**Project Name: Crop Prediction System**

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**Abstract:**

In our practical world it becomes very difficult for the farmers to predict the crops availability when it comes to the market. Sometime in return it results in huge losses if demand of food grains or fruits lowers down when abundant amount of grains are present in market while sometime demand may rise due to scarcity of food grains and fruits in the market.

Thus in such situation there is need of a centralize system which can be even own by the Government to keep tracks of ongoing yields in the farms. A certain provision is also needed for the farmers to sell grains and fruits which were yielded in the farms. This system is able to maintain records for:

1. Type of Crop which will be available in the market after certain amount of time
2. Monitoring of goods sold to the wholesaler by the farmer for appropriate price

The proposed system buyers or sellers can directly register in the site and sell/buy the product otherwise they can contact with a seller directly. Buyers can open the site and register with it and sell their products online. Crops Prediction is project builds a website which will help farmers to sell their products in different cities online.

**Implementation Technologies:**

1. **Spring Framework:**

Spring Framework is a Java platform that provides comprehensive infrastructure support for developing Java applications. Spring handles the infrastructure so you can focus on your application.

Spring enables you to build applications from “plain old Java objects” (POJOs) and to apply enterprise services non-invasively to POJOs. This capability applies to the Java SE programming model and to full and partial Java EE.

**1.1 Features of Spring Framework:**

**1. Lightweight**

Spring is modular lightweight framework which allows you to selectively use any of its modules on the top of Spring Core.

**2. Inversion of Control (IOC)**

This is another top feature of Spring framework where application dependencies are satisfied by the framework itself. Framework creates the object in runtime and satisfies application dependencies.

**3. Aspect Oriented Programming (AOP)**

Aspect Oriented Programming (AOP) is very popular in programming world and in Spring it is well implemented. Developer can use Aspect Oriented Programming (AOP feature of Spring to develop application in which business logic is separated from system services.

**4. Container**

Spring provides their own container for managing the bean lifecycle.

**5. MVC Framework**

Spring MVC Framework is used for developing MVC based web applications.

**6. Transaction Management**

Spring framework provides generic Transaction Management layer which can be used with or without J2EE(JEE) environment.

**7. JDBC Exception Handling**

Spring provides their own abstraction of JDBC exception which further simplifies the exception handling in program.

**1.2 Advantages of Spring Framework:**

**1. Solving difficulties of Enterprise application development**

Spring is solving the difficulties of development of complex applications, it provides Spring Core, Spring IoC and Spring AOP for integrating various components of business applications.

**2. Support Enterprise application development through POJOs**

Spring supports development of Enterprise application development using the POJO classes which removes the need of importing heavy Enterprise container during development. This makes application testing much easier.

**3. Easy integration other frameworks**

Spring designed to be used with all other frameworks of Java, you can use ORM, Struts, Hibernate and other frameworks of Java together. Spring framework do not impose any restriction on the frameworks to be used together.

**4. Application Testing**

Spring Container can be used to develop and run test cases outside enterprise container which makes testing much easier.

**5. Modularity**

Spring framework is modular framework and it comes with many modules such as Spring MVC, Spring ORM, Spring JDBC, Spring Transactions etc. which can used as per application requirement in modular fashion.

**6. Spring Transaction Management**

Spring Transaction Management interface is very flexible it can configure to use local transactions in small application which can be scaled to JTA for global transactions.

1. **The JDBC Template**

The central class of the Spring JDBC abstraction framework is the **JdbcTemplate** class that includes the most common logic in using the JDBC API to access data, such as handling the creation of connection, statement creation, statement execution, and release of resource. The**Jdbc-Template**class can be found in the **org.springframework.jdbc.core**package.

The **JdbcTemplate** class instances are thread-safe once configured. A single **JdbcTemplate** can be configured and injected into multiple DAOs.

We can use the **JdbcTemplate** to execute the different types of SQL statements. **Data Manipulation Language** (**DML**) is used for inserting, retrieving, updating, and deleting the data in the database such as **SELECT**, **INSERT**, or **UPDATE** statements

**2.1** **MySQL**

MySQL, the most popular Open Source SQL database management system, is developed, distributed, and supported by Oracle Corporation.

**Features of MySQL:**

* **MySQL is a database management system.**

A database is a structured collection of data. It may be anything from a simple shopping list to a picture gallery or the vast amounts of information in a corporate network. To add, access, and process data stored in a computer database, you need a database management system such as MySQL Server. Since computers are very good at handling large amounts of data, database management systems play a central role in computing, as standalone utilities, or as parts of other applications.

* **MySQL databases are relational.**

A relational database stores data in separate tables rather than putting all the data in one big storeroom. The database structures are organized into physical files optimized for speed. The logical model, with objects such as databases, tables, views, rows, and columns, offers a flexible programming environment.

* **MySQL software is Open Source.**

Open Source means that it is possible for anyone to use and modify the software. Anybody can download the MySQL software from the Internet and use it without paying anything.

* **The MySQL Database Server is very fast, reliable, scalable, and easy to use.**

MySQL Server was originally developed to handle large databases much faster than existing solutions and has been successfully used in highly demanding production environments for several years. Although under constant development, MySQL Server today offers a rich and useful set of functions. Its connectivity, speed, and security make MySQL Server highly suited for accessing databases on the Internet.

* **MySQL Server works in client/server or embedded systems.**

The MySQL Database Software is a client/server system that consists of a multithreaded SQL server that supports different back ends, several different client programs and libraries, administrative tools, and a wide range of application programming interfaces (APIs).

1. **Hardware and Software Requirements (Minimum)**

**Hardware:**

1. Intel i3 processor 3rd generation or later / AMD Ryzen 200 2nd generation or later

2. 2 GB ddr3 ram.

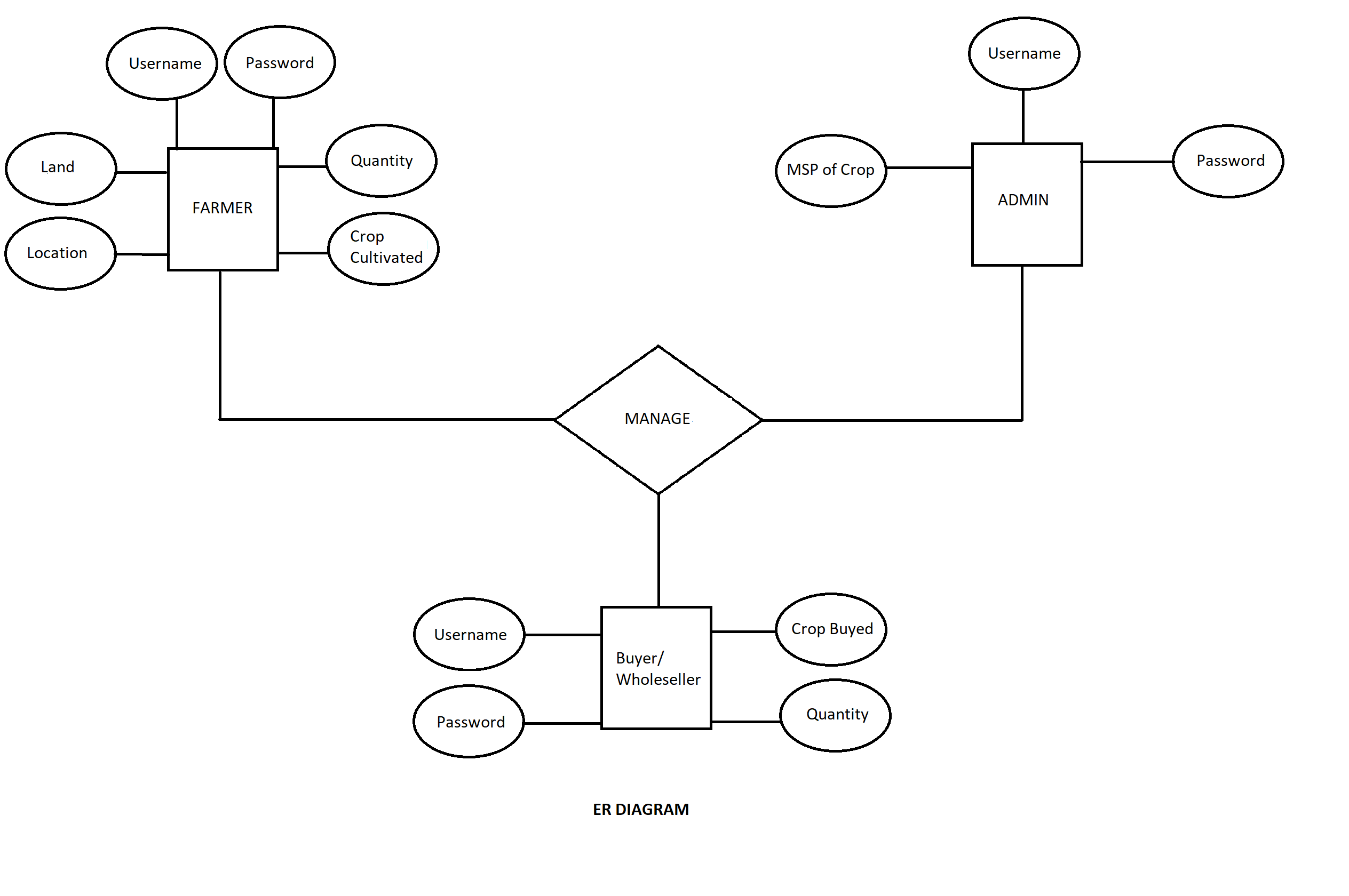
3. Windows 7 Home edition or later.

4. 200 GB Sata HDD Space

5. Data Connection 200 kbps

**Software:**

1. Eclipse 4.7 Oxygen
2. MySQL 5.7 with Workbench 8.0
3. Google Chrome version 79.0
4. Apache Tomcat Server 8.5
5. Maven Dependencies
6. **ER Diagram:**



**4) Table Structures:**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Farmar | | | | | | | | | | | | |
| Fid | Fname | Lname | land | crop | password | townname | contact |  | repocrop | repo | email |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
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|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Buyer | | | | | |
| Bid | Bname | Lname | password | contact |  |
|  |  |  |  |  |  |
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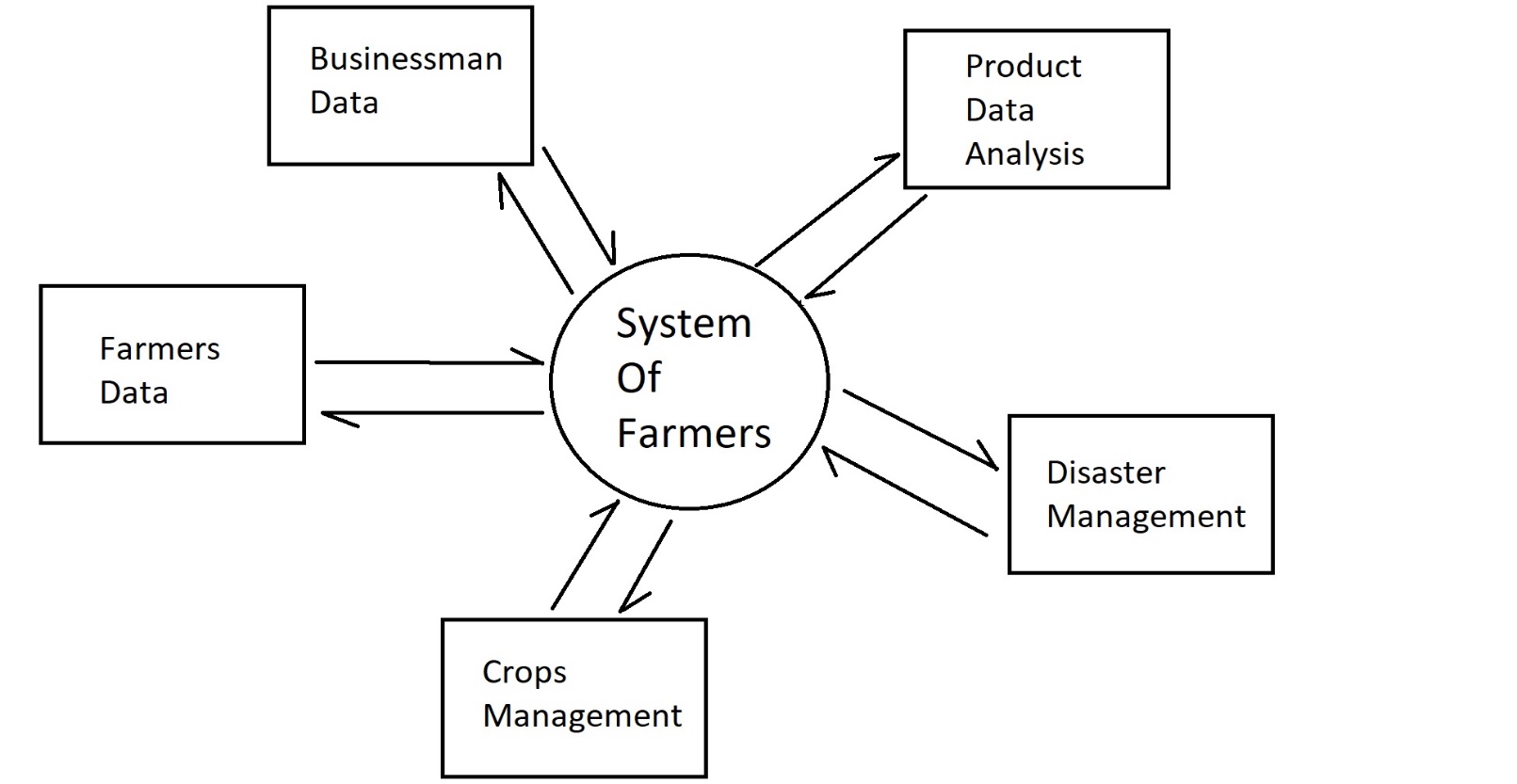
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Admin | | | | |
| Fid | email | Fname | Lname | password |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Order | | | | | | |
| oid | fid | crop | bid | status | amount | price |
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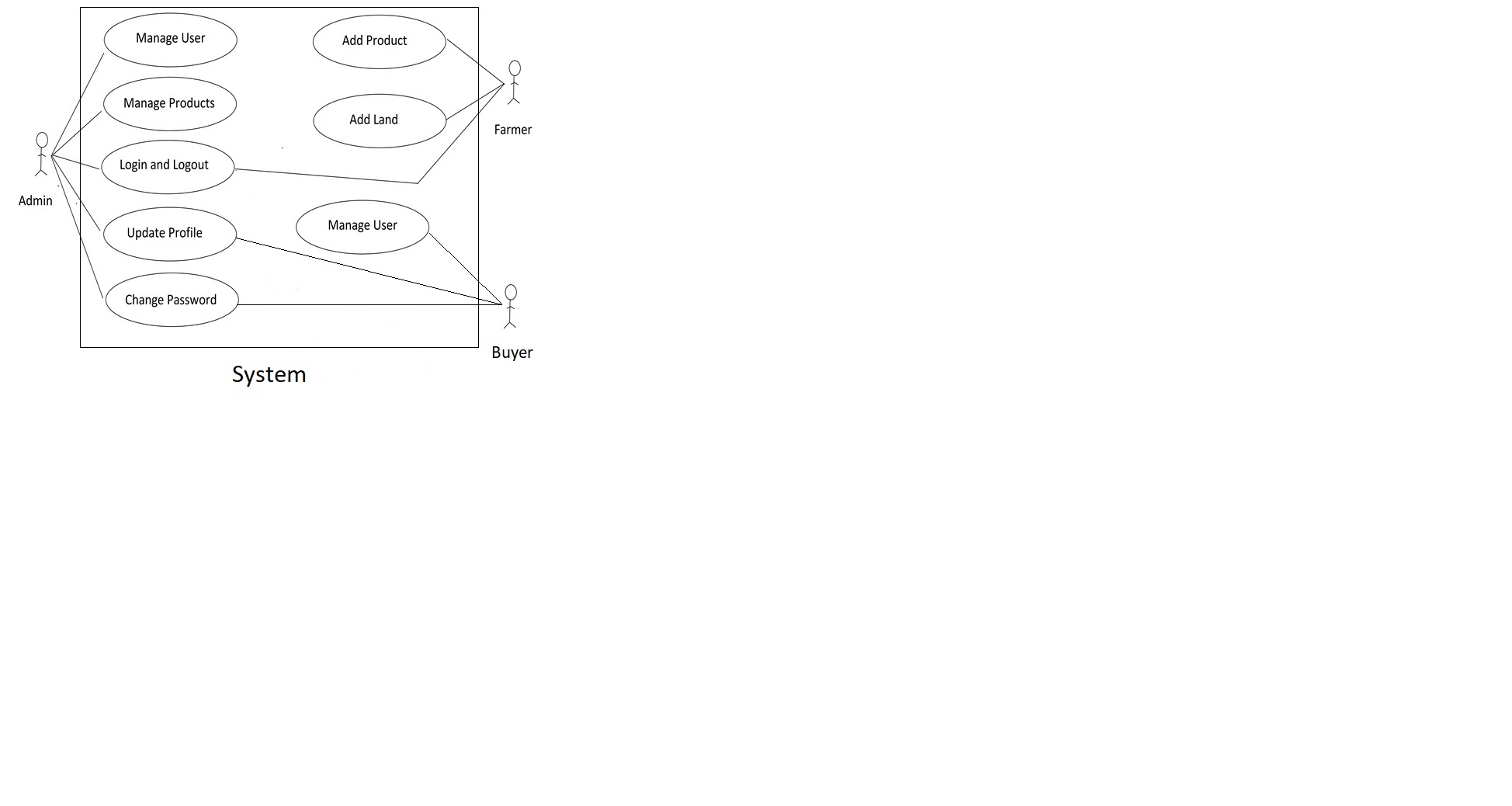
|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CropInfo/ProductInfo | | | | | | | | | |
| id | fid | cname | farmsize | WaterSourse | Harevest per acers | time | total harvest | | Price |
| 1 | 1 | Onion | 2acres | rain water | 8 Quintals | 5 months | 16 Quintals | | 48000 |
| 2 | 2 | tomato | 1acres | well,rainwater | 12 tonnes | 2months | 12tonnes |  |  |
| 3 | 3 | Onion | 1acres | river,well,rainwater | 8 Quintals | 5months | 8Quintals |  | 24000 |

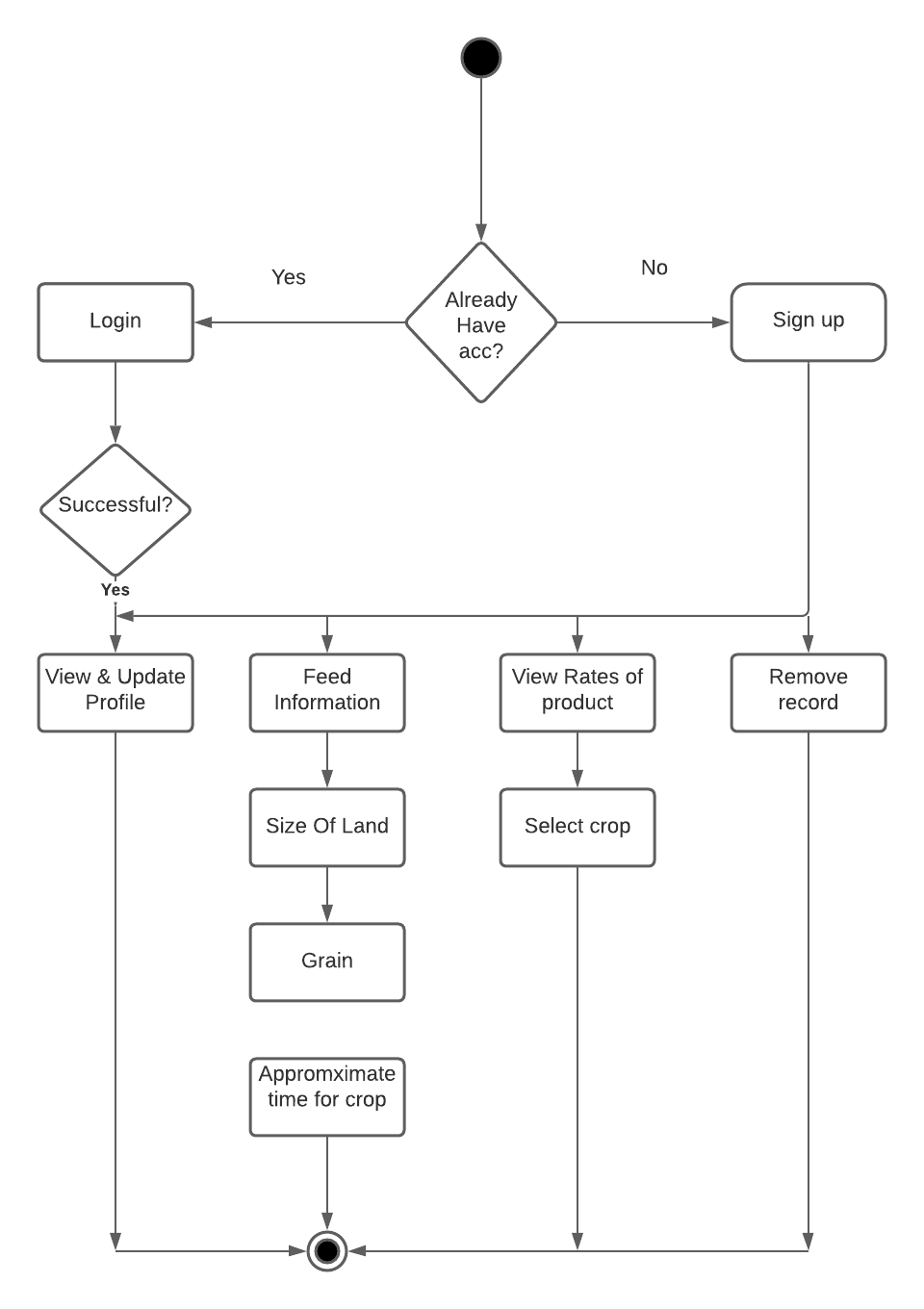
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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| pradiction |  |  |  |  |  |  |  |  |
| Crop | quantity | msp | quantity - addition of total harvest |  |  |  | Remaining |  |
| Onion | 50 | 3000/quintal | 50-30 |  |  |  | 20 |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |

1. **UML Diagrams:**



2) Usecase diagram



**Activity diagram:**

**End to End Flow of Application:**

**a) Farmers Module:**

- As a module it consist of ‘login’ and ‘sign-up’ options. The farmers have to sign-up up by providing their basic information. This information consist of:

FID, First Name, Last Name, Contact, Crop Info, Town, Water Source, Repo Crop, Quantity, Farm/Land info, e-mail, Login Id and password

- After sign-up the information will be stored under MySQL database as back-end. This information will be used to ensure the quantity of crops cultivated at a particular area.

- Once a farmer becomes a member of the system he would be also able to sell the cultivated crops from the system itself.

- He just need to sign-in from the system with his Login-Id and password and whatever he sells will be assigned to buyer’s-Id number.

- Once all the information about the crops yield is stored it will be used for analysis purpose for future prediction

**b) Buyers Module:**

- This module is for the wholesaler who is willing to buy food grains and fruits from the system in large quantity.

- As that of farmers module he just need to sign-up with his basic information which consist of:

First Name, Last Name, e-mail, Login-Id and password

- This information will be saved in separate MYSQL database for buyers for identification. He can sign-in by clicking Buyers Module option.

- Once he enters the system he will be directly able to buy the food grains and fruits available in the table or can even directly call the farmer.

**c) Admin Module:**

- This module consist of a centralized person who is responsible to maintain all the information about the prediction and analysis of the yielded crop in the coming future.

- The basic information about the Admin will be stored that will be:

First Name, Last Name, Admin-Id, e-mail, Login-ID and password

- He can be any person hired directly by the Government or any Private Organization.

- He has the right to maintain track or delete any user from the system.

**Thank You!**