Software Requirements Specification

AGRO - Agricultural Management System

Version 2.0 approved

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Revision History

Name	Date	Reason For Changes	Version
AGRO - Agricultural Management System	30/7/21	First Specification	1.0
AGRO - Agricultural Management System	26/9/21	Adding Analysis Models to SRS	1.1
AGRO - Agricultural Management System	14/11/21	Modification of Functional Requirements and Analysis Models	2.0

1. Introduction

1.1 Purpose

The purpose of this document is to present a detailed description of the Agricultural produce management system. It will explain the purpose and features of the system, the interfaces of the system and what the system will do. This document is intended for the developers of the system.

1.2 Document Conventions

This specification document serves as a reference point during the development process and captures requirements that need to be met by the software product. It has been created based on the IEEE template for System Requirements Specifications documents.

1.3 Intended Audience and Reading Suggestions

This document is intended to be read by farmers, NGOs that are interested in helping farmers and organizations/ministries that intend to help farmers. The remainder of the document contains the details about the environment used to create this software, interfaces, features and requirements of the software. For farmers and NGOs, it is suggested to start reading this document from the features section and for organizations/ministries, start reading from the overall description section.

1.4 Product Scope

This system is designed to connect farmers who sell their produce to their buyers via an auction feature. This ensures a minimum pay for the farmers if not a higher price for their produce. Making a union will also be possible if a group of farmers decide to cooperate and sell their produce together. Users can raise queries for their enhancement in the Agricultural Field.

1.5 References

- Roger S.Pressman, “Software Engineering A Practitioner's Approach” 8th Edition. McGraw-Hill Education, 2015.
- Booch G, Maksimchuk RA, Engel M W, Young B J, Conallen J, Houston K A, Object Oriented Analysis and Design with Applications, 3rd Edition, Addison-Wesley, 2007.
- Agriculture Management System, From:https://studentprojectguide.com/php/agriculture-management-system/.

- Agriculture Management System Project, From:https://www.freestudentprojects.com/studentprojectreport/projectreport/agriculture-management-system-project/.
- Development of an Agricultural Management Information System based on Open-Source Solutions, From:https://www.sciencedirect.com/science/article/pii/S2212017314003272/pdf?md5=d4bfe028da8f3d88de56b146028eeb99&pid=1-s2.0-S2212017314003272-main.pdf.

2. Overall Description

2.1 Product Perspective

The software is designed to be a standalone system that might replace the current ways of selling produce and help reframe the method of payment for farmers. It is designed so as to make sure farmers are not exploited and the software is used in a widespread manner like a government funded app.

2.2 Product Functions

- *The system should let the user know about data like seasons and crop type.*
- *It should make Users able to raise queries via Help and Support Portal where Admins respond to them.*
- *It should also allow produce to be sold by auction method with base price set by the users.*
- *It should also update the users with news updates and government schemes.*

2.3 User Classes and Characteristics

There are 3 kinds of users for the proposed system.

- ***Administrators:*** *Administrators are the ones who can add or administer the categories for the products, and administers the all website information. Administrator has full privilege of the website.*
- ***Sellers:*** *Sellers are the farmers and they can sell their productions online after the registration. After the registration the farmers can login to the system by entering login id and password.*
- ***Customer:*** *Customers can buy products online. The customer can send a purchase request to check the quality of the products.*

2.4 Operating Environment

This system is designed to serve as a web application and thus, would allow access regardless of the platform and operating system. This application can be operated in any web browser like Google Chrome, Mozilla Firefox, Brave, Safari, etc. Any smartphone or PC with a stable internet connection would have access to this web application. It will make use of certain inbuilt features of the device like Temperature and Location to deduce the climate and weather.

2.5 Design and Implementation Constraints

- *Regulatory policies - As per Govt. Directives.*
- *Dependency on connectivity, bandwidth constraints in different regions across the country for Web/Mobile based interface.*
- *Unexpected increase in the number of concurrent User requests during peak transaction period.*
- *Identification of the User who will enter the data in a different role in the process flow of the system.*
- *The Users will be accessing the software application using various connectivity scenarios.*

2.6 User Documentation

The application shall have tutorial documentation, for the purpose of educating new users as well as acting as a reference. Clear procedures and proper protocol must be explained in detail, as often these tasks must respect both legal and business concerns. These procedures shall be presented in step-by-step instructions which are accompanied by both screenshots and in application tooltips. The goal here is to produce an interface which can self-teach its own practice to any first-time users.

2.7 Assumptions and Dependencies

- *It is assumed that all the Users can access the system through the internet.*
- *The administrators can also access the system through the internet.*
- *Common features including Login, Logout, Forgot password, Change Password, User management features etc. which will be generally used across all software applications will be developed commonly and uniformly.*
- *The web browser shall be latest and all the plug-ins will work on the client machines to access the Portal.*
- *Mobile number is correct.*
- *The farmers scan the documents and upload the same. The user can also upload the Audio/Videos/Presentations/Text.*
- *The Web services provided by external servers are able to give the data.*

3. External Interface Requirements

3.1 User Interfaces

The user interface for the system will be a web page on the Internet. The user interface will be limited to the types of controls that can be generated using HTML and JavaScript. The interface allows users the access to information about the seasons, schemes and subsidies for viewing and the e-commerce and support sections are interactive. The e-commerce interface allows users to buy products for their needs and the support will have an FAQ and a service to help the users. The Granaries interface will allow the user to search for granaries or storage locations nearby listed on the site and if interested, can connect to the manager of the storage location.

3.2 Hardware Interfaces

- *The website will be accessible to users who use a computer with any OS specifications and also on smartphones which can allow access to location settings.*
- *The nature of data will be both quantitative while used in auctions, granaries and e-commerce while it is also qualitative in case of schemes and subsidies, seasons interfaces.*

3.3 Software Interfaces

- *Front-End Development for this web application is carried out using programming languages such as HTML, CSS and JavaScript.*
- *Middle-End Development is carried out using programming languages such as Node.js.*
- *Back-End Development is carried out using programming languages such as Java.*
- *Databases at which data can be stored for this application are MongoDB*
- *Platforms at which this application can be operated are web browsers like Google Chrome, Mozilla Firefox, Brave, Safari, etc. and this web application works irrespective of operating systems.*

3.4 Communications Interfaces

Agricultural Produce Management System web application should be securely accessible through internet communication channels (wired or wireless). Most commonly used protocol for development of web applications is HTTPS Protocol.The features in the application like creation of profiles, unions will need to be secure so as to protect credentials and information about the users. Thus, HTTPS is a secure protocol serving this purpose.

4. System Features

4.1 Description and Priority

The Agricultural Produce portal is very useful for the farmers and the buyers of the farmers goods. This portal is an entrypoint to a large number of disparate sub-sites or external sites and will typically try to attract a high volume of traffic by linking to a wide range of interesting content and other features.

4.2 Stimulus/Response Sequences

- *The User can search for the seasons and the crops that have to be cultivated in the particular seasons.*
- *Users can send queries at Help and Support Portal and Admins respond to them via E-Mail or Chat.*
- *The User can know about the schemes introduced by the government.*
- *Overall this portal displays the relevant information regarding the types of crops and seasons and helps the farmers in selling the crops at good prices.*

4.3 Functional Requirements

4.3.1 Seasons and Produce:

This portal gives details about the kinds of seasons and the kinds of crops that can be cultivated.

4.3.2 Auction Features:

This portal has an auction feature. So that the farmers can sell their goods following the auction methodology to the buyers. So that the farmers will get very good pay for their produce.

4.3.3 Union Making:

This portal has an union making options for the farmers so that they can collaborate and sell their goods together.

4.3.4 News Feed:

This portal has News feed features that tells about the new Schemes and Subsidies introduced by the farmers.

4.3.5 Help and Support:

This portal help Users to clarify queries via Contact Us Feature where they can send their details along with queries. Admins respond to those queries as soon as possible.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

- *There is no restriction on the number of the users to be added to the database.*
- *A stable internet connection of above 2 Mbps is required for accessing and operating the website.*

5.2 Safety Requirements

- *There shall be strong security mechanisms in the server side of the website to keep unwanted users from hacking the website.*
- *However, all users of the system give and store the privacy details and details related to personal information in the database. However, our system is accessed online.*
- *So, we need a very secure system as far as security is concerned such as using HTTPS Protocol.*
- *Data from the database must never be transmitted to unauthenticated sources.*
- *The website must never disclose information to users who are not authorized to see it.*
- *The website does not disclose user information to any other third parties.*
- *The website is strongly encrypted with current standards.*

5.3 Security Requirements

- *Passwords shall be displayed as "*" in the web pages whenever required.*
- *Proper authentication is required for users to access any of the web pages including the home page.*
- *Every user of the system is assigned a unique login and password to access the web application over the internet.*
- *Microsoft .NET framework ensures security of data, for example passwords that are being transmitted over the internet.*
- *Credentials of the user must be recorded in the database.*
- *All user information stored on the database must be encrypted for security purposes.*
- *Communication between the website and database must be encrypted such as sending or retrieving information.*

5.4 Software Quality Attributes

- ***Consistent****. The website should have a similar look and feel on every page. Every page should have the same header/logo, heading style, fonts, navigations etc.*
- ***Efficient and easy to maintain****. This refers to the fact that there is a need to separate content from layout, so that you can easily change your page design without editing every page on the site.*
- ***Layout****. The layout of each page should have a good contrast between the text and background area. This helps considerably with visibility as it will be difficult to read the text if it is almost the same colour as the background. Monitor size should also be taken into consideration.*
- ***Easy to navigate and use****. Users should not have a hard time trying to navigate the site. Navigation links should be consistent and clearly labelled. All navigation links should also be working properly and should point to the intended page/site.*
- ***Browser compatible****. When designing the site consider different browser environments. Extensive testing should be done on each page in all the major browsers and the design changed appropriately to cater for all.*
- ***Visually appealing****. The use of colour, text, fonts and graphics should be carefully considered and used to ensure that the site is visually appealing to its visitors.*
- ***Speed****. The performance of a website is mostly rated by its up -time and downtime. These terms refer to the amount of time it takes the site to respond to requests. Graphics should be kept to a minimum to allow the site to load faster. The pages on the site should load within an acceptable time e.g., under 10 seconds.*
- ***Maintainability.*** *The code and design need to be documented well enough and designed such that a new project member with the same amount of academic and co-op experience can easily ramp up the project.*

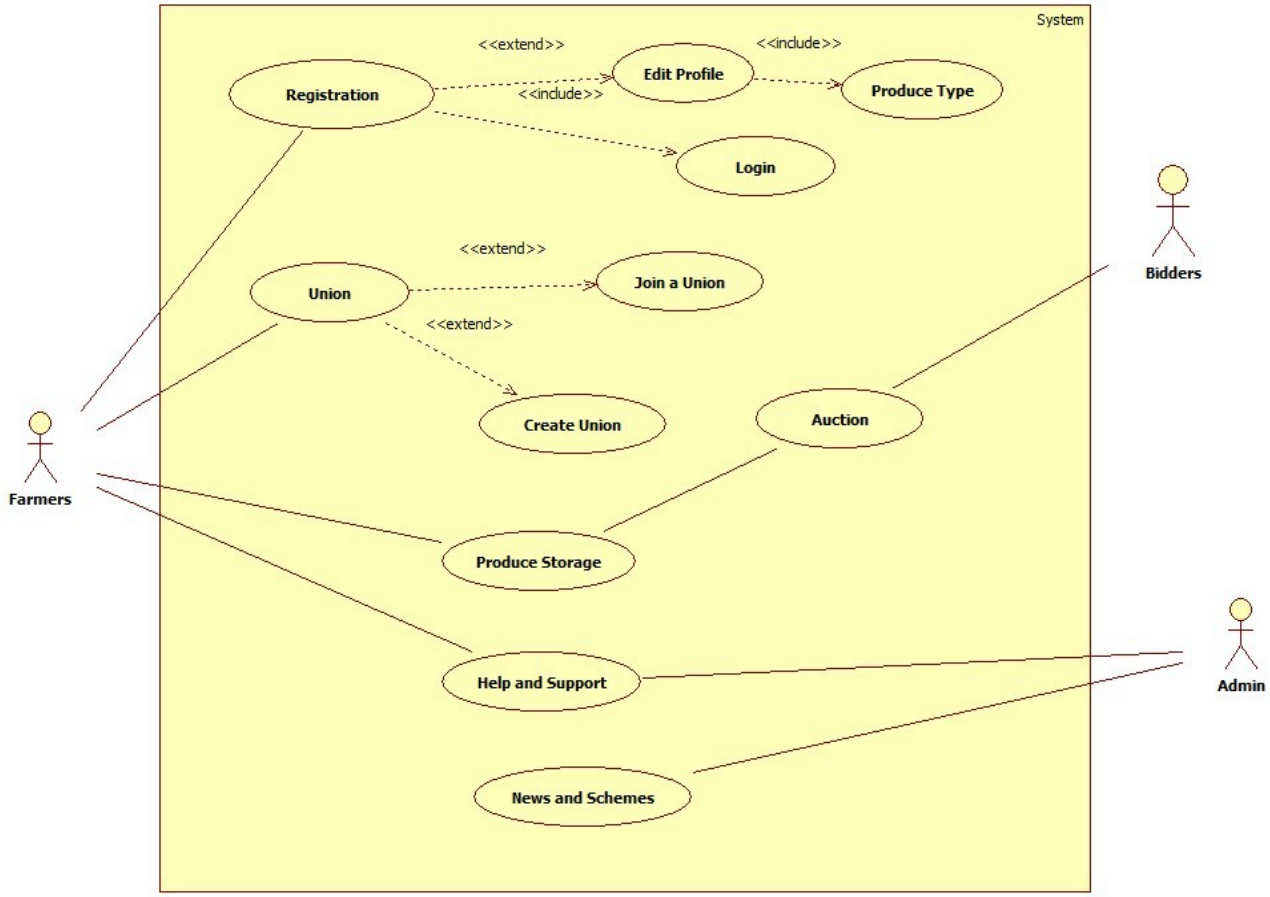
5.5 Business Rules

- *A business rule is anything that captures and implements business policies and practices.*
- *A rule can enforce business policy, make a decision or inform new data from existing data.*
- *This includes the rules and regulations that the system users should abide by.*
- *This includes the cost of the produce and discount offers provided.*
- *The users should avoid illegal activities and protocols and also neither admins nor members should cross the rules and regulations.*

6. Other Requirements

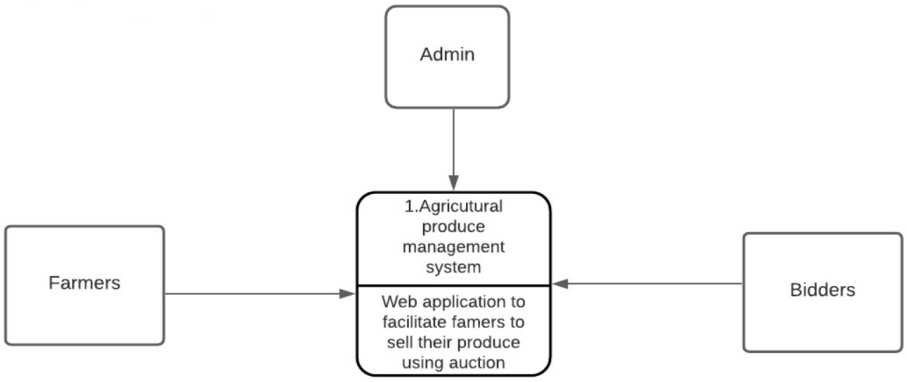
Appendix: Analysis Models

- ***USE-CASE DIAGRAM:*** *The Use-Case Diagram below shows the Use-Cases and how the Actors interact with them.*

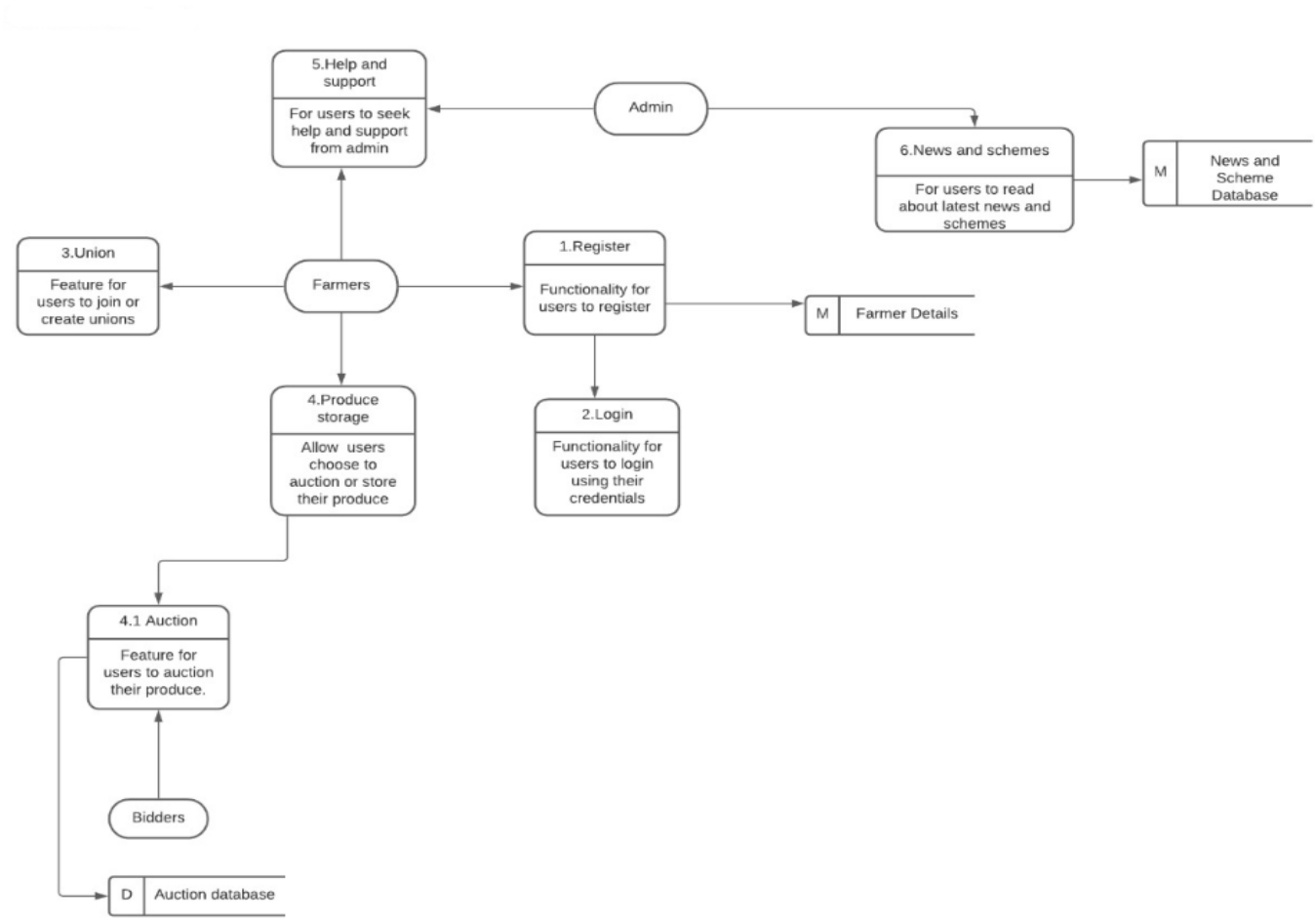


- ***DATA FLOW DIAGRAM:*** *The Data Flow Diagram below shows how data flows through all processes provided in this system.*

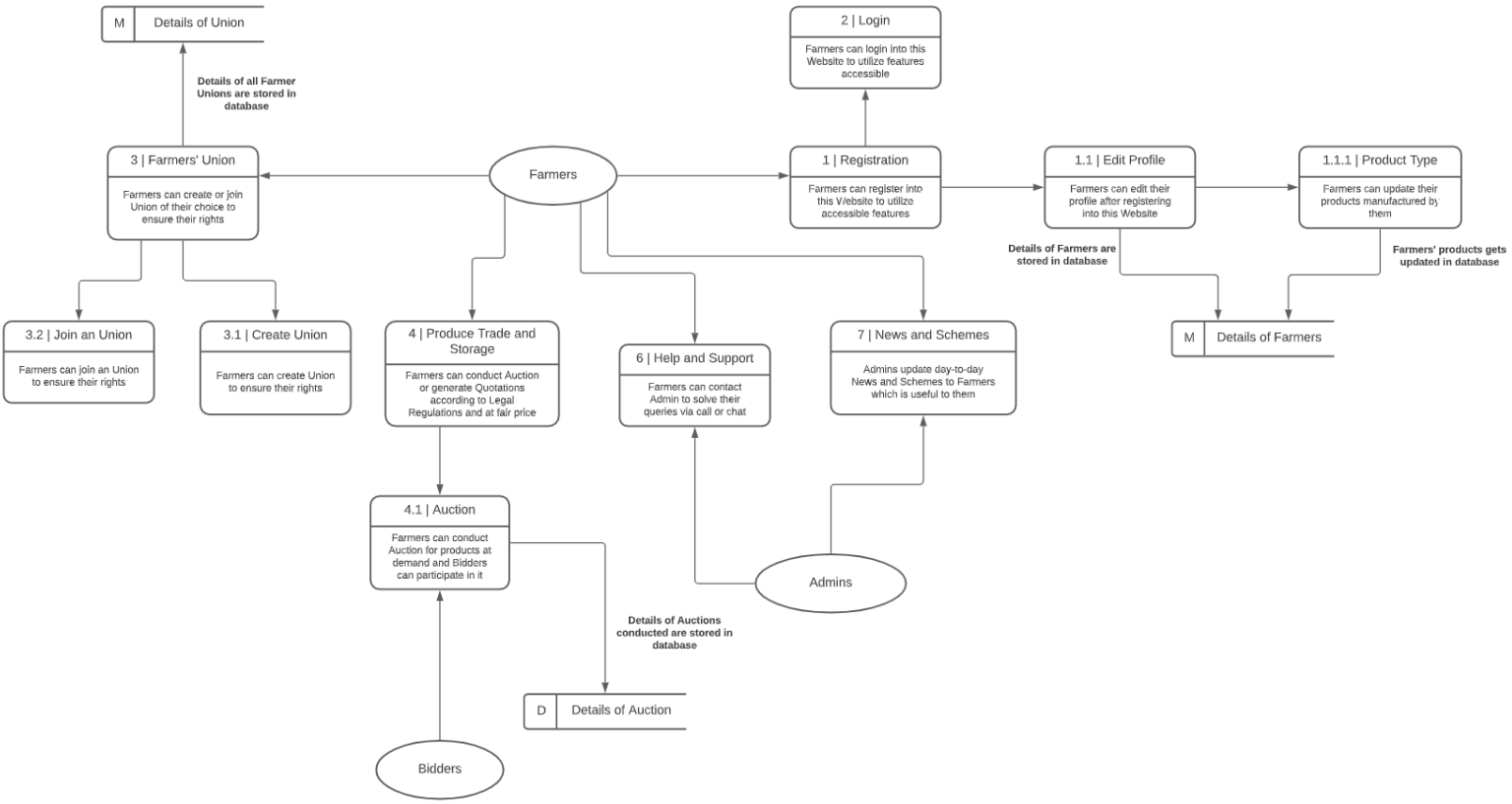
DATA FLOW DIAGRAM LEVEL 0:



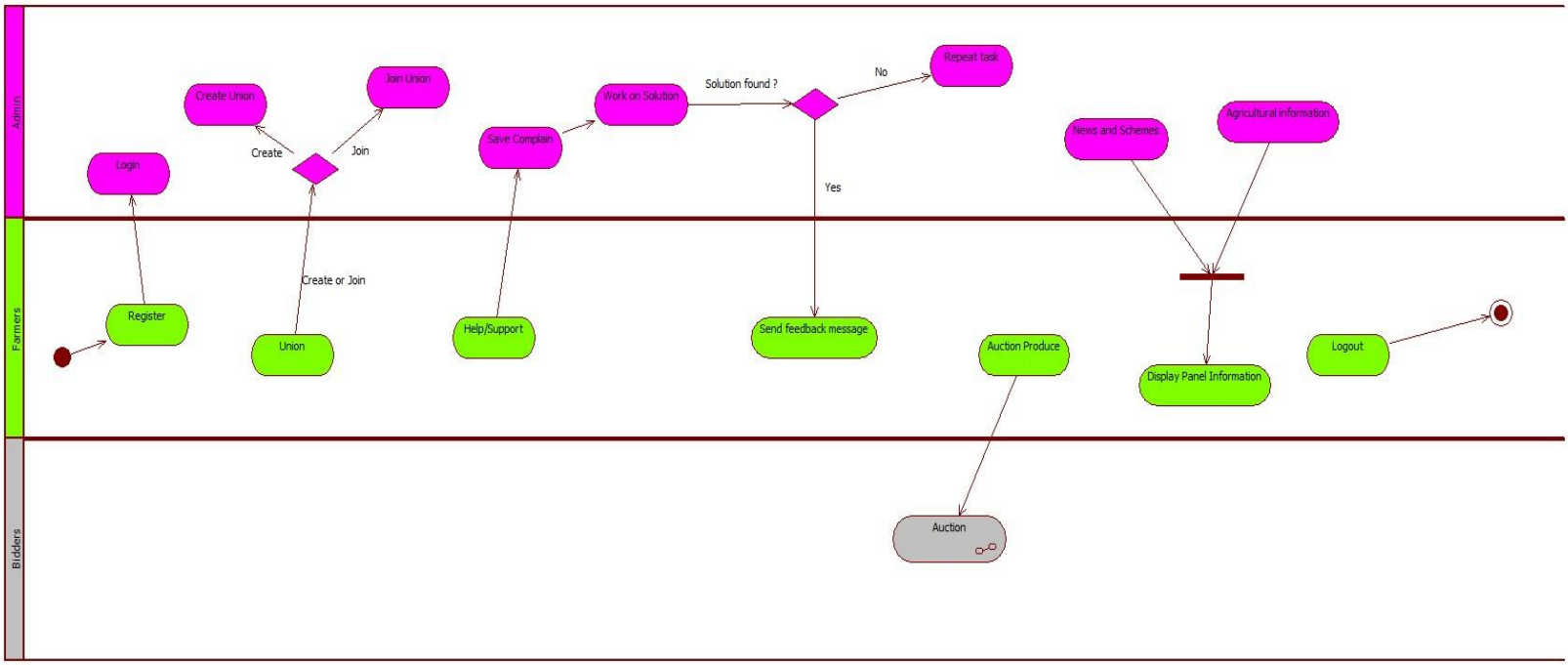
DATA FLOW DIAGRAM LEVEL 1:



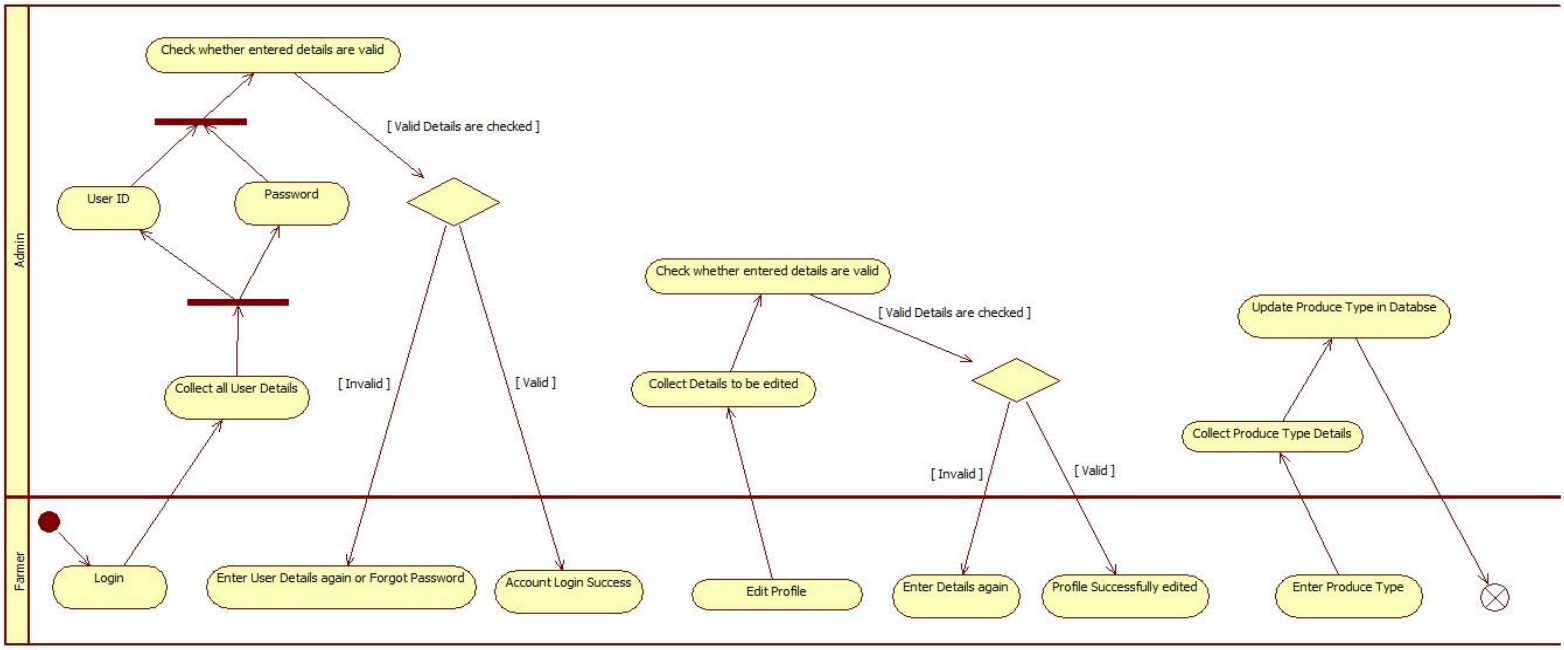
DATA FLOW DIAGRAM LEVEL 2:



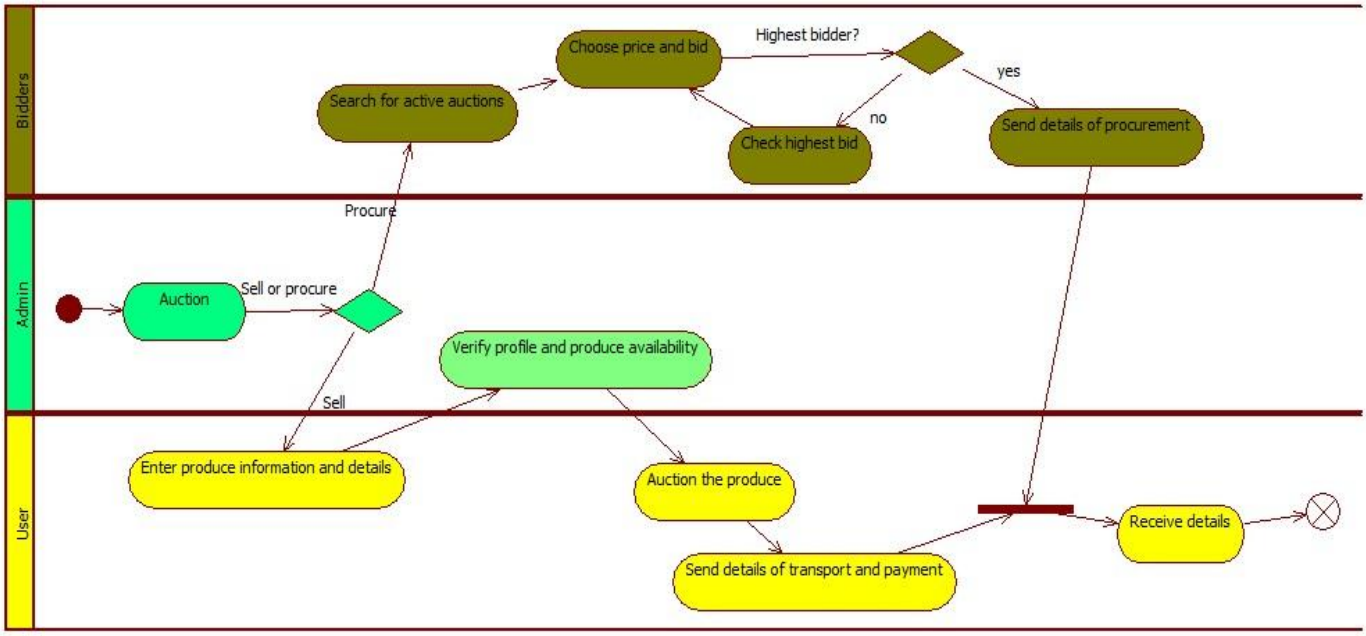
- ***ACTIVITY DIAGRAM:*** *The Activity Diagram below shows sequential and parallel activities involved in each functional requirement of this system.*



ACTIVITY DIAGRAM FOR LOGIN FUNCTIONALITY:

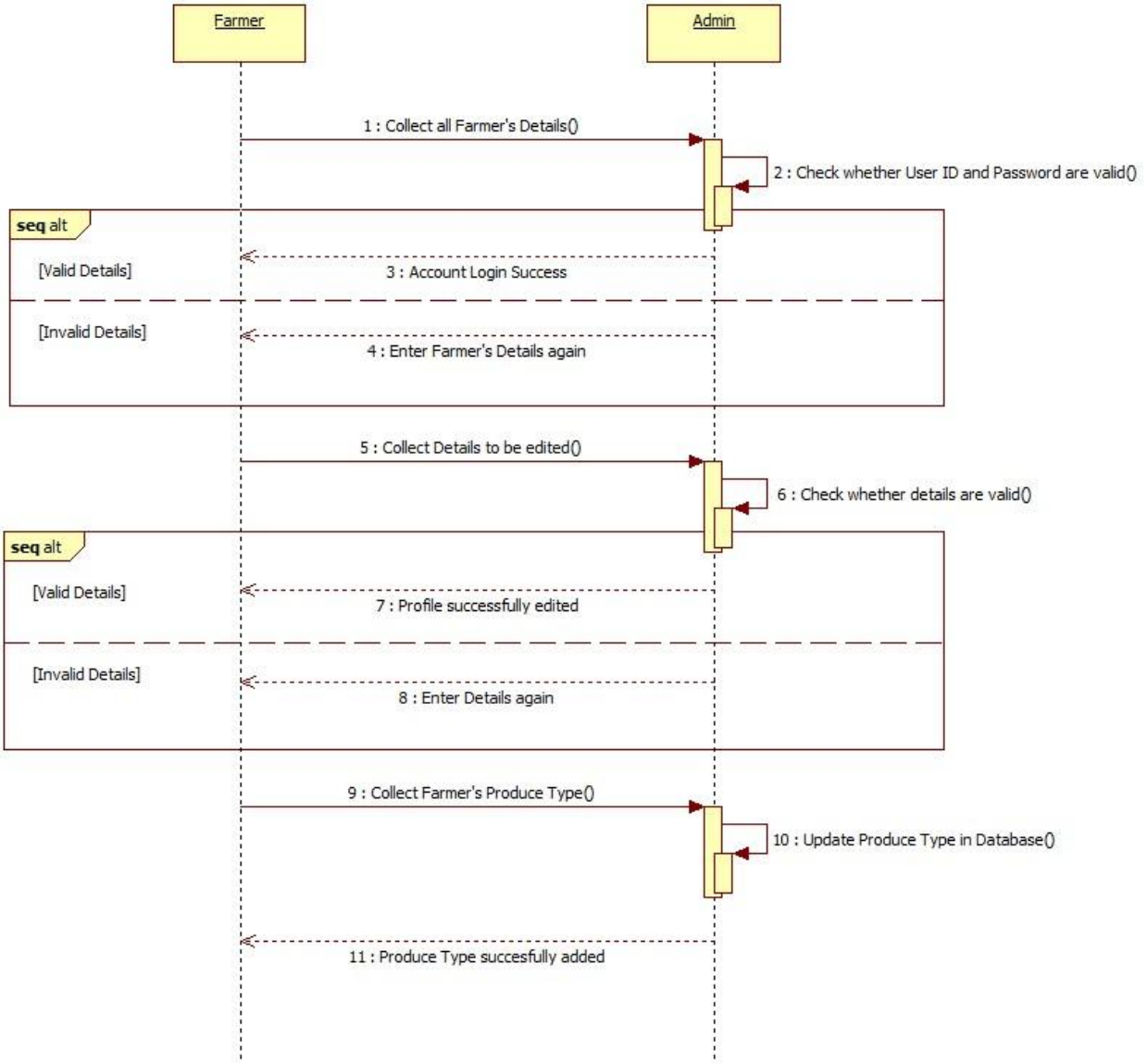


ACTIVITY DIAGRAM FOR AUCTION FUNCTIONALITY:

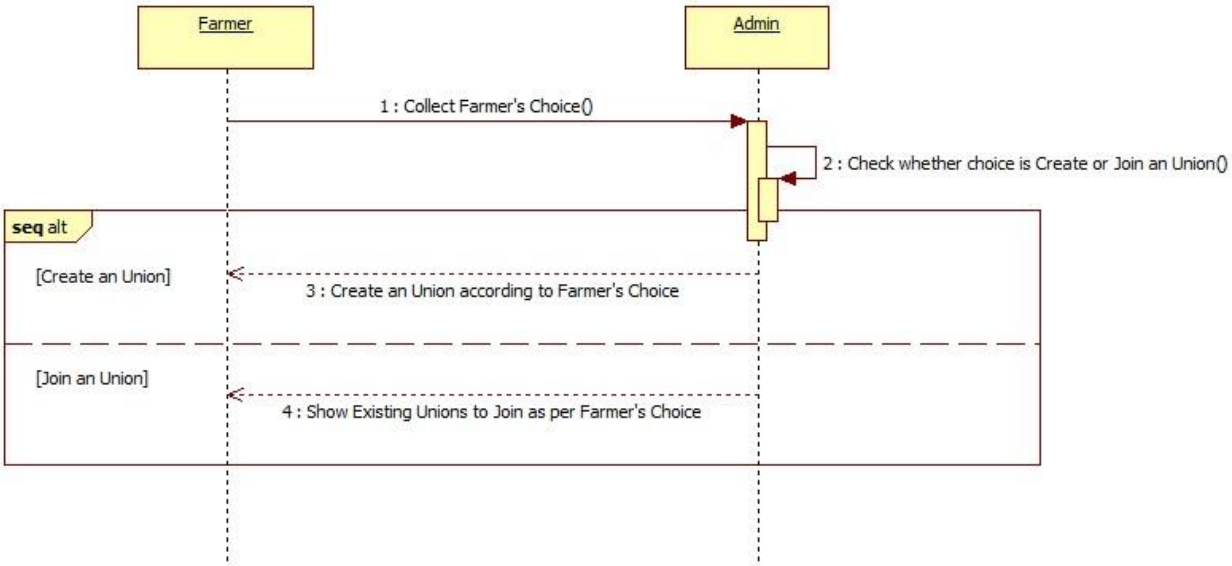


- ***SEQUENCE DIAGRAM:*** *The Sequence Diagram below shows how objects are involved in this system and the sequence of messages exchanged between objects needed to carry out the functionalities.*

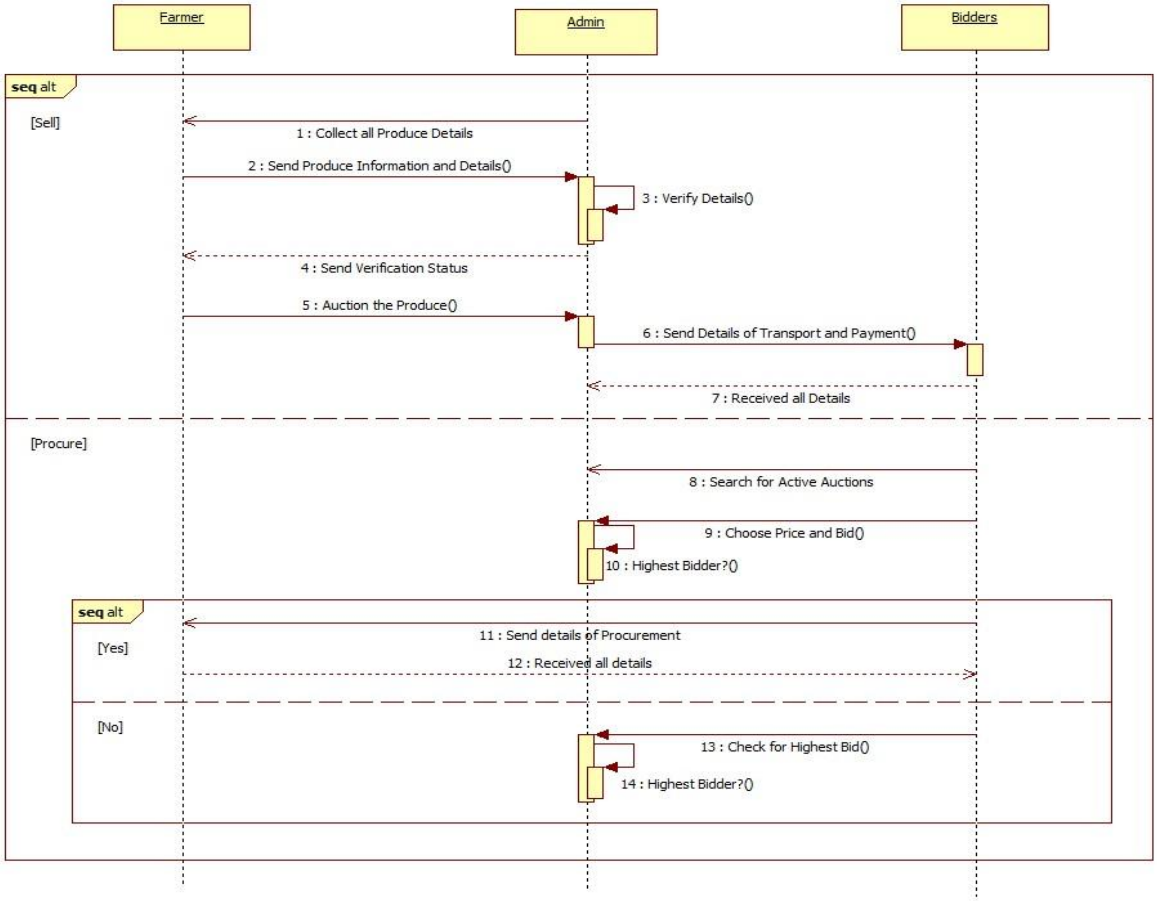
SEQUENCE DIAGRAM FOR REGISTER AND LOGIN FUNCTIONALITY:



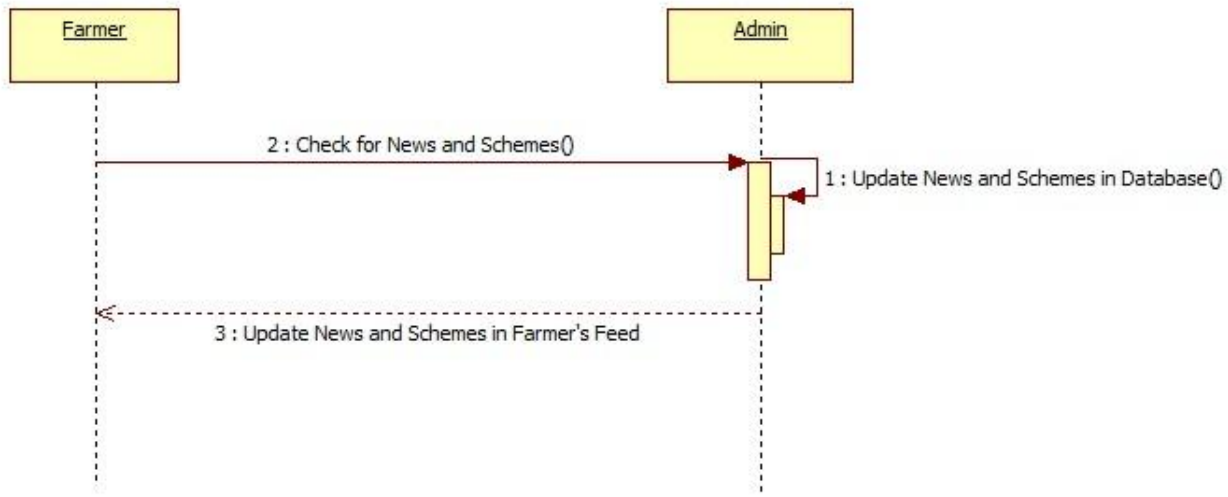
SEQUENCE DIAGRAM FOR UNION FUNCTIONALITY:



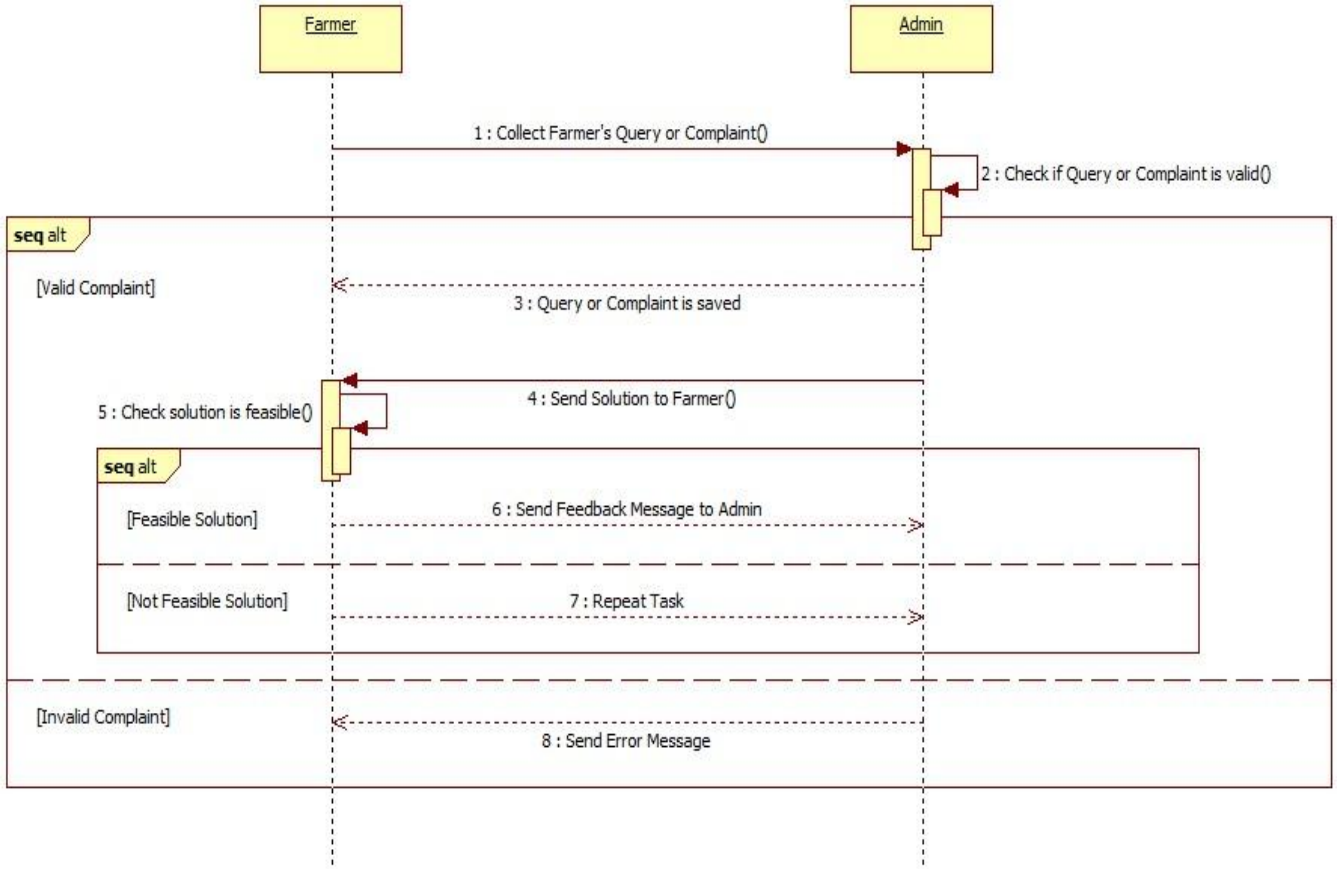
SEQUENCE DIAGRAM FOR AUCTION FUNCTIONALITY:



SEQUENCE DIAGRAM FOR NEWS AND SCHEMES FUNCTIONALITY:



SEQUENCE DIAGRAM FOR HELP AND SUPPORT FUNCTIONALITY:



- ***CLASS DIAGRAM:*** *The Class Diagram below shows the different classes of this system, their attributes, their operations and the relationships among them.*