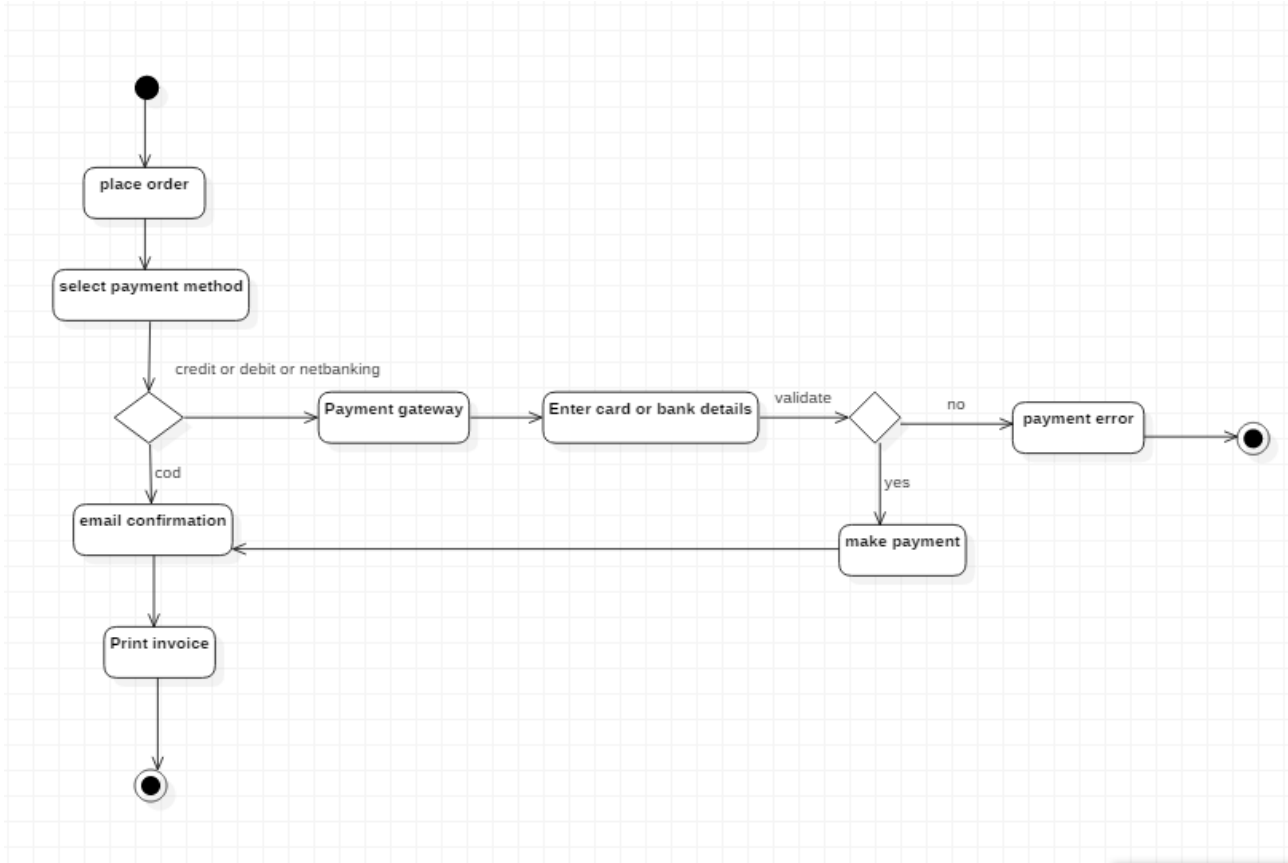
5.3 Activity Diagram for Machinery Search



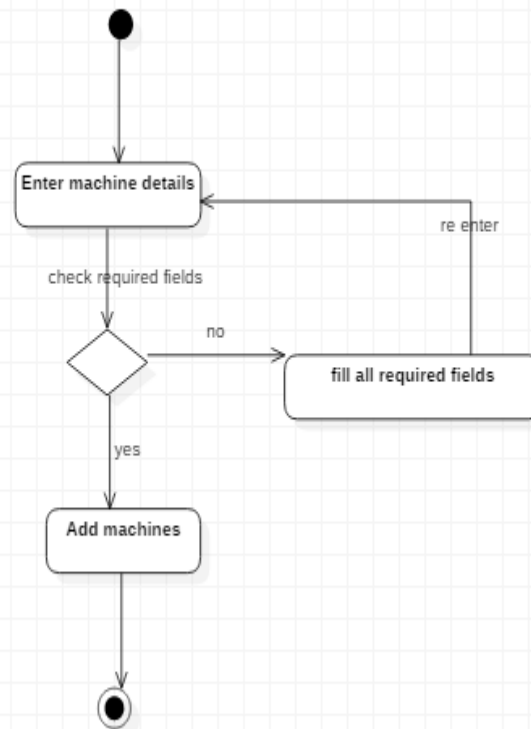
5.4 Activity Diagram for Place Order Use Case



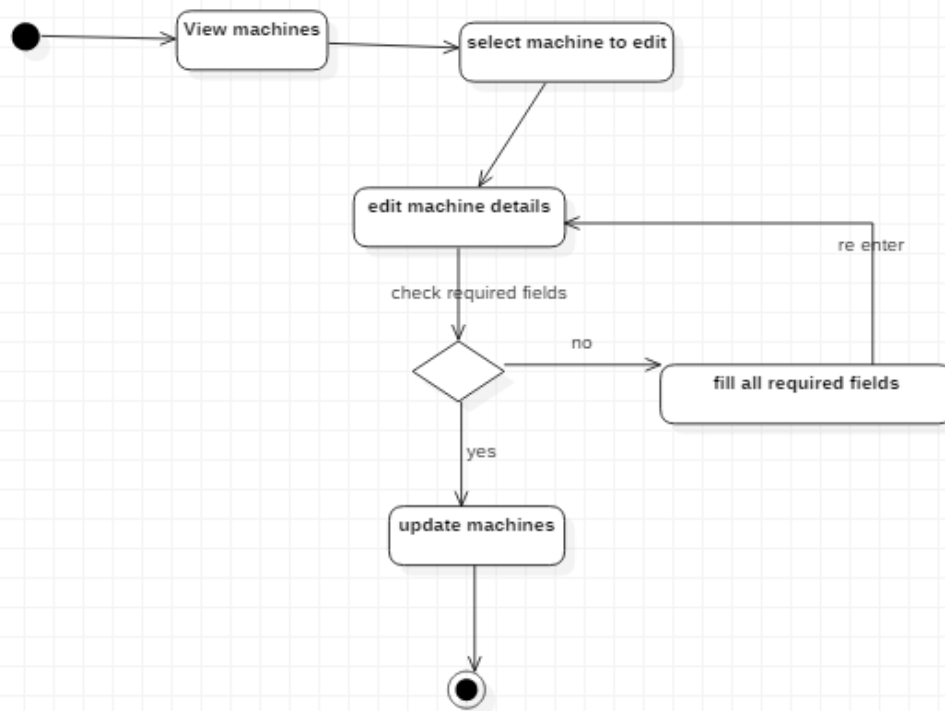
5.5 Activity Diagram for Make Payment



5.6 Activity Diagram for Add Machinery Use Case

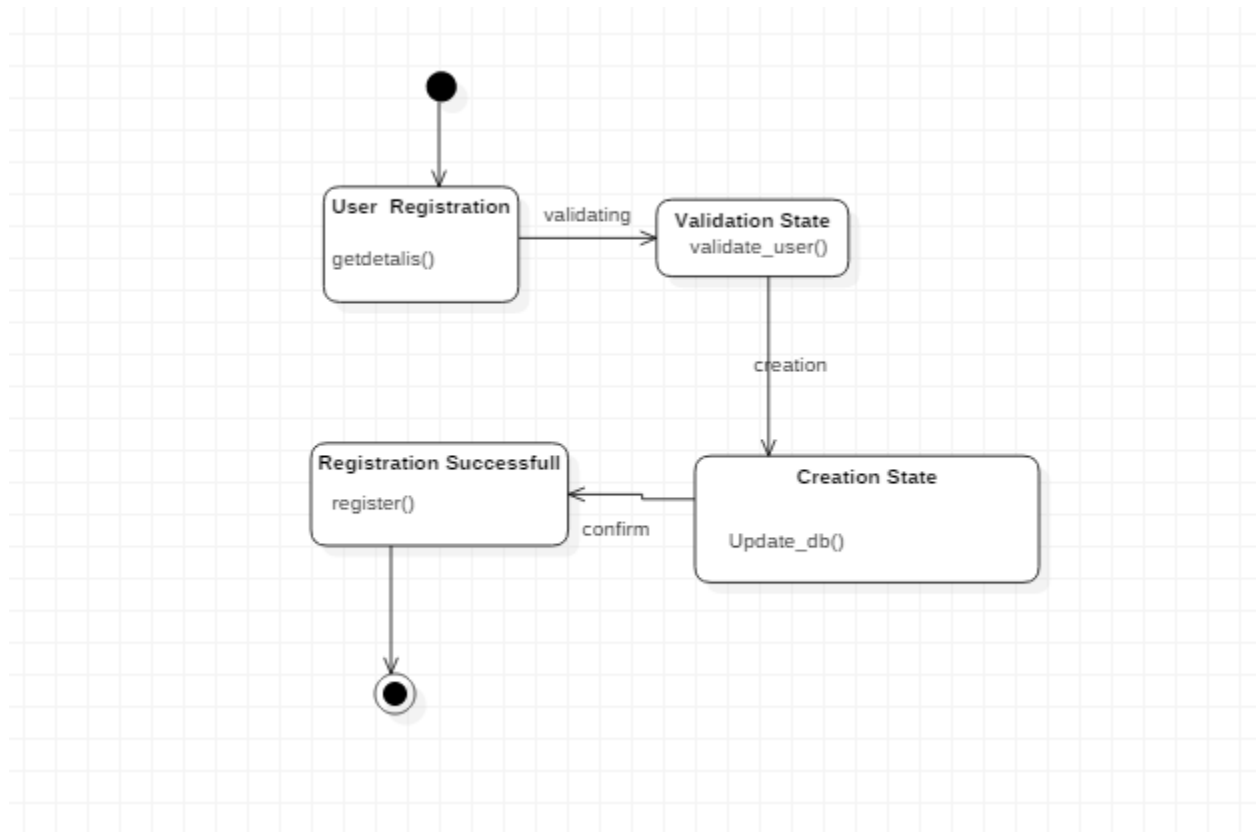


5.7 Activity Diagram for Update Machinery

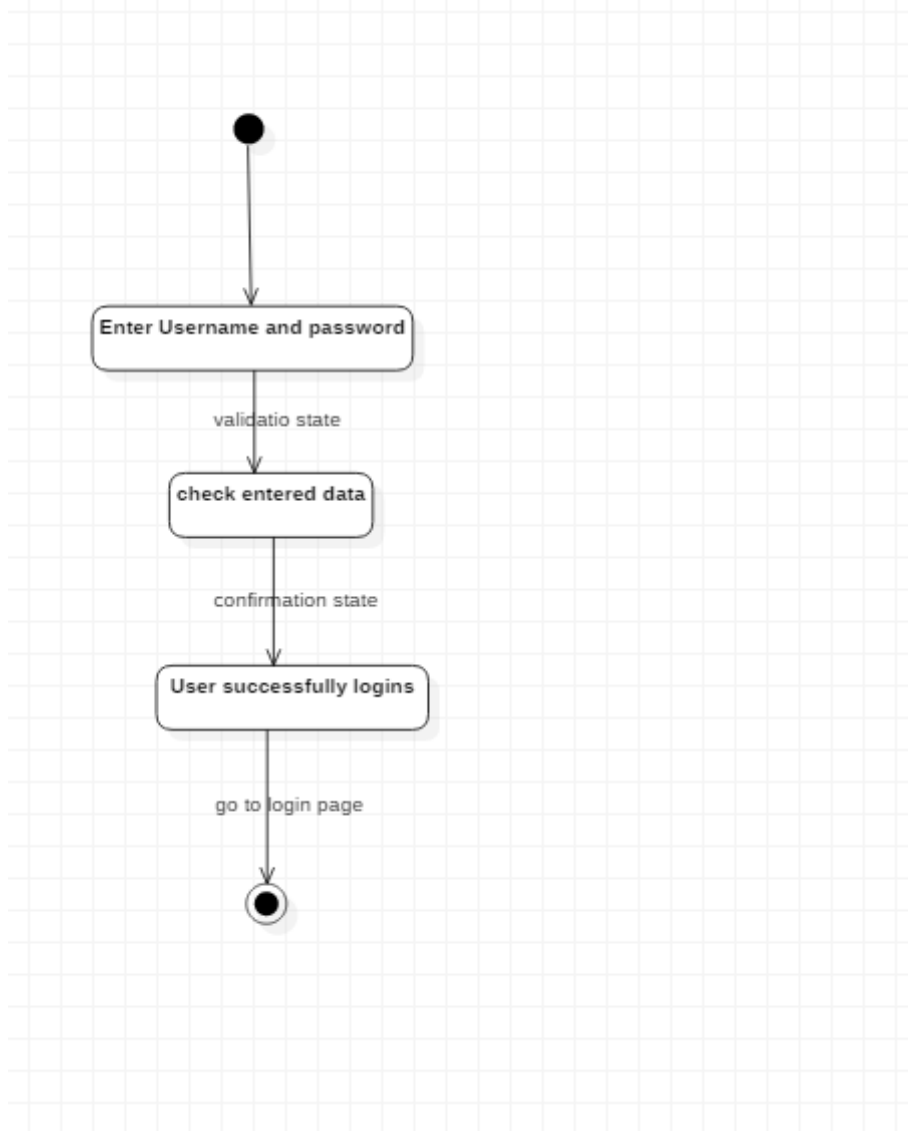


Section 6. State Chart Diagram

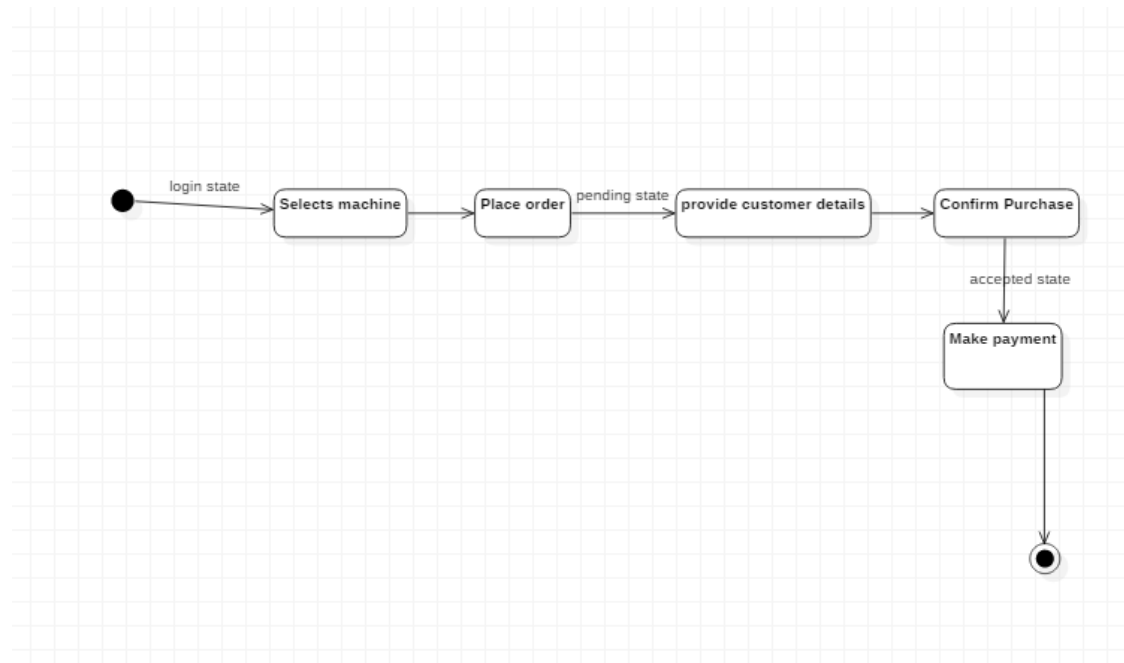
6.1 State Chart Diagram to depict state transitions of the user Object



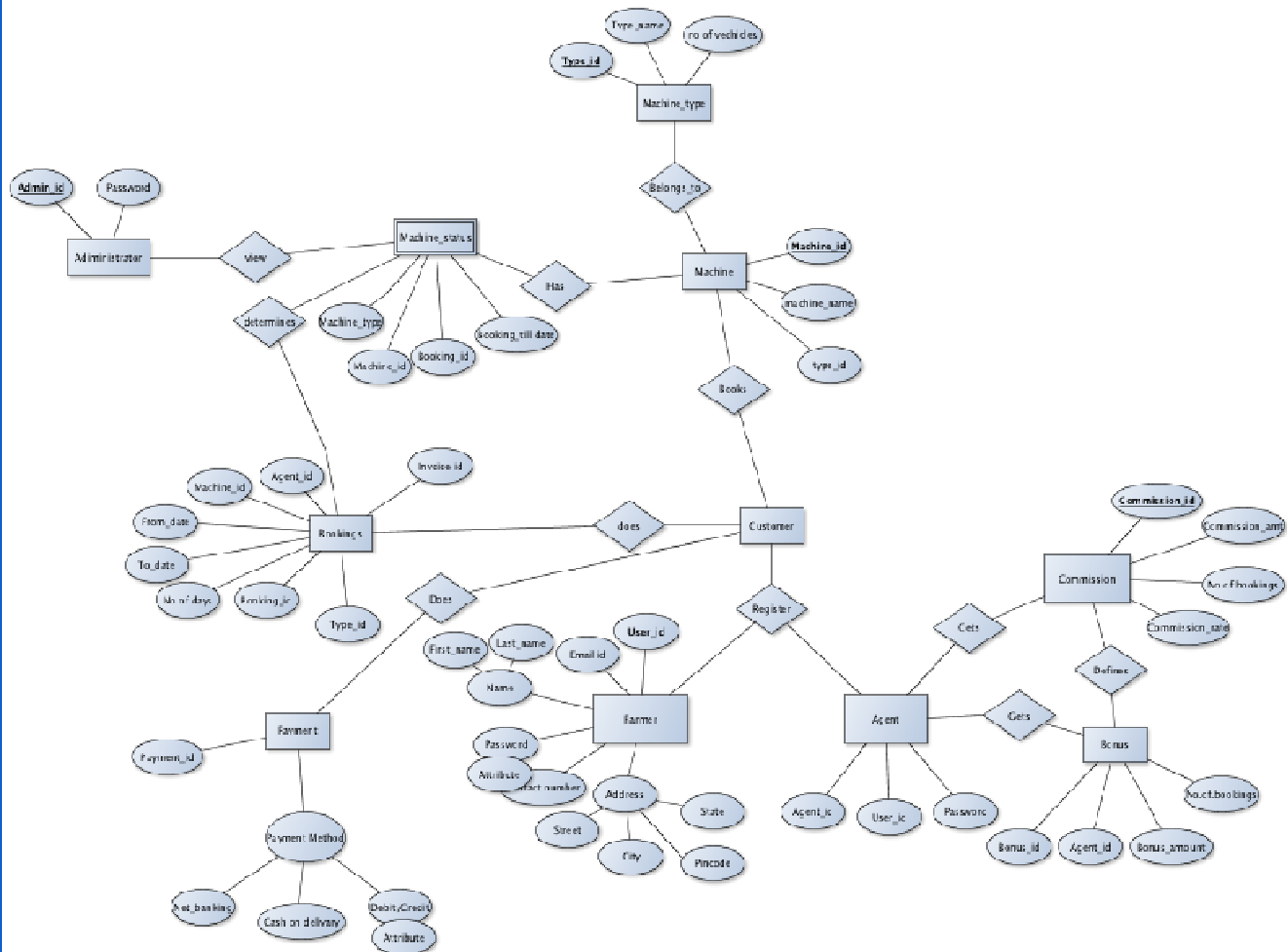
6.2 State Chart Diagram to depict state transitions of the login Object



6.3 State Chart Diagram to depict state transitions of the placeorder Object



7.1 ER Diagram



7.2 Table layout

7.2.1. Customer Table Layout

Attribute	Type
User id	Number,Primarykey
Name	Varchar
Email_id	Varchar
Password	Number
Address	Varchar
Contact number	number
Adhaar number	Number

7.2.2. Machine Table Layout

Attribute	Type
Machine_Id	Number, PrimaryKey
Machine_name	Varchar
Type_id	Number,foreign key referencing machine type table

7.2.3 Machine Type Table Layout

Attribute	Type
Type_Id	Number, PrimaryKey
Type_name	Varchar
No of machines	Number

7.2.4. Order Table Layout

Attribute	Type
Agent_id	Number
Machine_id	Number
From_date	Date
To_date	Date
No.of.days	Number
Booking_id	Number
Amount	Number
Invoice_id	Number

7.2.5 Admin Table Layout

Attribute	Type
Admin_Id	Number, PrimaryKey
Password	Varchar

7.2.6. Payment Table Layout

Attribute	Type
Payment_id	Number,Primarykey
Payment Method	Varchar

7.2.7. Commision Table Layout

Attribute	Type
Commision_Id	Number, PrimaryKey
Commision amout	Number

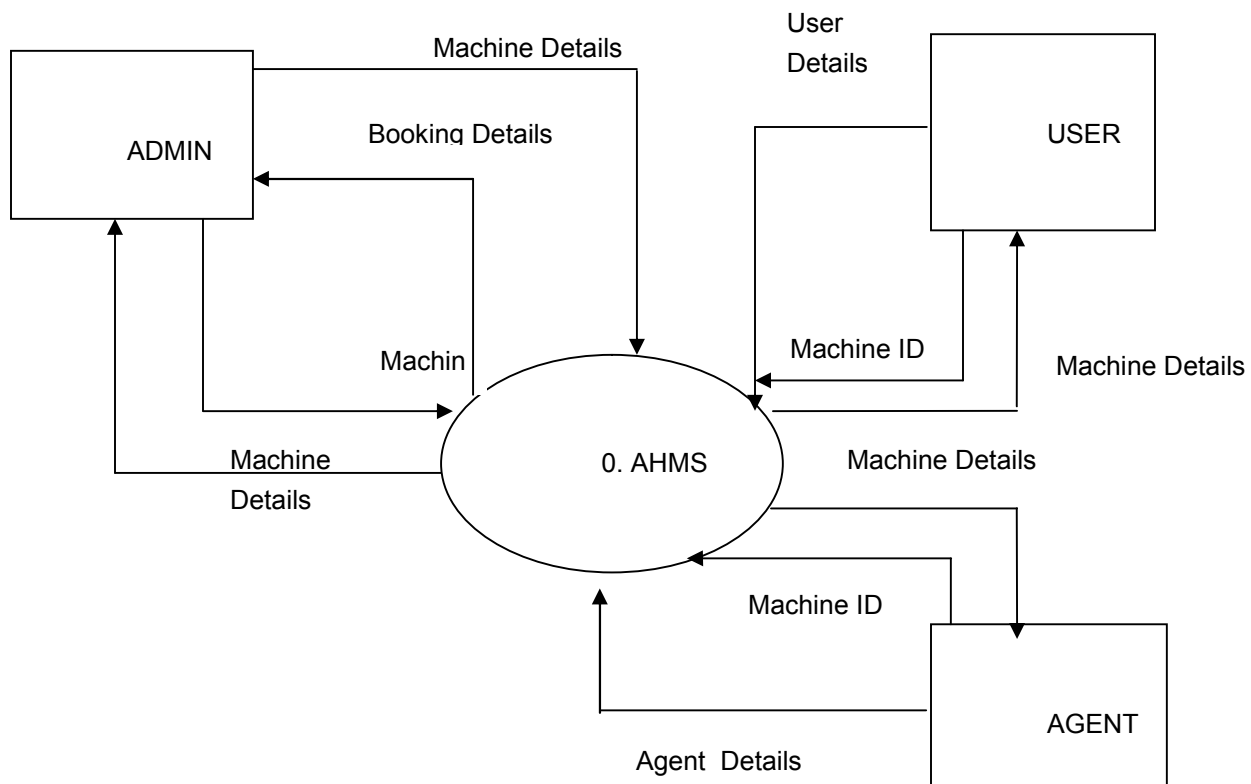
Agent id	Number,foreign key
Number of bookings	Number

7.2.8. Bonus Table Layout

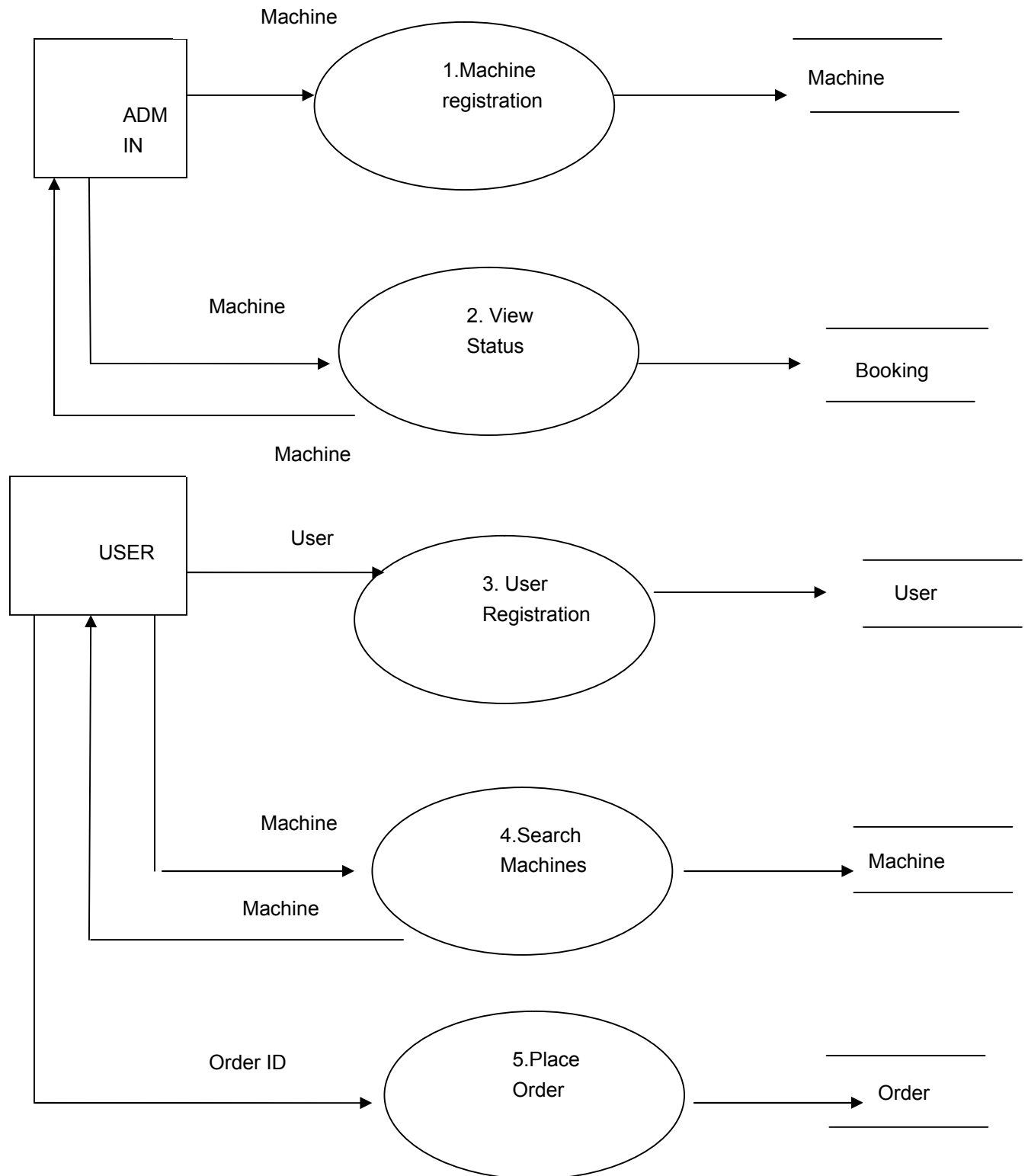
Attribute	Type
Bonus _Id	Number, PrimaryKey
Bonus amout	Number
Agent id	Number,foreign key
Number of bookings	Number

Section 8. Data Flow Diagrams

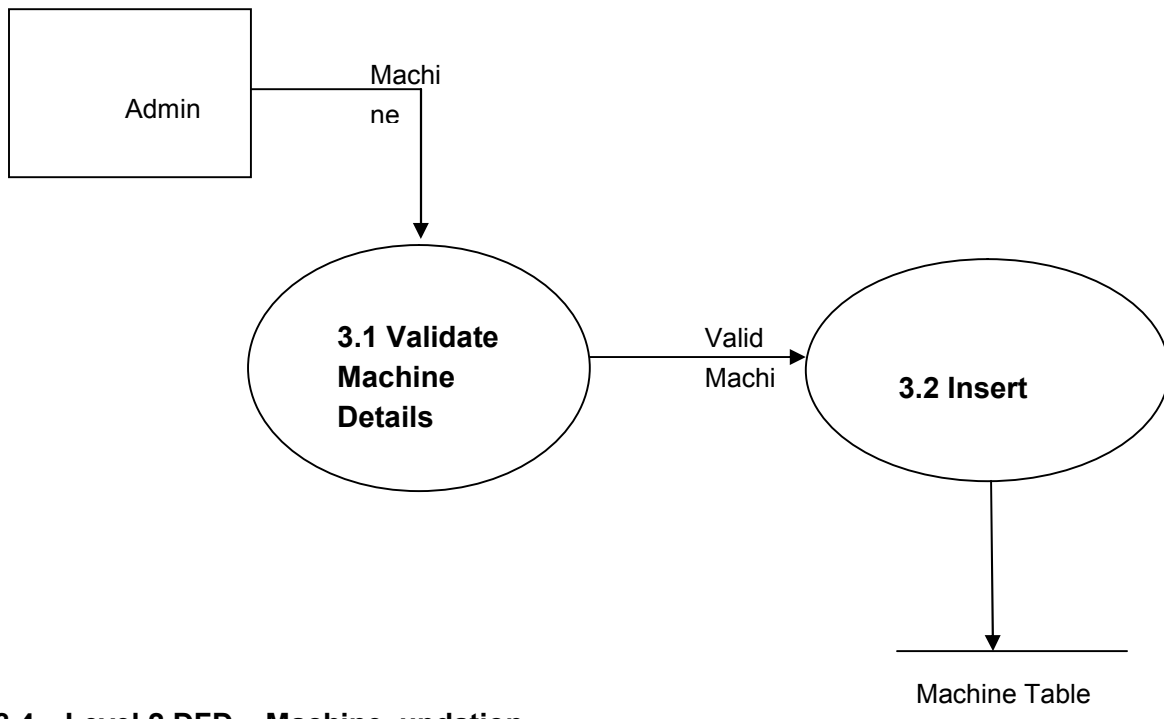
8.1 Level 0 DFD



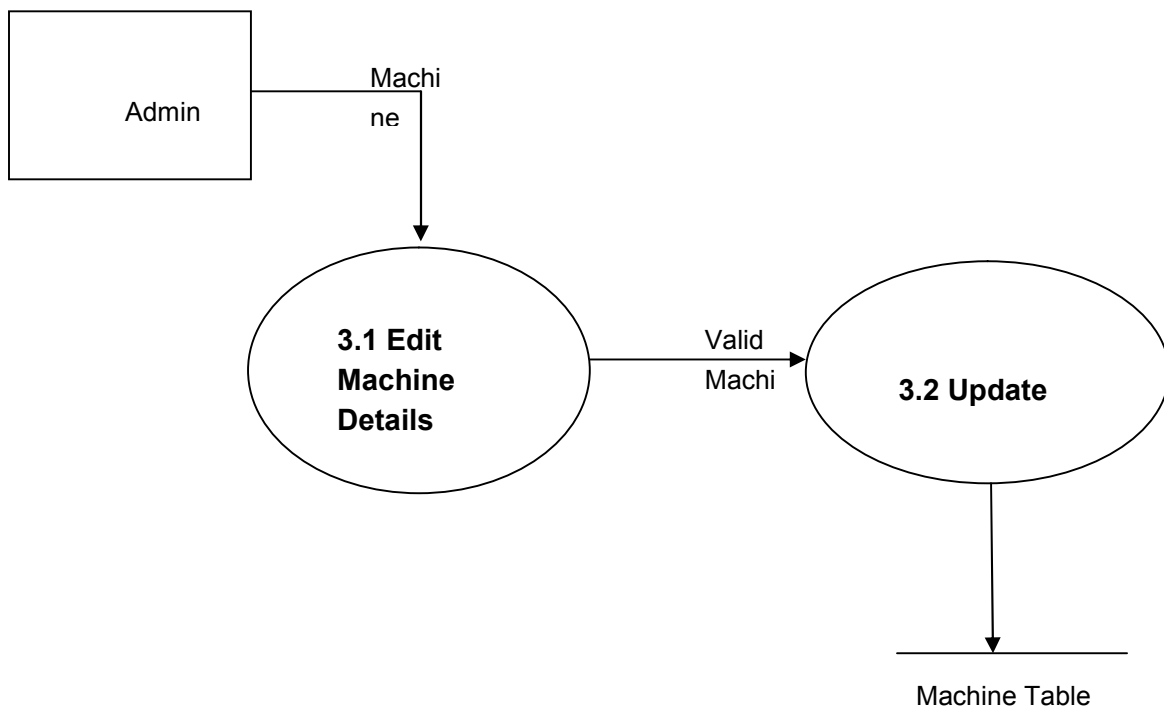
8.2 Level 1 DFD



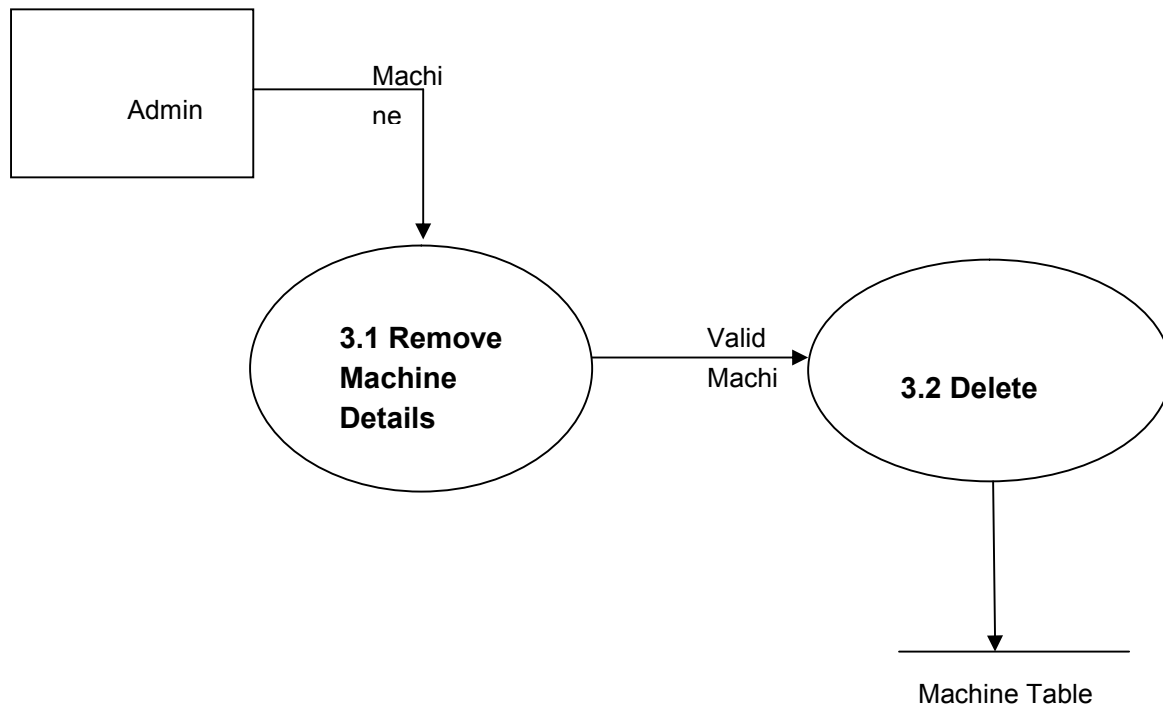
8.3 Level 2 DFD – Machine Registration



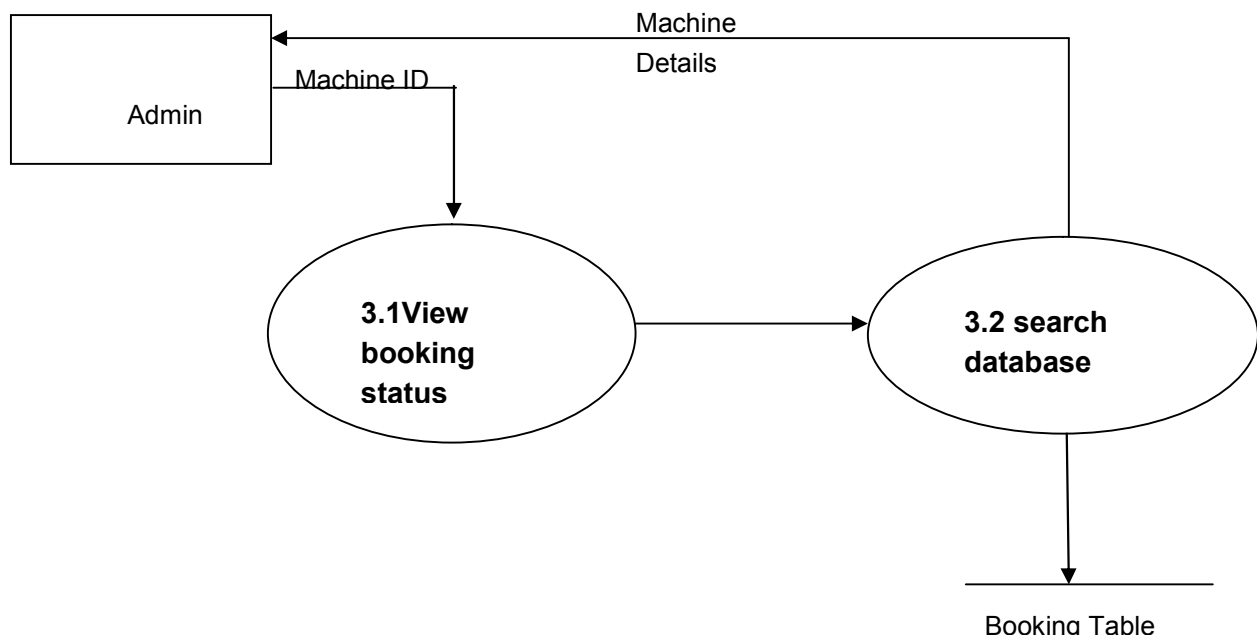
8.4 Level 2 DFD – Machine updation



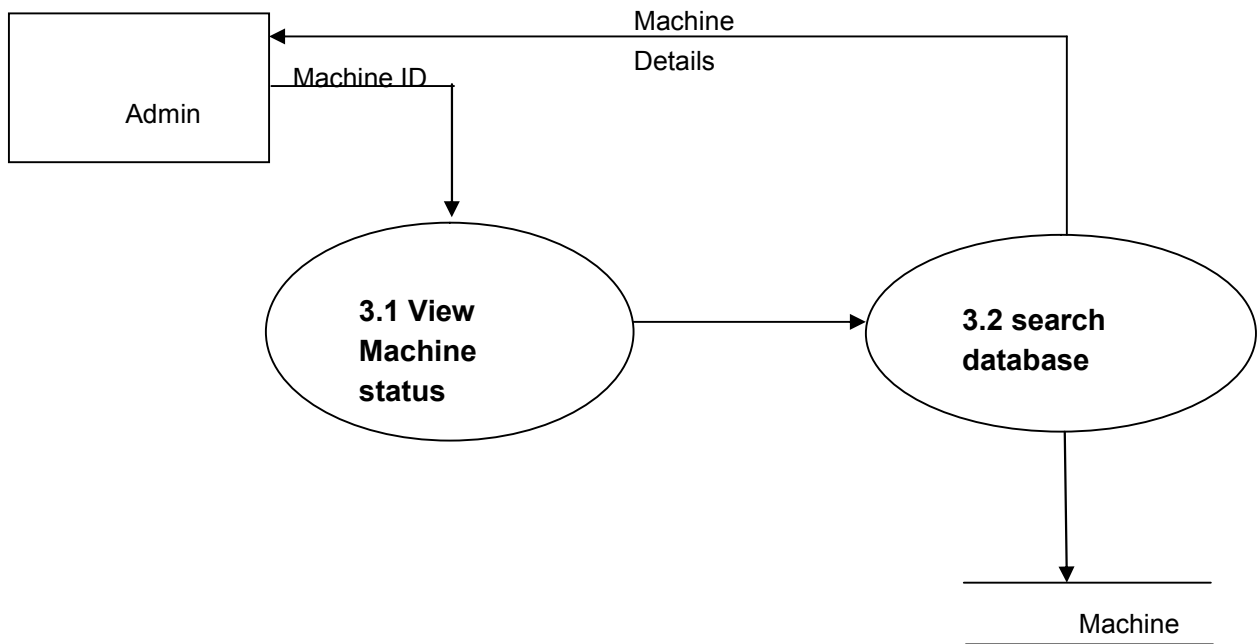
8.5 Level 2 DFD – Machine removal



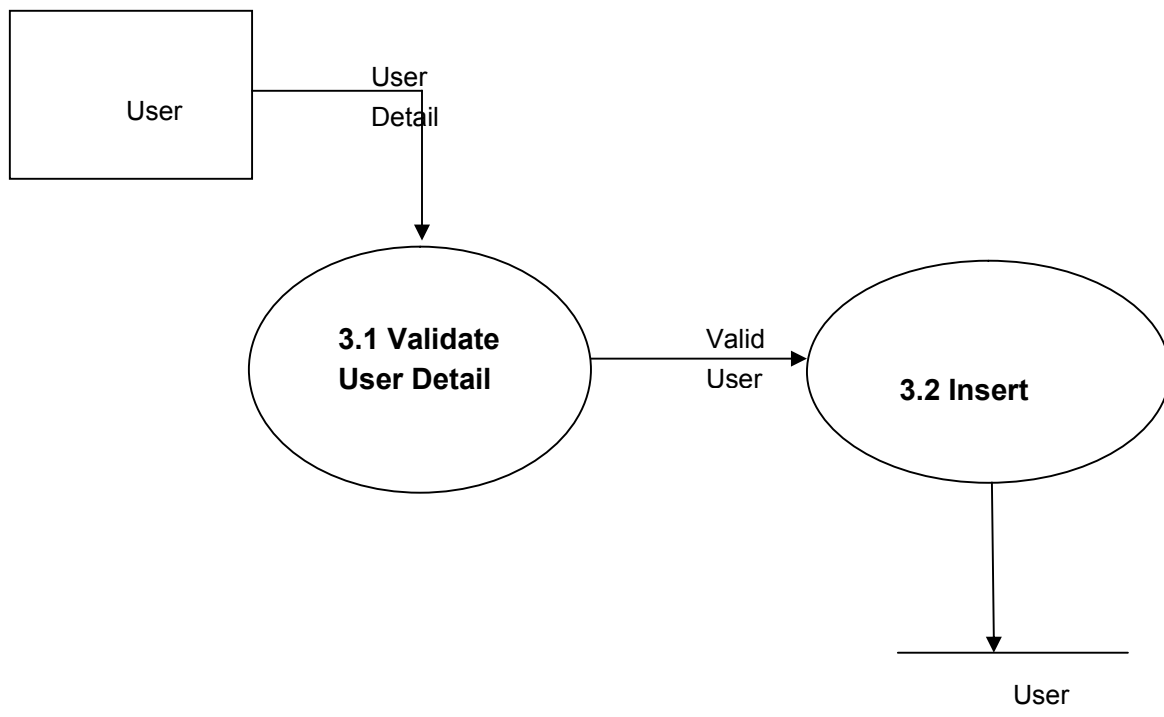
8.6 Level 2 DFD – View booking Status



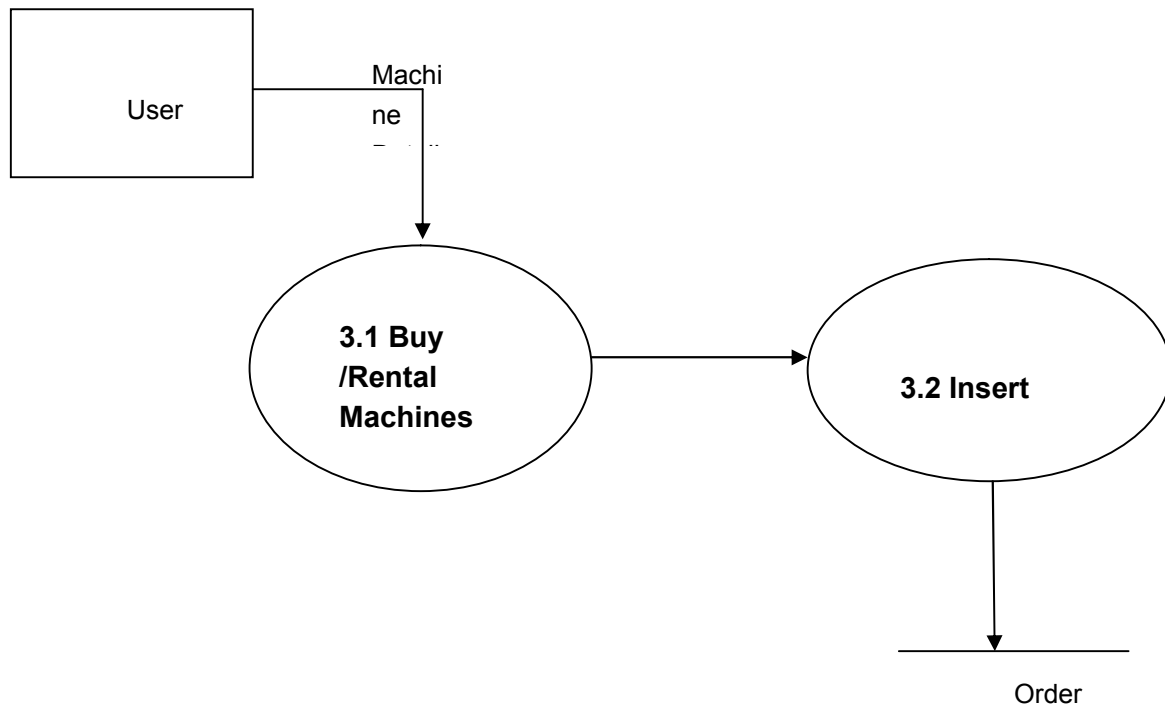
8.7 Level 2 DFD – View machine Status



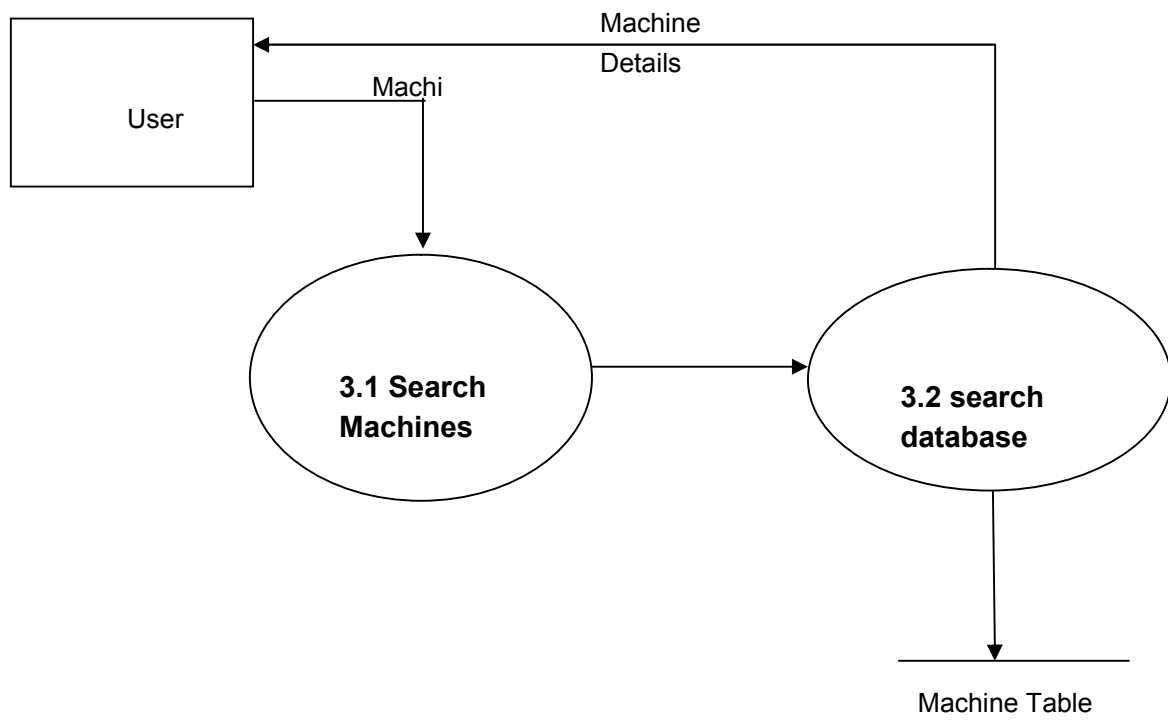
8.8 Level 2 DFD – User Registration



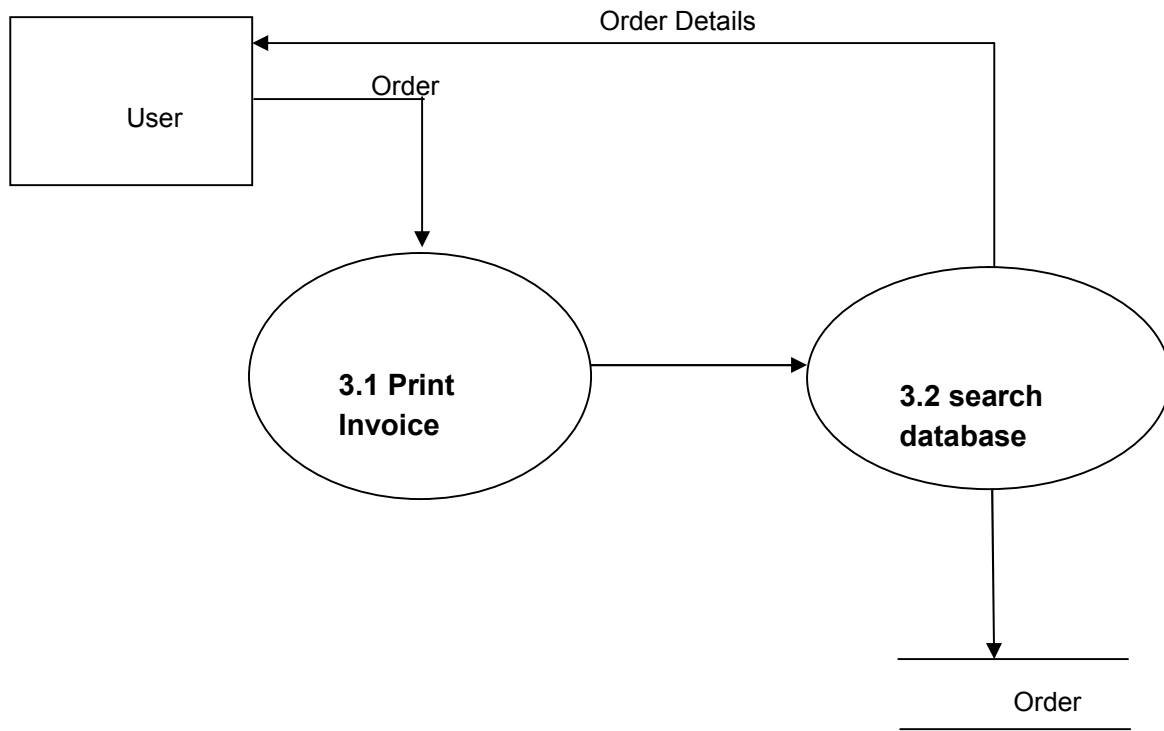
8.9 Level 2 DFD – Place order



8.10 Level 2 DFD – search machines



8.11 Level 2 DFD – Print invoice



Section 9. Detailed Module Description

9.1 User module

9.1.1. Module Description

User Module supports the following functions

User_registration

User_login

Search_machines

Check_availability

Place_order

Make_online_payment

Email_confirmation

Print_invoice

Gets_commission

Gets_bonus

Validate_data

Update_user

9.1.2. Function Description

9.1.2.1. Function Name – User_registration

9.1.2.1.1- Input Parameters – Character – name, username, password, address, contactno, adhaar number

9.1.2.1.2- Output Parameters – Not available

9.1.2.1.3. Called by Functions – Nil

9.1.2.1.4. Calling Functions – Nil

9.1.2.1.5 Process

GET input data

```
CALL Validate_data(username,password)

IF valid returned

    CALL Update_user

    IF UPDATE successful

        DISPLAY User registered Successfully

    ELSE

        DISPLAY User Not Registered Error Message

    END-IF

END-IF

END
```

9.1.2.2. Function Name – User_login

9.1.2.2.1- Input Parameters – Character – username, password

9.1.2.2.2- Output Parameters – Not available

9.1.2.2.3. Called by Functions – Nil

9.1.2.2.4. Calling Functions – Validate_user

9.1.2.2.5 Process

```
GET input data

CALL Validate_user (user_id)

IF valid returned

    User Successfully Logins

ELSE

    DISPLAY Invalid User Error Message

END-IF

END
```

9.1.2.3. Function Name – Search_machines

9.1.2.3.1- Input Parameters – Character machine type,machine name, machine_id

9.1.2.3.2- Output Parameters – Not available

9.1.2.3.3. Called by Functions – Nil

9.1.2.3.4. Calling Functions – search_db

9.1.2.3.5 Process

GET input data

CALL search_db (machine_id)

IF exists

DISPLAY List of Machines available

ELSE

DISPLAY No Machine available Message

END-IF

END

9.1.2.4. Function Name – Check_availability

9.1.2.4.1- Input Parameters – Character – machine_id

9.1.2.4.2- Output Parameters – Not available

9.1.2.4.3. Called by Functions – Nil

9.1.2.4.4. Calling Functions – search_db

9.1.2.4.5 Process

GET input data

CALL search_db (machine_id)

IF exists

DISPLAY Machines available message

ELSE

DISPLAY Machine not available Message

END-IF

END

9.1.2.5. Function Name – Place_order

9.1.2.5.1- Input Parameters – Character – machine_id, machine name,from_date, to_date,
amount

9.1.2.5.2- Output Parameters – Not available

9.1.2.5.3. Called by Functions – Nil

9.1.2.5.4. Calling Functions – make_payment, update_db

9.1.2.5.5 Process

GET input data

CALL make_payment (order_id)

IF valid payment

CALL update_db

IF UPDATE successful

DISPLAY Order Placed Successfully

ELSE

DISPLAY Order Not placed Error Message

END-IF

END

END-IF

END

9.1.2.6. Function Name – make online payment

9.1.2.6.1- Input Parameters – Character- user id, password, pay amount, payment type

9.1.2.6.2- Output Parameters – Not available

9.1.2.6.3. Called by Functions – Nil

9.1.2.6.4. Calling Functions make online payment, validate user

9.1.2.6.5 Process

GET input data

CALL validate user

IF valid returned

CALL make online payment

IF make online payment successful

DISPLAY online payment successfully

ELSE

DISPLAY online payment error message

END IF

END IF

END

9.1.2.7. Function Name – Recevie email confirmation

9.1.2.7.1- Input Parameters – Character- user : user id, password, payment, booking id

9.1.2.7.2- Output Parameters – Not available

9.1.2.7.3. Called by Functions – Nil

9.1.2.7.4. Calling Functions - validate user, generate email

9.1.2.1.5 Process

GET input data

CALL validate user (user id)

IF valid returned

CALL generate email

IF generate email successful

DISPLAY generate email successfully

ELSE

DISPLAY generate email error message

END IF

END IF

END

9.1.2.8. Function Name – print invoice

9.1.2.8.1- Input Parameters – Character- order_id

9.1.2.8.2- Output Parameters – Not available

9.1.2.8.3. Called by Functions – Nil

9.1.2.8.4. Calling Functions - validate, print in voice

9.1.2.8.5 Process

GET input data

CALL validate user (user id)

IF valid returned

CALL print invoice

IF print invoice successful

DISPLAY print invoice successfully

ELSE

DISPLAY print invoice error message

END IF

END IF

END

9.1.2.9. Function Name – : get commission

9.1.2.9.1- Input Parameters – Character- order_id,agent_id

9.1.2.9.2- Output Parameters – Not available

9.1.2.9.3. Called by Functions – Nil

9.1.2.9.4. Calling Functions – validate, gets commission

9.1.2.9.5 Process

GET input data

CALL validate user (agent id)

IF valid returned

CALL Gets commissions

IF gets commission successful

DISPLAY gets commission successfully

ELSE

DISPLAY gets commission error message

END IF

END IF

END

9.1.2.10. Function Name – : : get bonus

9.1.2.10.1- Input Parameters – Character- order_id,agent_id

9.1.2.10.2- Output Parameters – Not available

9.1.2.10.3. Called by Functions – Nil

9.1.2.10.4. Calling Functions – validate, gets commission

9.1.2.10.5 Process

GET input data

CALL validate user (agent id)

IF valid returned

CALL Get bonus

IF get bonus successful

DISPLAY get bonus successfully

ELSE

```
                DISPLAY get bonus error message
            END IF
        END IF
    END
```

9.2 Admin module

9.2.1. Module Description (if object oriented development give class details and give pseudo code for member functions)

Admin Module supports the following functions

Add_machinery

Update_machinery

Remove_machinery

View_booking_status

View_machine_status

9.2.2.2. Function Name – Add Machinery

9.2.2.2.1- Input Parameters – Character – Machine Name, Machine type, Machine cost.

9.2.2.2.2- Output Parameters – Not available

9.2.2.2.3. Called by Functions – Nil

9.2.2.2.4. Calling Functions – validate machinery, Update machine details

9.2.2.2.5 Process

GET input data

CALL Validate machine (machine id)

If valid returned

CALL update machine details

If Update Successful

DISPLAY Machine added successfully

ELSE

DISPLAY Machine Added Error

END_IF

END

9.2.2.3. Function Name – up date machine

9.2.2.3.1- Input Parameters – Character – Machine Name, Machine type, Machine cost.

9.2.2.3.2- Output Parameters – Not available

9.2.2.3.3. Called by Functions – Nil

9.2.2.3.4. Calling Functions – validate machinery, Update machine details

9.2.2.3.5 Process

GET input data

CALL Validate machine (machine id)

If valid returned

CALL update machine details

If Update Successful

DISPLAY Machine updated successfully

ELSE

DISPLAY Machine updated Error

END_IF

END

9.2.2.4. Function Name – remove machinery

9.2.2.4.1- Input Parameters – Character – Machine id

9.2.2.4.2- Output Parameters – Not available

9.2.2.4.3. Called by Functions – Nil

9.2.2.4.4. Calling Functions – validate machinery, delete

9.2.2.4.5 Process

GET input data

CALL Validate machine (machine id)

If valid returned

CALL delete details

If delete Successful

DISPLAY Machine deleted successfully

ELSE

DISPLAY Machine delete Error

END_IF

END

9.2.2.5. Function Name – : view booking status

9.2.2.5.1- Input Parameters – Character – Machine id

9.2.2.5.2- Output Parameters – Not available

9.2.2.5.3. Called by Functions – Nil

9.2.2.5.4. Calling Functions – validate machinery, search db

9.2.2.5.5 Process

GET input data

CALL Validate machine (machine id)

If valid returned

CALL search db

If search Successful

DISPLAY list of bookings made

ELSE

DISPLAY No bookings

END_IF

END

9.2.2.6. Function Name – : view machine status

9.2.2.6.1- Input Parameters – Character – Machine id

9.2.2.6.2- Output Parameters – Not available

9.2.2.6.3. Called by Functions – Nil

9.2.2.6.4. Calling Functions – validate machinery, search db

9.2.2.6.5 Process

GET input data

CALL Validate machine (machine id)

If valid returned

CALL search db

If search Successful

DISPLAY list of machine available

ELSE

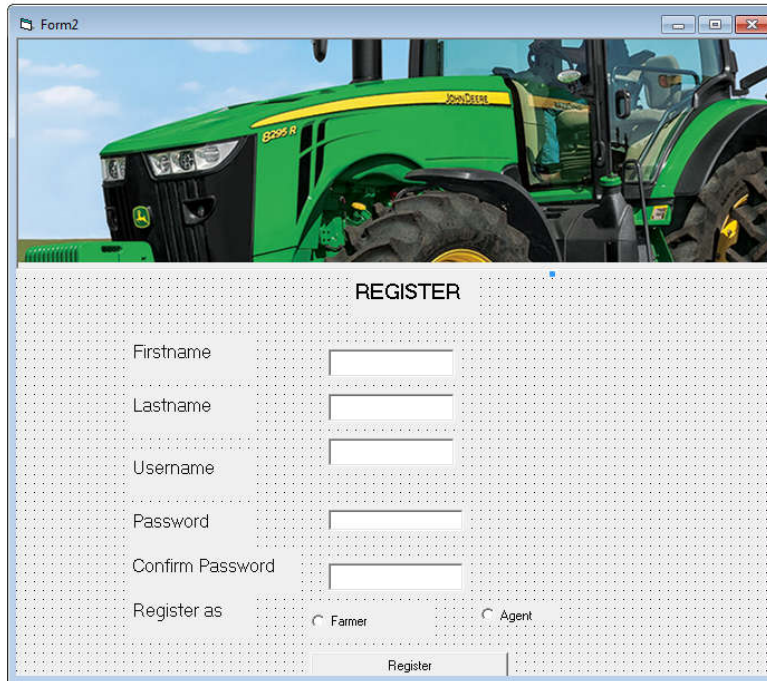
DISPLAY No machines

END_IF

END

Section 10. User Interface Design

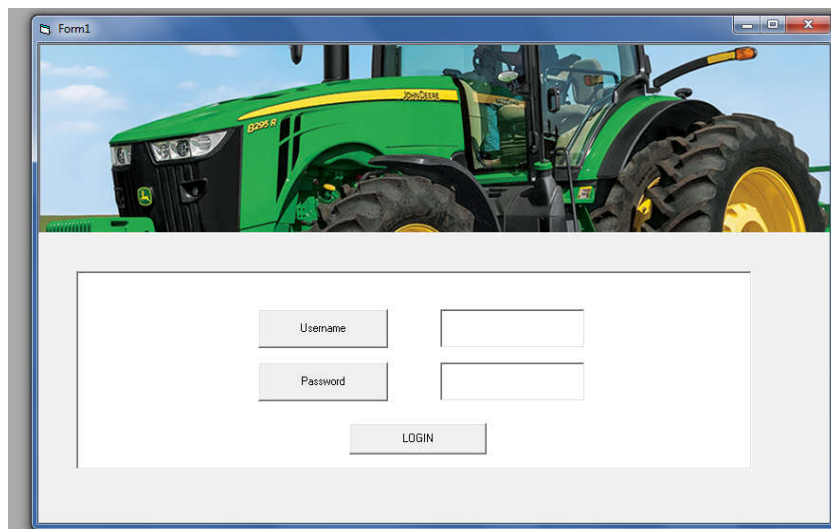
10.1 User Interface Screen for User Registration



The screenshot shows a window titled "Form2" with a background image of a green John Deere tractor. The window contains a registration form with the following fields and controls:

- REGISTER** (Section Header)
- Firstname:
- Lastname:
- Username:
- Password:
- Confirm Password:
- Register as: ☐ Farmer ☐ Agent
- Register** (Button)

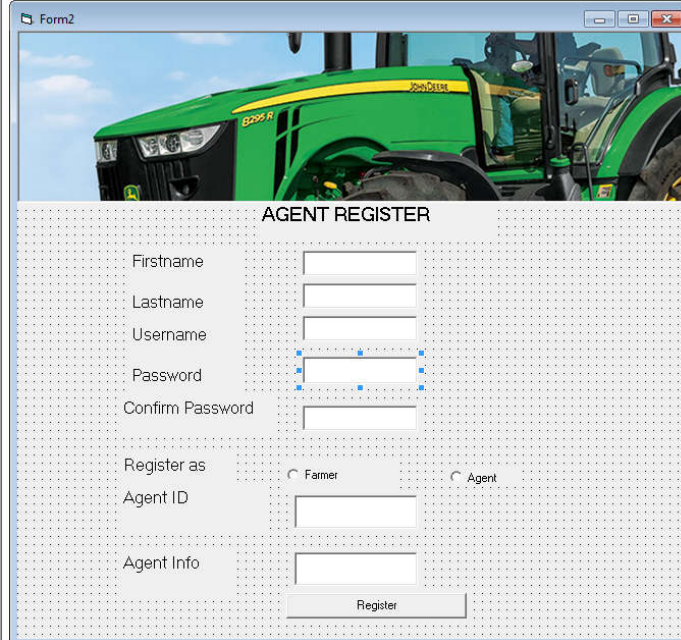
10.2 User Interface Screen for User Login



The screenshot shows a window titled "Form1" with a background image of a green John Deere tractor. The window contains a login form with the following fields and controls:

- Username:
- Password:
- LOGIN** (Button)

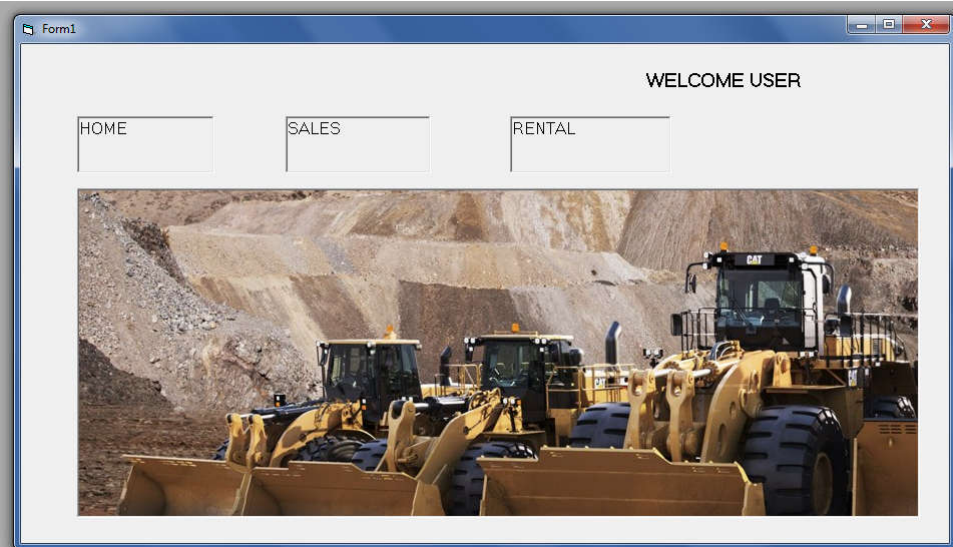
10.3 User Interface Screen for Agent Register



The screenshot shows a software window titled "Form2" with a background image of a green John Deere tractor. The window contains a registration form titled "AGENT REGISTER". The form includes the following fields and controls:

- Firstname: Text input field
- Lastname: Text input field
- Username: Text input field
- Password: Text input field with a strength indicator (blue dots)
- Confirm Password: Text input field
- Register as: Radio buttons for "Farmer" and "Agent"
- Agent ID: Text input field
- Agent Info: Text input field
- Register: Submit button

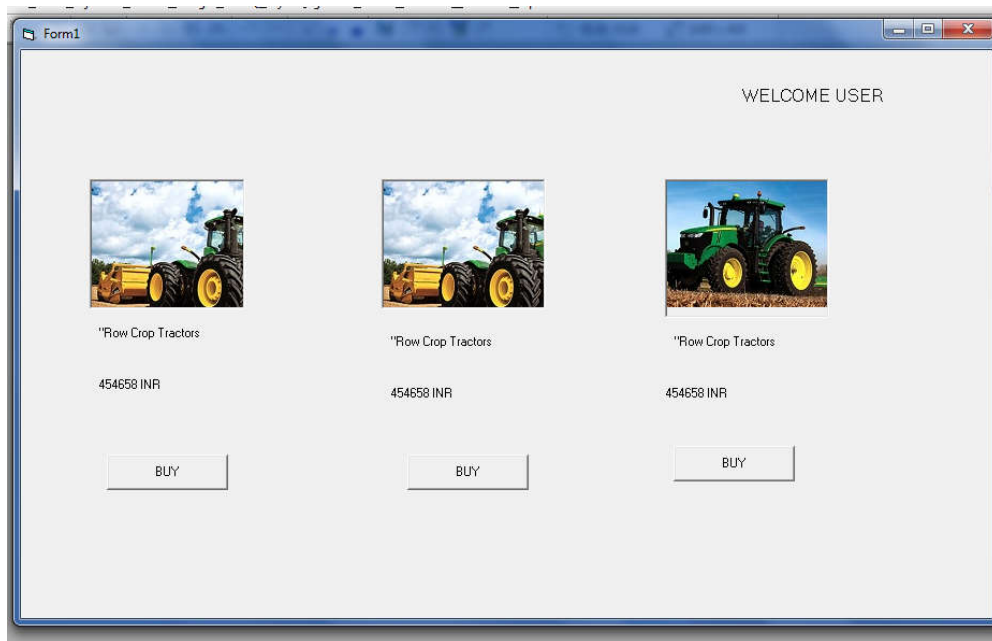
10.4 User Interface Screen for User Home Page



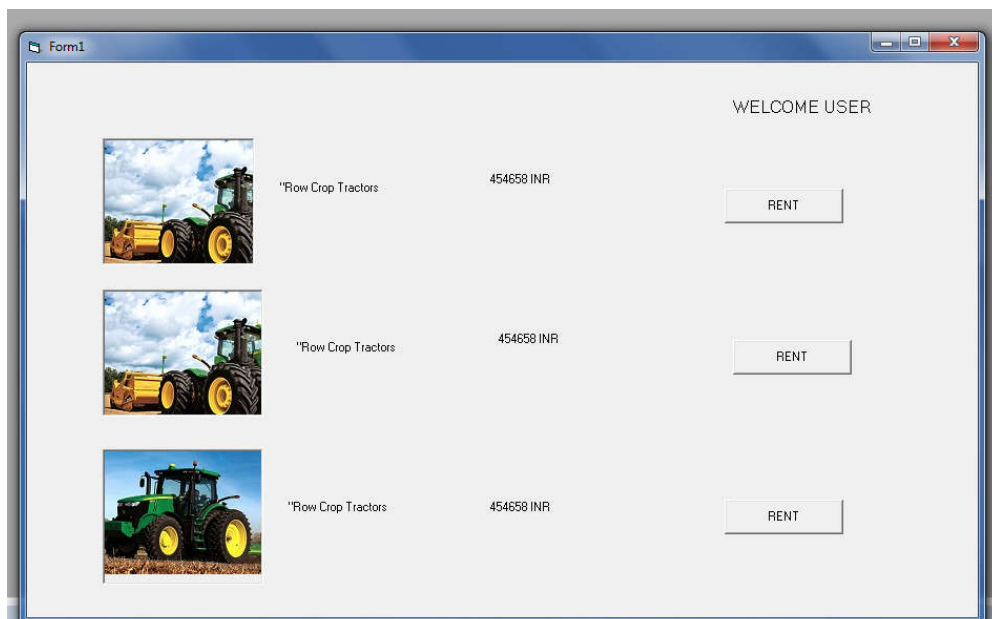
The screenshot shows a software window titled "Form1" with a background image of yellow CAT wheel loaders at a quarry. The window contains a home page titled "WELCOME USER". The page includes the following elements:

- Navigation buttons: "HOME", "SALES", and "RENTAL"
- Main image: A large photograph of yellow CAT wheel loaders in a quarry setting.

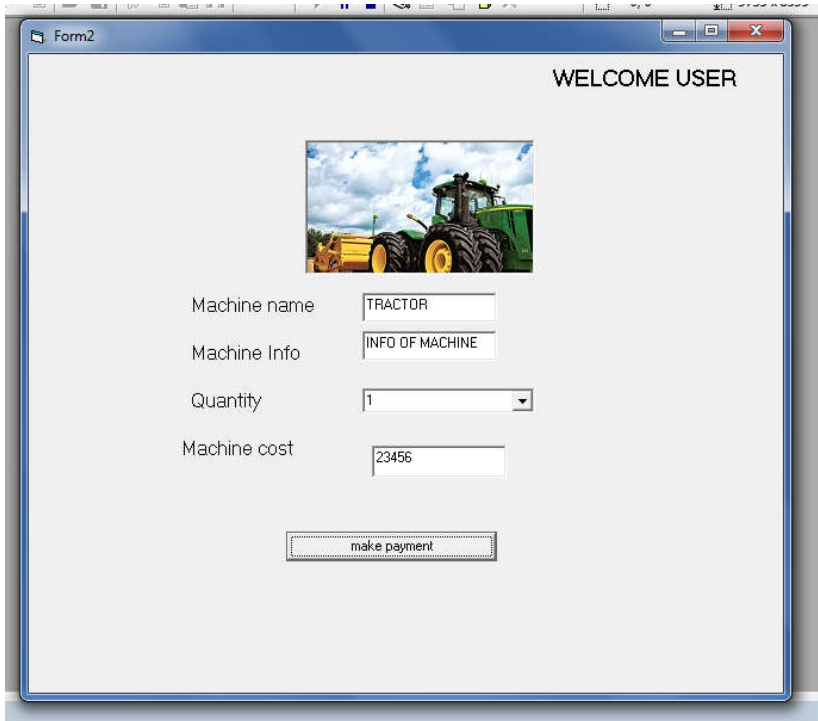
10.5 User Interface Screen for Buy Machines



10.6 User Interface Screen for Rent machinery




10.7 User Interface Screen for Place order



Form2

WELCOME USER



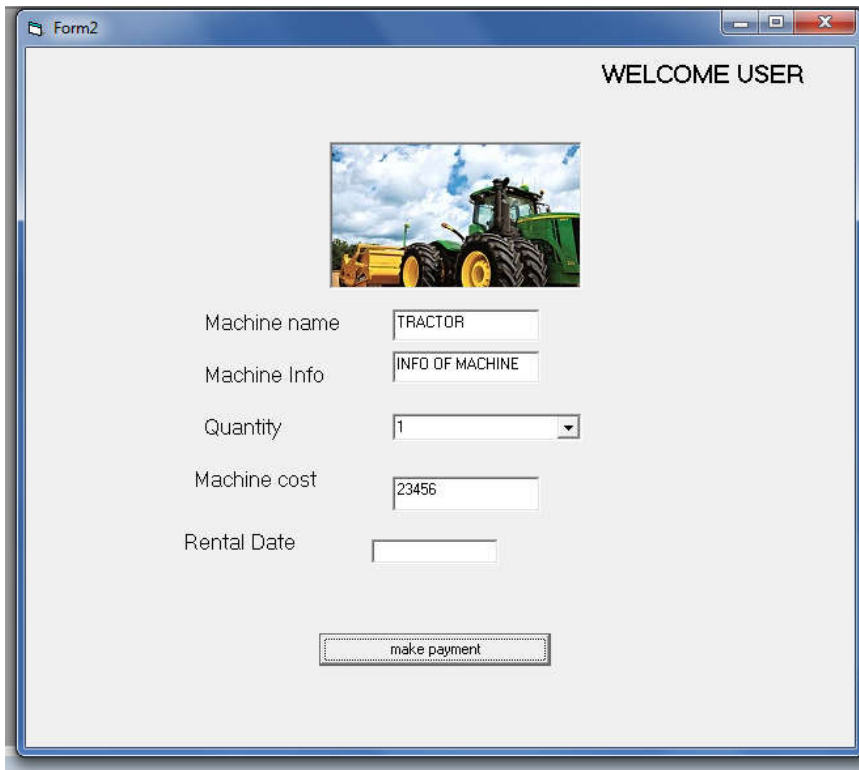
Machine name

Machine Info

Quantity


Machine cost

10.8 User Interface Screen for Rental order



Form2

WELCOME USER



Machine name

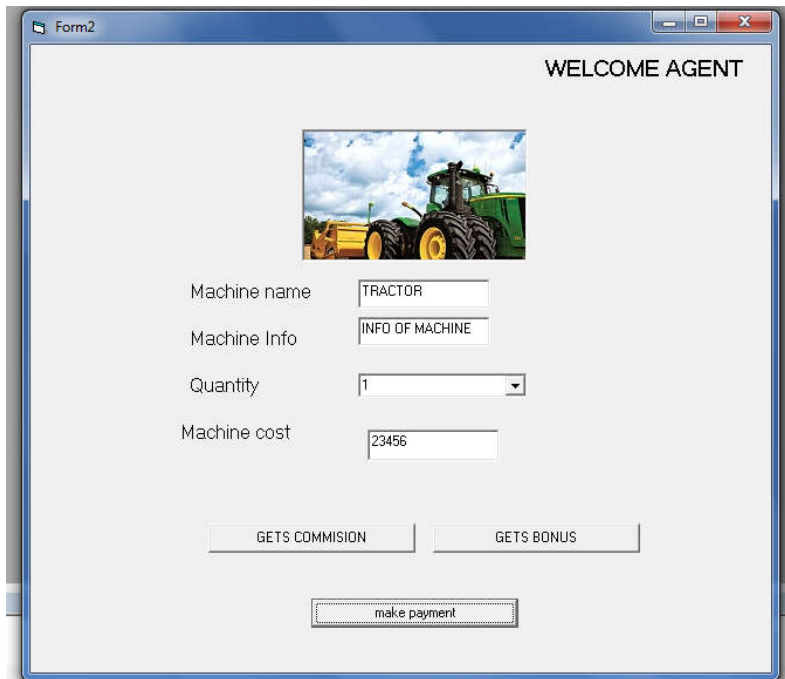
Machine Info

Quantity

Machine cost


Rental Date

10.9 User Interface Screen for Place order Agent



Form2

WELCOME AGENT



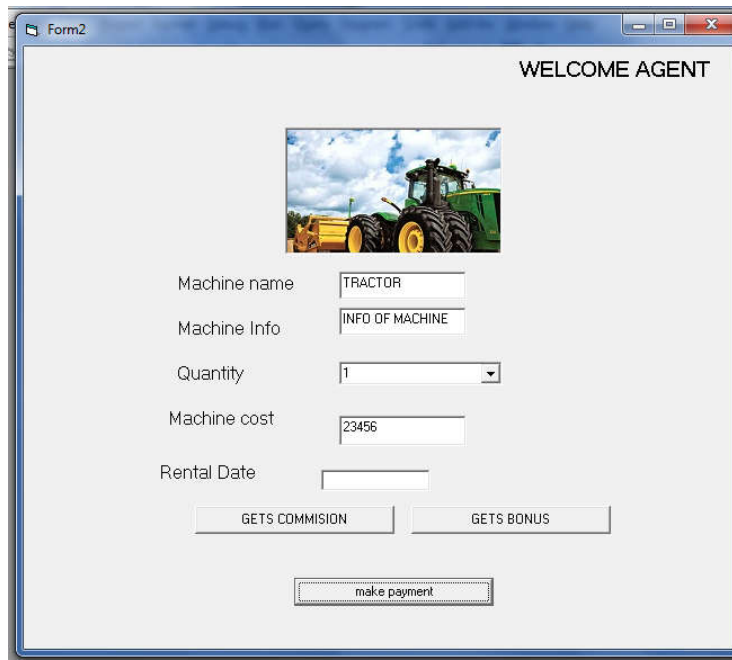
Machine name

Machine Info

Quantity


Machine cost

10.10 User Interface Screen for Rental Order agent



Form2

WELCOME AGENT



Machine name

Machine Info

Quantity


Machine cost

Rental Date

10.11 User Interface Screen for Make payment

Form2

WELCOME USER



Machine name: TRACTOR

Machine Info: INFO OF MACHINE

Quantity: 1

Machine cost: 23456

Rental Date: 12/05/2017

Print Invoice

10.12 User Interface Screen for Admin Homepage

Form1

WELCOME ADMIN

ADD MACHINERY

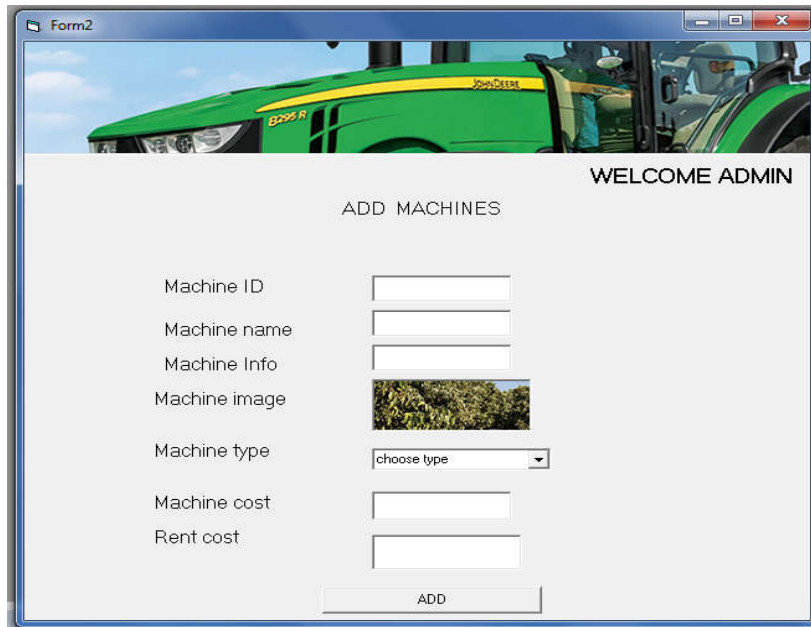
EDIT MACHINERY

REMOVE MACHINERY

VIEW BOOKING STATUS

VIEW MACHINE STATUS

10.13 User Interface Screen for Add machinery



Form2


WELCOME ADMIN

ADD MACHINES

Machine ID

Machine name

Machine Info

Machine image 

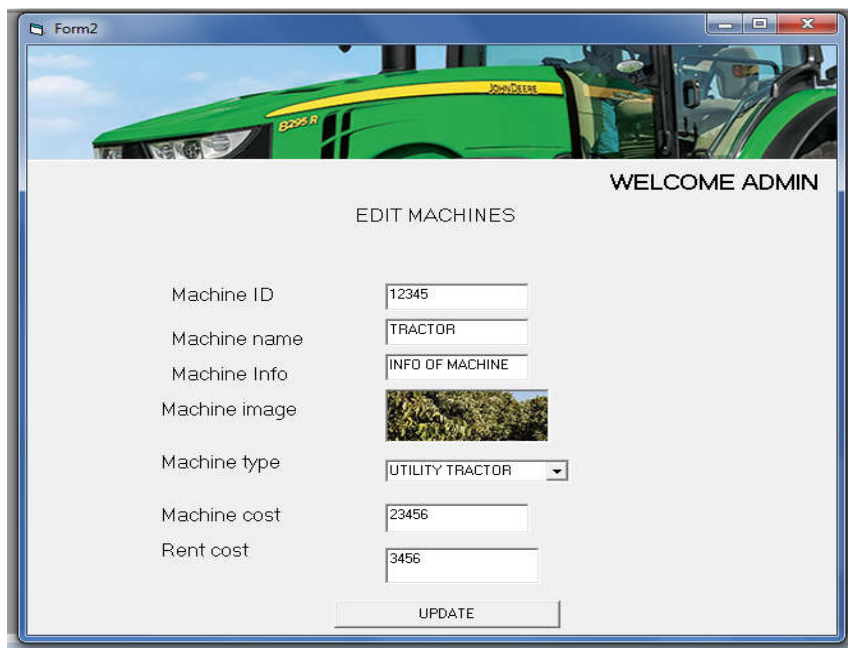
Machine type

Machine cost

Rent cost

ADD

10.14 User Interface Screen for Edit machinery



Form2


WELCOME ADMIN

EDIT MACHINES

Machine ID

Machine name

Machine Info

Machine image 

Machine type

Machine cost

Rent cost

UPDATE

10.15 User Interface Screen for Remove Machinery

Form1

WELCOME ADMIN

EDIT/REMOVE MACHINERY

Machine ID	Machine Name	Machine Cost	Action
SDF343535	TRACTOR	345363	EDIT X REMOVE

10.16 User Interface Screen for View Booking Status

Form1

WELCOME ADMIN

VIEW BOOKING STATUS

Machine ID	Machine Name	Machine Cost	Total Bookings
SDF343535	TRACTOR	345363	3435

10.17 User Interface Screen for View Machine Status

Form1

WELCOME ADMIN

VIEW MACHINE STATUS

Machine ID	Machine Name	Machine Cost	Available machines
SDF343535	TRACTOR	345363	3435

Section 11.Requirements Traceability Matrix

Requirement ID	Design Component
8.2.1	4.1,5.1,6.1,7.1
8.2.2	4.2,5.2,6.2,7.2
8.2.3	9.1,10.1
8.2.4	9.2,10.2

Section 12.References

Document No.	Document Title	Date	Authors
Version 2.0	Software Requirements Specification – Agricultural Heavy Machinery Renting/Sales Management System	27-aug-17	S PRAVEENKUMAR 17MCS0064 MOPURU RAVITHEJA 17MCS0065 JIJIRAJ J. 17MCS0074