



FACULTY OF COMPUTING AND INFORMATION TECHNOLOGY

BMIS2003 Blockchain Application Development

Assignment

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Tutorial Group: Group 2

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1.0 Introduction

KX's Farm is a Durian Track and Trace Blockchain Application (DTTBA) which is created to trace the production of durian starting from the farm until the durian reaches the customer. The main reason for using blockchain is that the use of blockchain can help in traceability. Besides that, blockchain ensures transactions are transparent and accountable which ensures the information to be secured.

The entire workflow involves the durian being harvested by the farmer. All the information related to the durian will be recorded in the blockchain by the workers in the farm, retail site and distribution center. Not only that, customers will be able to trace the origin of durian and rate it based on qualities like taste, fragrance, texture, creaminess and ripeness. These ratings will be recorded in the blockchain.

Farmers, retailers, distributor centers and the customers can access the web application to retrieve all the information regarding the transactions. For instance, retrieving the durian ID, harvest date and also the information about the distribution center.

2.0 Policy/ Business Rules

1. The blockchain durian application tracks the durian record and every role's ID.
2. The one who deploys the contract will be the owner of the contract.
3. Each durian must have a unique ID to be identified.
4. Each durian's trackable path is limited to durian trees, durian farms, farmer, distribution center, retailer.
5. Farmers can create or produce one or more durian records.
6. Farmers must record down the origin of durian, such as unique code and durian type.
7. Farmers can update the date passing to the distributor by entering the distributor ID, distributor centre address and the date passing to the customer.
8. Distributor must update the durian information from the farmer.
9. Distributors must update the date passing to the retailer by entering the durian ID and the date passing to the retailer.
10. Retailers must update the durian information from the distributor.
11. Retailers must update the date passing to the retailer by entering the durian ID, customer address and the date passing to the customer.
12. Customers can check for the origin and details, such as harvest time and arrival time of the durian before buying the durians.
13. Customers can buy one or more durians from the retailer.
14. Customers can rate the durian in terms of taste, fragrance, texture, ripeness and creaminess after buying the durian, and the customer ID will be recorded down.
15. Owner can check the rating of the durian bought and rated by the customer.

Roles

Owner

1. Deploy contract
2. Assign roles
 - a. Add farmer
 - b. Add distributor
 - c. Add retailer

Farmer

1. Create durian
2. Update date pass durian to distributor

Distributor

1. Update durian info from farmer
2. Update date pass durian to retailer

Retailer

1. Update durian info from distributor center
2. Update date of pass durian to customer

Customer

1. Register as customer
2. Rate durian
3. Preview durian information

3.0 Contract Diagram

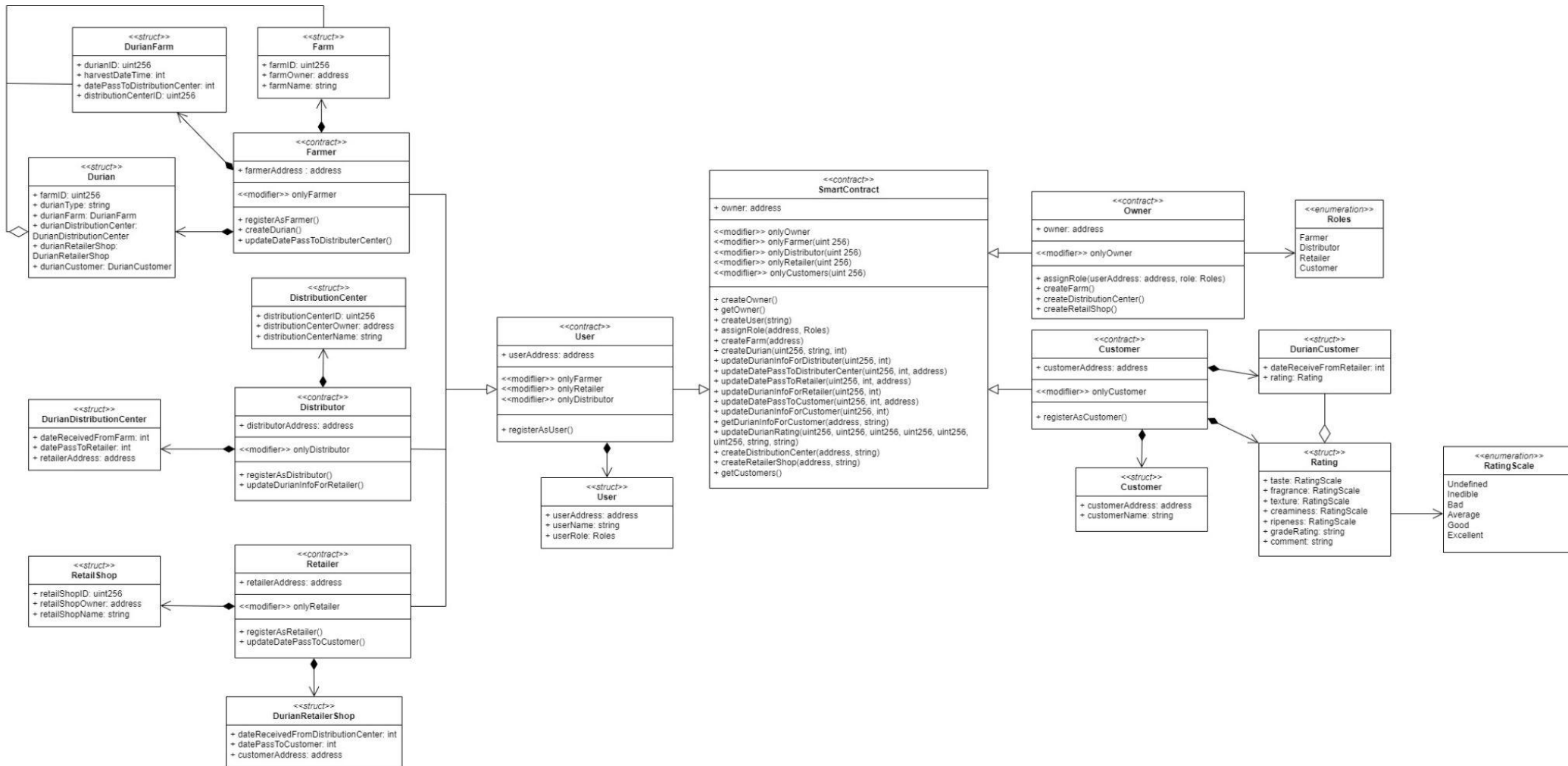


Figure 3.1 Contract Diagram for KX's Farm Durian Track and Trace Blockchain Application

4.0 Activity Diagram

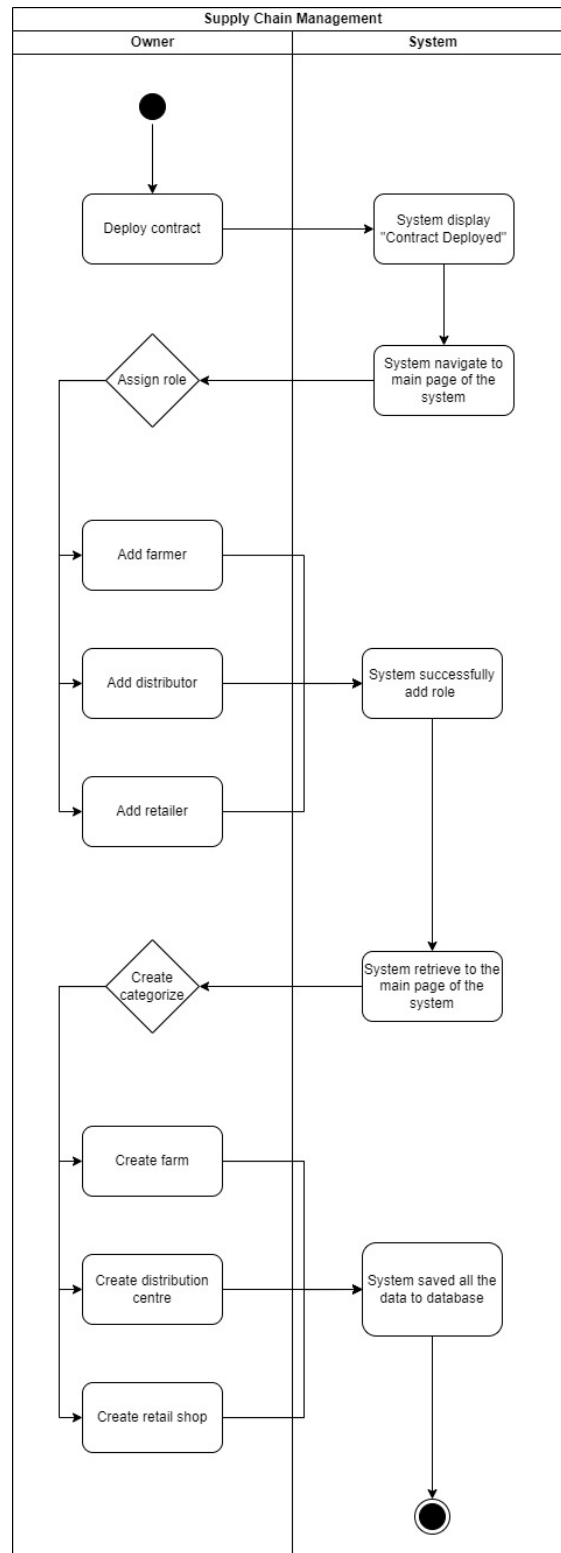


Figure 4.0a Owner Activity Diagram for KX's Farm Durian Track and Trace Blockchain Application

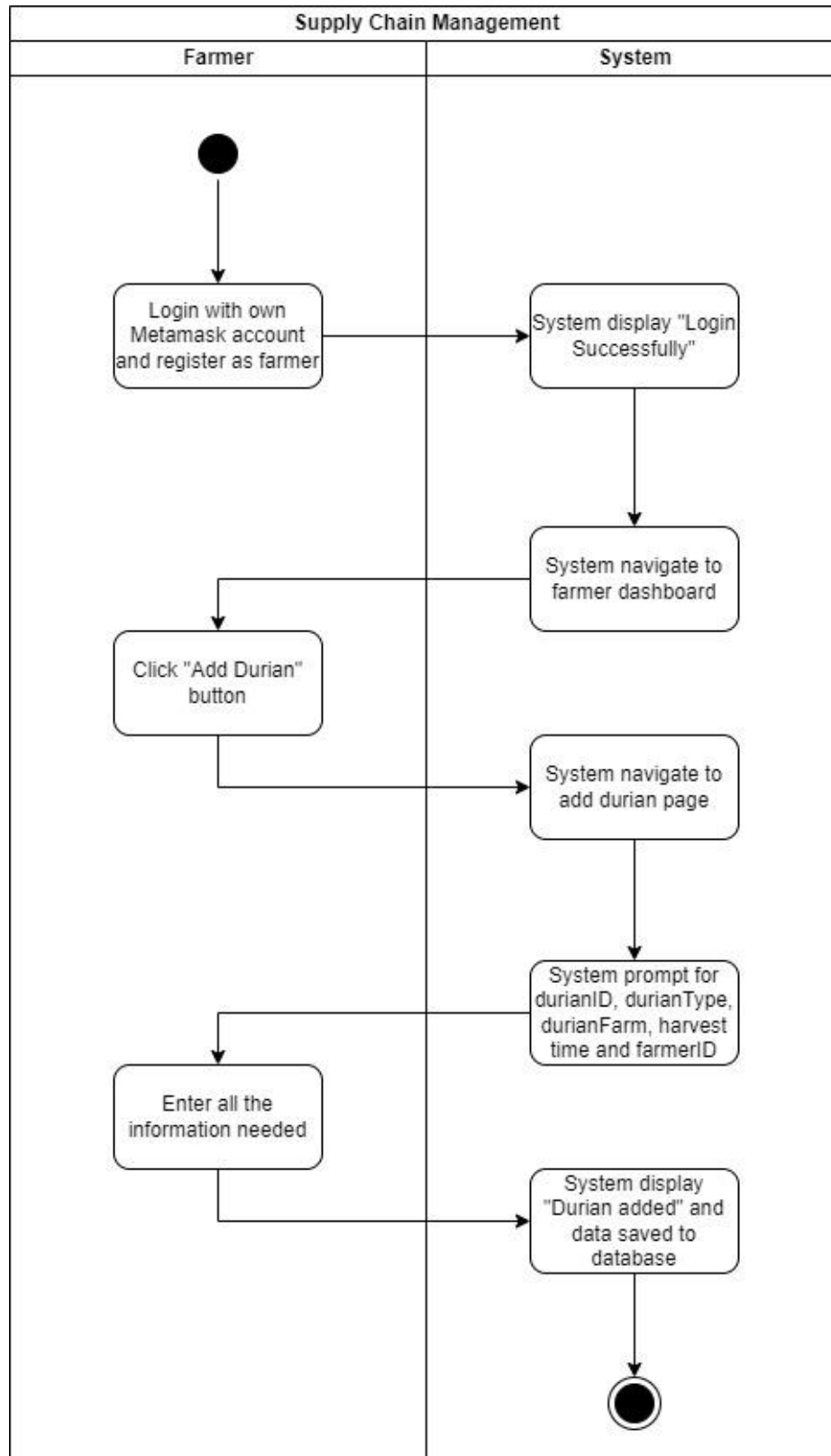


Figure 4.0b Farmer Activity Diagram for KX's Farm Durian Track and Trace Blockchain Application

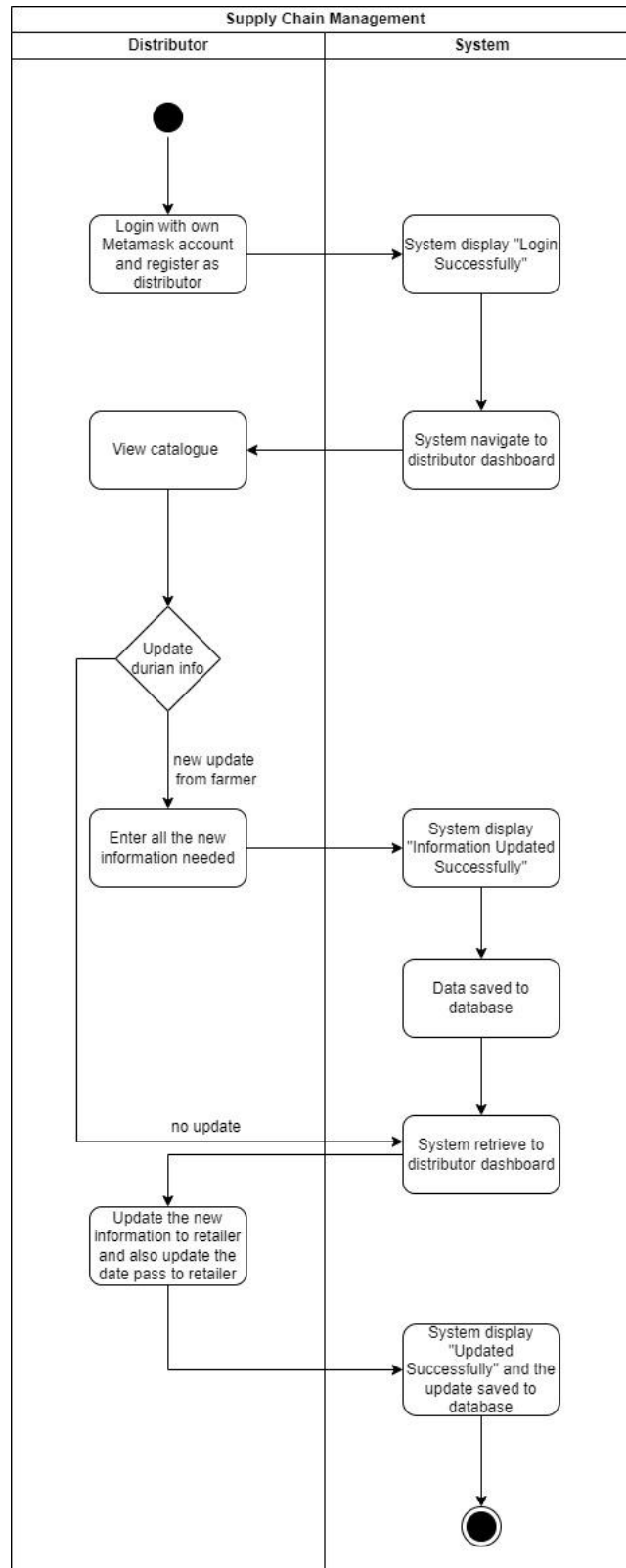


Figure 4.0c Distributor Activity Diagram for KX’s Farm Durian Track and Trace Blockchain Application

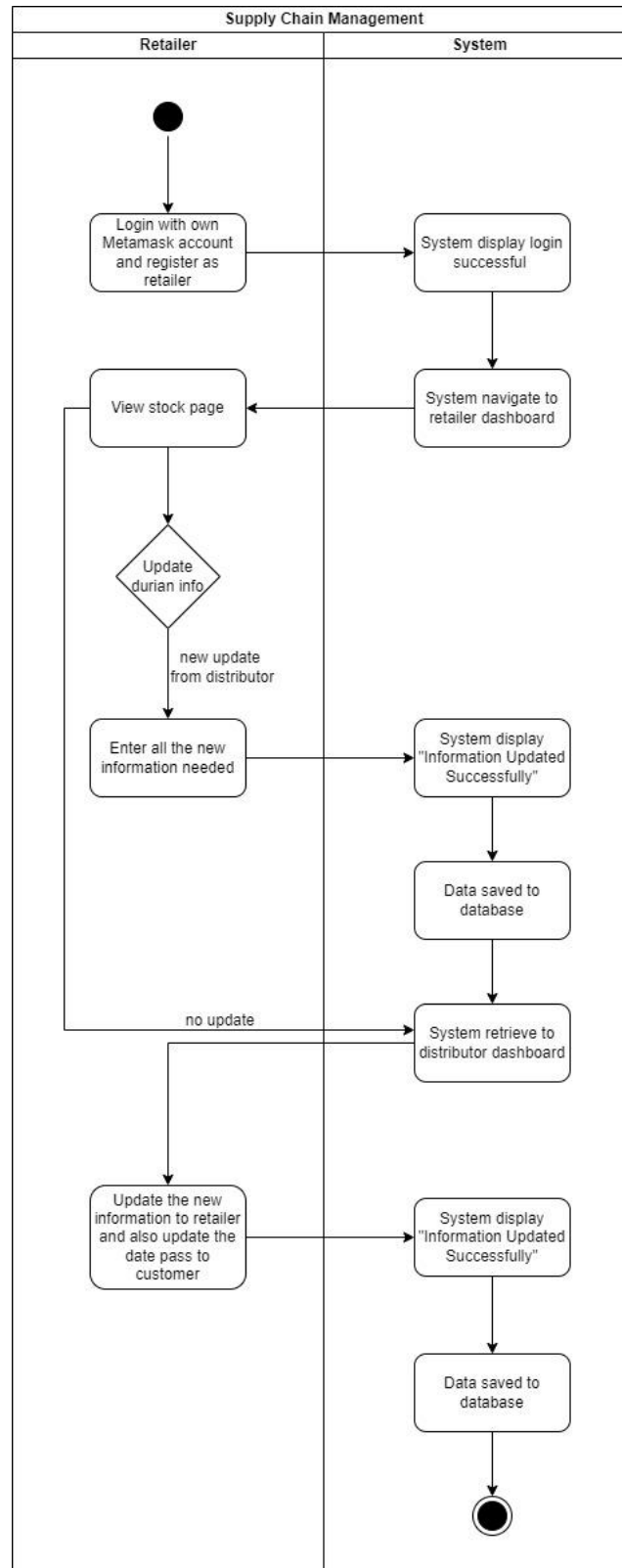


Figure 4.0d Retailer Activity Diagram for KX’s Farm Durian Track and Trace Blockchain Application

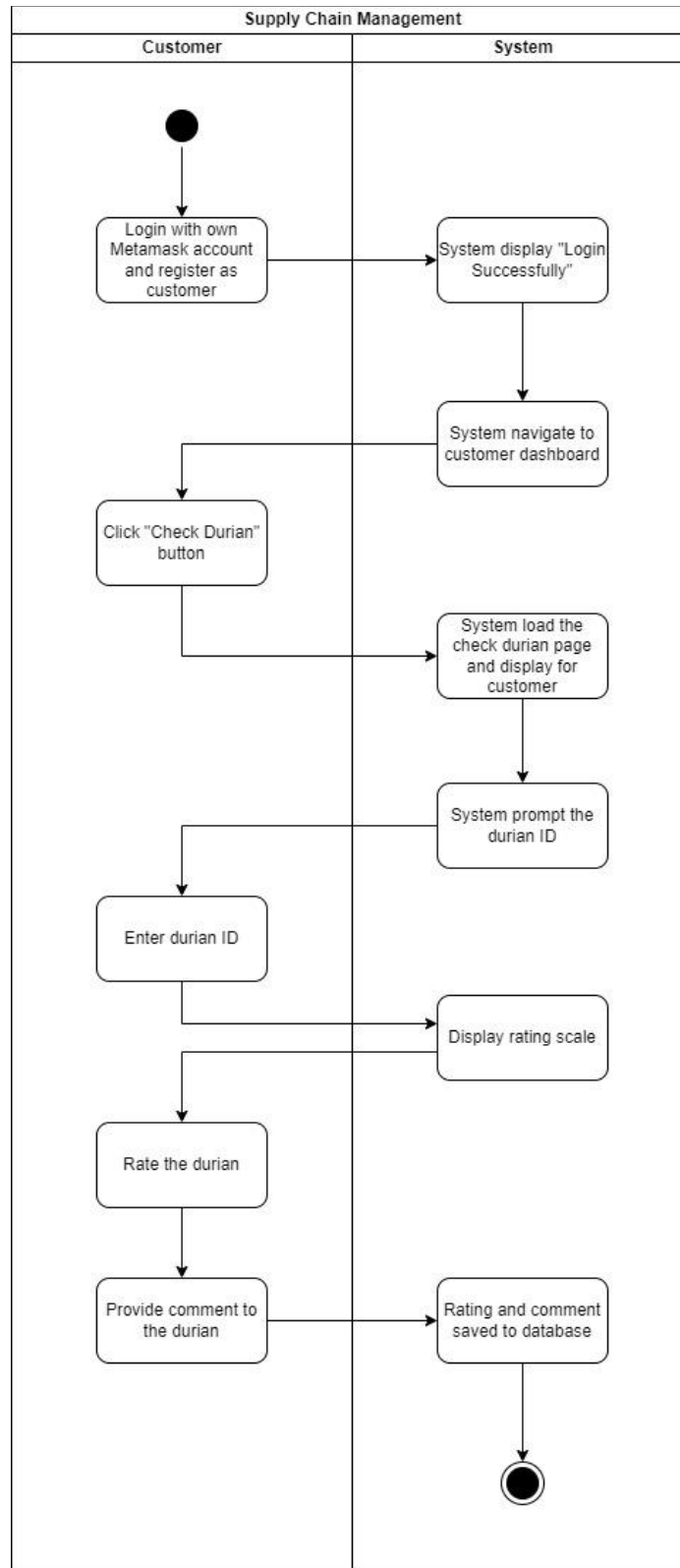


Figure 4.0e Customer Activity Diagram for KX’s Farm Durian Track and Trace Blockchain Application

5.0 Use Case Diagram

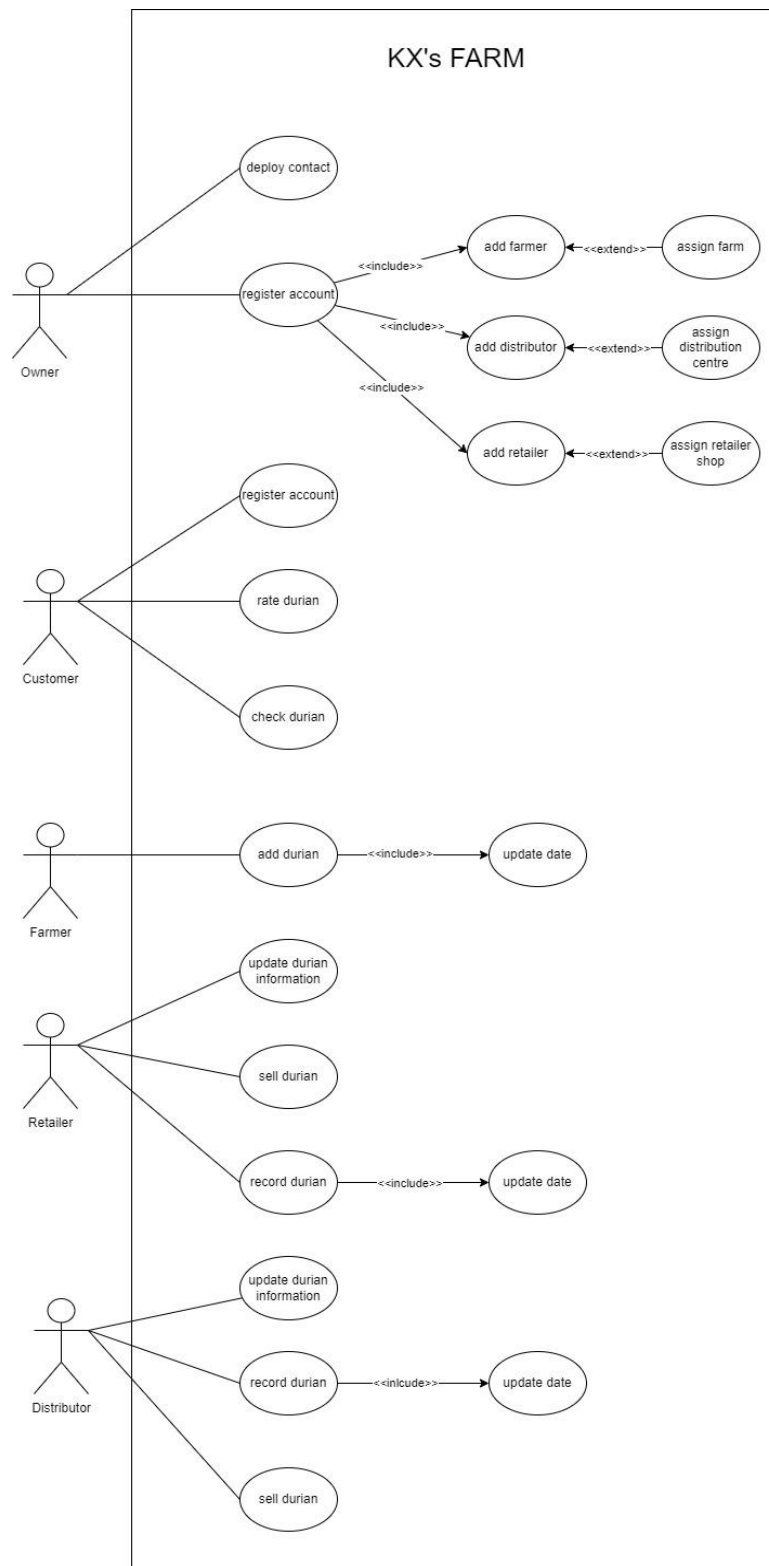


Figure 5.0a Use Case Diagram for KX's Farm Durian Track and Trace Blockchain Application

6.0 System Architecture/ Design Structure

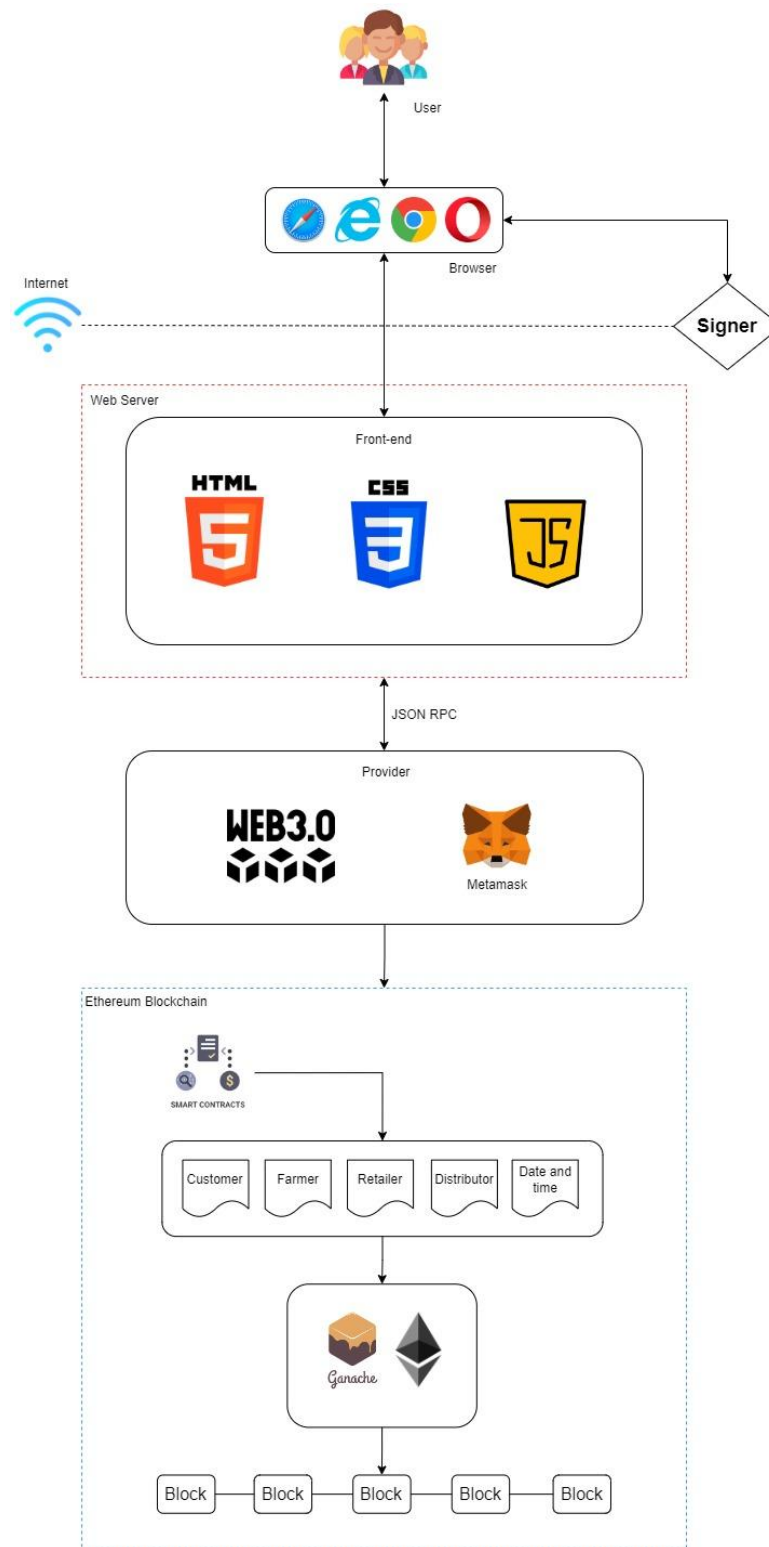


Figure 6.0a System Architecture for KX's Farm Durian Track and Trace Blockchain Application

7.0 UI Design

7.1 Home



KX's FARM

Durian Track & Trace

Secure and transparent tracking transactions

Account number:

Connect to Metamask

Connect Status:

Access Contract

Register as a Customer

Username:

Register

Figure 7.1a KX's Farm Home Page

7.2 Owner

Owner

Assign Role

User Address:

Role:

Assign Role

Create Farm

Owner:

Name:

Create Farm

Create Distribution Center

Owner:

Name:

Create Distribution Center

Create Retail Shop

Owner:

Name:

Create Retail Shop

Figure 7.2a KX's Farm Owner Page

7.3 Farmer


Farmer

Create Durian

Farm ID:

Durian Type:

Harvest Date: 

Harvest Time: 

Create Durian

Update Date Pass to Distributor

Durian ID:

Distribution Center Address:

Date Pass to Distribution Center: 

Update Durian


Figure 7.3a KX's Farm Farmer Page

7.4 Distributor

Distribution Center

Update Durian Info from Farmer

Durian ID:


Date Received From Farm: 

[Update Durian](#)

Update Date Pass to Retailer

Durian ID:

Retailer Address:

Date Pass to Retailer: 

[Update Date](#)

Figure 7.4a KX's Farm Distributor Centre Page

7.5 Retailer

Retailer

Update Durian Info from Distributor

Durian ID:

Enter Durian ID

Date Received From Distribution Center:

03/10/2023

Update Durian

Update Date Pass To Customer

Durian ID:

Enter Durian ID

Customer Address:

Enter Customer Address

Date Pass to Customer:

03/10/2023

Update Date

Figure 7.5a KX's Farm Retailer Page

7.6 Customer

Customer

Update Durian for Customer

Durian ID:

Date Received From Retailer: 

Update Durian

Rate Durian

Durian ID:

Rating Scale
0 - Undefined 1 - Inedible 2 - Bad 3 - Average 4 - Good 5 - Excellent

Taste:

Fragrance:

Creaminess:

Texture:

Ripeness:

Durian Grade:

Figure 7.6a KX's Farm CustomerPage

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Comment:

Provide a comment if any

Rate Durian

Durian ID:

Get Durian Info

Durian ID:	
Durian type:	
Farm ID:	
Harvest date and time:	
Date pass to distribution center:	
Distribution center ID:	
Date received from farm:	
Date pass to retailer:	
Retailer address:	
Date received from distribution center:	
Date pass to customer:	
Customer address:	
Date received from retailer:	
Taste:	
Fragrance:	
Texture:	
Creaminess:	
Ripeness:	
Grade:	
Comment:	

Figure 7.6b KX’s Farm Customer Page