Title of the Project

Seeds and Pesticides Decision with Chat Bot

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Submission Date: 23/09/2024

APPROVAL

This Project titled "Seeds and Pesticides Decision with Chat Bot", Submitted by **Arman Hosen**, ID No: 193-16-486 to the Department of Computing & Information System, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computing & Information System and approved as to its style and contents. The presentation has been held on 23-09-2024.

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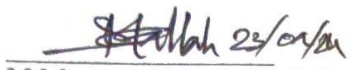

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DEDICATION

I hereby declare that; this project ("Seeds and Pesticides Decision with Chat Bot") has been done by me under supervision of Md. Faruk Hosen, Lecturer, department of Computing and Information System (CIS) of Daffodil International University. I am also declaring that this project or any part of there has never been submitted anywhere else for the award of any educational degree like, B.Sc., M.Sc., Diploma or other qualifications.

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Acknowledgement

Researching and finishing the project on "**Seeds and Pesticides Decision with Chat Bot**" was a delight for me. I am thankful to Allah for his favor in my education.

My profound appreciation goes out to my supervisor, Mr. Md. Faruk Hosen of Daffodil International University's CIS Department, for giving of his invaluable time, counsel, and inspiration during the course of my research and my academic career. I congratulate him and wish him well for his constant support, good judgment, relevant insights, and thorough comprehension of all the different aspects that were essential in making this project a success. His work has been crucial in making sure I understand what is required to do this job properly.

My sincere gratitude goes out to **Md. Faruk Hosen** a Lecturer in the Daffodil International University's CIS Department, as well as all of my lecturers for their unwavering support and tolerance during the completion of this thesis work.

Seeds and Pesticides Decision with Chat Bot

Executive Summary:

The project "Seeds and Pesticides Decision with Chat Bot" aims to assist farmers and agricultural workers in making informed decisions regarding the selection of seeds and the appropriate use of pesticides. The chatbot leverages artificial intelligence to analyze factors such as soil quality, crop type, weather conditions, and pest risks. Based on this analysis, it provides tailored recommendations that optimize crop yield while minimizing the environmental impact of pesticides.

By automating the decision-making process, the chatbot simplifies the complexities of modern agriculture, especially for those with limited access to expert advice. This system can be accessed through a user-friendly interface, allowing farmers to input relevant data and receive instant guidance. The recommendations are based on scientific data and best agricultural practices, ensuring both sustainability and efficiency.

The development of this chatbot has the potential to revolutionize farming by reducing guesswork, saving time, and improving productivity. The system is designed to be scalable and adaptable to various regions and crop types, making it a versatile tool for modern agriculture.

The project was conducted with the vision of contributing to the agricultural sector by promoting smart farming techniques and improving decision-making processes through technology.

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Chapter 1- Introduction

1.1 Description of the Project:

The "Seeds and Pesticides Decision with Chat Bot" project aims to provide farmers intelligent, in-the-moment assistance in selecting the best seeds and calculating the proper amount of pesticide to use in accordance with certain environmental circumstances. The chatbot uses artificial intelligence to provide suggestions that are specific to the user's agricultural requirements, with the goal of streamlining the decision-making process in agriculture.

Key Features:

1. Seed Selection:

The chatbot assists farmers in selecting the best seed kinds depending on factors including crop type, climate, and soil quality. It makes sure that crop development is optimum and yields are greater by analyzing these parameters.

2. Counseling with Agronomist:

The user may plan an appointment for agronomic counseling. The user solves and discusses his issue in this therapy session. Furthermore, agronomists recommend pesticides and seeds for user crops.

3. Pesticide Recommendations:

The chatbot makes suggestions for the types of pesticides to apply and the appropriate dosages based on the risks associated with pests and the kind of crops. Additionally, it offers safer and greener alternatives, lessening the negative consequences of chemical abuse or overuse.

4. Data Input and Analysis:

Specific information like soil pH, moisture content, past crop cycles, and insect infestations may be supplied by farmers. The chatbot makes precise, situation-specific recommendations for the use of seeds and pesticides based on this data.

5. Weather and Environmental Monitoring:

By integrating the system with real-time weather data, suggestions may be adjusted based on the present or predicted weather, therefore improving crop health and pesticide efficacy.

6. User-Friendly Interface:

With its online application or mobile application, the chatbot may be used by people with little to no technological experience. Many languages are supported by the interface to accommodate a diverse group of farmers.

Technology Stack:

Based on user input and use statistics, the chatbot constantly refines its suggestions via the use of AI and machine learning techniques. A cloud-based platform powers the system's backend, ensuring scalability and excellent performance, while an easy and responsive front end is included.

Impact:

The "Seeds and Pesticides Decision with Chat Bot" tackles typical agricultural issues include an over dependence on conventional farming practices, a lack of access to professional assistance, and environmental damage from excessive pesticide usage. This initiative intends to improve sustainable agricultural practices, lower expenses, and increase production by using smart technology into the farming process.

1.2 Document Context of the project:

- **Chapter 1: Introduction**: An overview of online applications is given in this section.
- **Chapter 2: Initial Study**: This part outlines the goals of my application, provides a variety of facts, pinpoints the issue, and explores possible fixes.
- **Chapter 3: Literature review**: The problems in the field are explained in this section, along with a suggested fix. This section also conducts a comparative study of the project.
- **Chapter 4: Methodology**: This chapter presents the project's methodology, including the chosen course of action and the underlying assumptions that led to its acceptance.
- **Chapter 5: Planning**: This chapter examines the project's viability from an operational, social, technological, and economic standpoint.
- **Chapter 6: Feasibility**: This section looks at the project's viability in all its forms.
- **Chapter 7: Foundation**: provides a high-level overview of the project's structure along with a detailed image.
- **Chapter 8: Exploration:** This section describes and illustrates the previous system using a variety of diagrams.
- **Chapter 9: Engineering**: A thorough description of the tasks completed and the engineering issues raised are given in this section.
- **Chapter 10: Deployment**: This section outlines the methods used, the tasks that are prioritized, and the processes that the project goes through in order.
- **Chapter 11: Testing**: The test cases used for the project are presented in this chapter.
- **Chapter 12: Implementation**: This outlines the approach and implementation procedure.
- **Chapter 13: Critical Appraisal and Evaluation**: The project's assessment is covered in this section.
- **Chapter 14: Conclusion**: This chapter gives a brief summary of the project and describes every step of the project's workflow."

Chapter 2- Initial Study

2.1 Project

proposal: 1. Initial Conception

A. Brief description of the project:

An AI-powered application called "Seeds and Pesticides Decision with Chat Bot" is intended to assist farmers in making well-informed choices about the use of pesticides and seed selection. Based on variables including crop qualities, weather patterns, and soil type, the chatbot offers tailored advice. The technology helps maximize agricultural productivity, lessen environmental impact, and encourage sustainable farming methods by evaluating real-time data and providing professional recommendations. Through the use of smart technology, the initiative seeks to improve production and streamline agricultural decision-making.

The agricultural decision-making system efficiently oversees the whole process in the farmer via the use of a web-based platform. AI testing procedures, appointment booking, and product detail manipulation (uploading, deleting, altering, and selling) are all examples of this. Users may engage with blogs on the website by leaving likes and comments, and administrators can respond to user feedback. In addition, the technology facilitates the management of monthly reports that display the company's financial success and helps physicians schedule appointments more easily. Logging in, taking AI exams, scheduling appointments, browsing and purchasing products, blogging, like material, and updating profiles are all benefits for farmers using the system.

B. Proof of a concept:

i. Prototype:

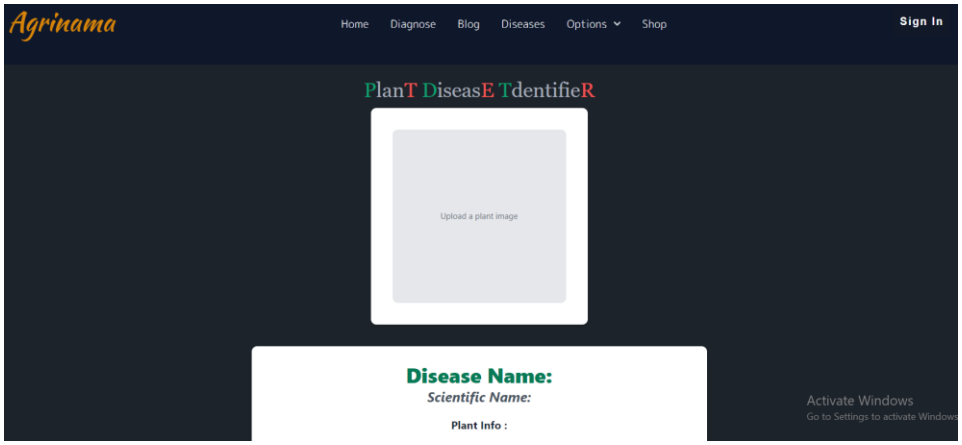

Fig 2.1: Prototype of Seeds and Pesticides Decision with Chatbot

ii. Initial research:

Market Viability:

The "Seeds and Pesticides Decision with Chat Bot" project has a great chance of succeeding in the market because of the rising need for intelligent farming solutions and the increased attention that sustainable farming is receiving on a worldwide scale. This project is feasible in the present and future agricultural markets due to a number of factors:

1. Growing Demand for Precision Agriculture:
With farmers looking to maximize their yields, save expenses, and maximize their resources, precision agriculture is becoming more and more important. In order to meet these objectives, our chatbot provides tailored guidance on seed selection and pesticide use depending on particular agricultural circumstances. The worldwide precision agricultural industry is predicted to increase dramatically in the future years, making this project particularly relevant and topical.

2. Environmental Sustainability and Regulation Compliance:
To safeguard the environment and public health, governments and organizations throughout the globe are implementing more stringent laws on the use of pesticides. The chatbot's capacity to prescribe environmentally-friendly pesticides and optimize their usage corresponds with these trends, giving farmers with a tool that helps them comply with laws and decrease chemical misuse. Because of this, a market group that prioritizes sustainability will find the solution appealing.

3. Large Addressable Market:
Given the number of small, medium, and big farmers worldwide, there is a sizable market for a solution that makes agricultural decision-making simpler. The chatbot's versatility and adaptability allow it to serve farmers in diverse places with varied crop varieties, soil types, and temperatures. The commercial potential of the chatbot is increased by its capacity to scale and localize it for various locations.

4. Ease of Adoption and Accessibility:
Because of its intuitive interface, farmers with little technological knowledge may readily adopt and use the chatbot. This solution's marketability is further enhanced and expanded by the increasing use of

smartphones and mobile internet in rural regions, particularly in developing nations. Its multilingualism also increases accessibility for a wider range of users.

5. Cost Efficiency and ROI for Farmers:
Through accurate recommendation-making, the chatbot assists farmers in cutting down on wasteful expenses related to improper seed selection or excessive pesticide usage. From a financial standpoint, this technology is very appealing because of the possible savings, enhanced agricultural yields, and optimal resource management that show a return on investment (ROI) for farmers.

6. Partnership Opportunities with Agricultural Tech Companies:
Partnerships between the initiative and producers of seeds, pesticides, and agricultural technology businesses, as well as government agencies engaged in agricultural policy, may be possible. The chatbot's market reach and value proposition might be improved by working with these organizations to include it into larger smart farming programs.

7. Future Expansion and Features:
The chatbot's utility and marketability may be further increased by adding future capabilities like market price forecasts, fertilizer suggestions, and crop disease detection. Long-term sustainability and relevance are ensured by the capacity to introduce new skills in response to market need.

Conclusion:
Due to its connection with current agricultural trends, rising environmental concerns, and the increasing need for precision farming technology, the "Seeds and Pesticides Decision with Chat Bot" project has significant commercial feasibility. This initiative has the potential to boost sustainability, save expenses, and raise production, making it a strong contender in the international agriculture market.

Feasibility Study

The "Seeds and Pesticides Decision with Chat Bot" project aims to create a chatbot that helps farmers make well-informed choices on the choice of seeds and application of pesticides. The technical, economic, legal, operational, and scheduling feasibility of the project are examined in order to determine its overall viability.

A. Operational Feasibility:

Operational viability assesses the project's accessibility to farmers and how effectively it can be incorporated into current farming practices.

- **User Adoption:** Because of its simplicity and ease of use, even farmers with little experience with technology may use the chatbot widely. Videos for training or instructive purposes may help users get acquainted with the system.
- **Scalability:** Because it may be developed to incorporate additional crops, areas, and even new capabilities like disease detection or market price projections, the project is very scalable. The cloud infrastructure assures that it can accommodate expanding user demand.

- **Support and Maintenance:**

The chatbot's continued functionality will depend on ongoing maintenance and upgrades. Both user comments and technical difficulties may be handled by a specialized support staff.

Conclusion:

The project is operationally viable due to its user-friendly design and scalable infrastructure, particularly with the right training and support in place.

B. Technical Feasibility:

The initiative makes use of well-established, widely accessible technology like cloud computing and artificial intelligence (AI). Thanks to these technologies, the chatbot can provide insightful suggestions based on data inputs like crop details, weather, and soil type.

- **AI Integration**
- **Data Sources and APIs**.
- **User Interface**

Conclusion:

The project is technically very viable since the necessary technological stack is easily attainable.

Hardware	Computer/Laptop Maximum 4 GB RAM 256 SDD WIFI Connection Needed
Software	Window 11 Microsoft office Visual Studio Node JS. MongoDB Compass Browser

Table 2.1: Seeds and Pesticides Decision with Chat Bot Equipment

C. Economic feasibility:

We evaluate the project's expenses in relation to its possible income and advantages in order to establish its economic viability.

- **Initial Development Costs:**

  Software development, AI training, integrating external data sources (APIs), testing, and deployment will all be part of the initial expenditures. By using cloud-based services and open-source platforms, these expenses may be reduced.

Serial Number	**Component**	**Price (BDT)**
1	Software	10000/=
2	Hardware (Maximum 1 Year)	25000/=
3	Web Hosting	5000/=
4	Other	10500/=
	Total	55000/=

Table 2.2: Economic Feasibility

- **Operational Costs:**

  Customer support, server upkeep, and API subscription fees are examples of ongoing operating expenditures. By collaborating with agricultural enterprises or providing farmers with subscription-based services, these expenses may be mitigated.

- **Revenue Potential:**

  The chatbot can generate revenue through various models, such as:

  - **Freemium model:** Basic services for free, with premium features available for a subscription fee.
  - **Partnerships with agricultural companies:** Seed and pesticide manufacturers could sponsor the service in exchange for product recommendations.
  - **Government or NGO Funding:** Since the project promotes sustainable agriculture, it could attract funding from government or non-governmental organizations.

Conclusion:

With multiple revenue streams and manageable costs, the project is economically feasible and has the potential for profitability.

D. Overall Feasibility Conclusion:

The "Seeds and Pesticides Decision with Chat Bot" project is highly feasible from a technical, economic, legal, operational, and scheduling perspective. The technology required is accessible, the costs are manageable with strong revenue potential, and the operational requirements are aligned with modern agricultural practices. With careful planning and adherence to regulations, this project is set for success.

Foundation

A. Defined goals and objectives of the project:

Goal: The primary goal of the "Seeds and Pesticides Decision with Chat Bot" project is to enhance agricultural productivity and sustainability by providing farmers with data-driven, real-time decision-making support. The chatbot aims to empower farmers by offering personalized recommendations on seed selection and pesticide usage, ultimately helping them improve crop yields, reduce resource wastage, and minimize environmental impact.

Objectives:

- Provide Accurate Seed Selection Advice.
- Offer Precise Pesticide Recommendations
- Promote Sustainable Farming Practices
- Reduce Farming Costs and Increase Efficiency
- Facilitate Easy Adoption and Scalability
- Interaction with agronomist and farmer
- Easy to shop agricultural medicine and equipment

Functional requirement:

- Image detection and identify diseases.
- Booking agronomist schedule.
- Baying agricultural medicine and equipment
- Reading agricultural vlog
- Share knowledge by posting and comments

Nonfunctional requirements:

- Verification and validation
- Dependability
- Adaptability
- Safety
- Adaptive
- System effectiveness
- Testability

2.4 Exploration and Engineering

A. Iterative development:

Provided the following list of iterative development:

- Manage report
- Manage product

Features wise development:

Prioritize the project's features first. It is required to set up the product, orders, blog, designer schedule, internship, report, packages, and so forth.

Deployment:

The successful deployment of the "Seeds and Pesticides Decision with Chat Bot" involves a systematic approach to ensure that the chatbot functions optimally and reaches the intended target users—farmers, agricultural workers, and stakeholders in rural and farming communities. The deployment process covers the technological setup, user training, and ongoing support to ensure the project's success.

2.2Background of the project:

Agriculture is the backbone of many economies around the world, and with the growing demand for food due to rising populations, optimizing agricultural practices has become essential. Making important choices about which seeds to plant and how much and what kind of pesticides to apply are common challenges faced by farmers. Nevertheless, these choices are difficult and need understanding of elements including insect risks, climatic conditions, and soil quality. Farmers often lack access to trustworthy information and professional assistance, which may result in inefficiencies, lower agricultural yields, and environmental harm from pesticide abuse or misuse. This is particularly true in developing nations. In order to overcome these obstacles, the "Seeds and Pesticides Decision with Chat Bot" project was created, which uses contemporary technology to streamline and enhance farmers' decision-making processes. This project is based on the integration of real-time agricultural data with artificial intelligence (AI). Through the provision of immediate, data-driven advice, the chatbot aims to bridge the knowledge gap and encourage sustainable farming practices among farmers.

2.3 Problem areas:

Data Availability and Quality:

- **Challenge:** Enough current, high-quality data on soil conditions, insect outbreaks, weather patterns, and crop health exist to provide precise recommendations about pesticides and seeds. Many remote regions may have limited or outdated access to this kind of information.
- **Impact:** Incomplete or incorrect data can lead to flawed recommendations, resulting in poor farming decisions and potential crop loss.
- **Solution:** Collaborating with local agricultural agencies and using satellite or IoT-based data sources could help improve data accuracy and availability.

Technological Literacy Among Farmers:

- **Challenge:** It's possible that many farmers—particularly those in remote or underdeveloped areas—lack the requisite knowledge or experience to use digital tools like chatbots.

- **Impact:** Low adoption rates brought on by the technology's complexity may compromise the project's efficacy as a whole.
- **Solution:** To guarantee higher acceptance, it is possible to close the digital literacy gap and provide training sessions, user-friendly interfaces, and support for local languages.

Internet Connectivity:

- **Challenge:** For AI-driven suggestions and real-time data processing, dependable internet connectivity is necessary. However, internet access is sometimes spotty or inconsistent in agricultural areas, particularly in developing nations.
- **Impact:** Farmers may not be able to access the chatbot when they need it most, limiting the chatbot's ability to provide timely advice.
- **Solution:** Providing offline capabilities or developing a lightweight version of the chatbot that can work with minimal connectivity could mitigate this issue.

Cost of Implementation:

- **Challenge:** Implementing the chatbot requires resources for cloud hosting, AI model development, and real-time data integration, which could be expensive.
- **Impact:** High costs might limit the scalability of the project or restrict access to certain regions or farmer groups.
- **Solution:** Seeking government or NGO partnerships and offering subsidized access to farmers can help reduce the financial burden and expand the project's reach.

The "Seeds and Pesticides Decision with Chat Bot" project is confronted with a number of obstacles, such as the accuracy of AI-driven suggestions, internet access, technical literacy, and data quality. The effective deployment and uptake of the chatbot among farmers will depend on addressing these issue areas via careful planning, working with local experts, and ongoing system improvement.

Overcoming these obstacles and guaranteeing long-term effect will also depend heavily on appropriate training, customization, and support.

2.4 Possible solution:

A multifaceted strategy is needed to address the issues raised by the "Seeds and Pesticides Decision with Chat Bot" project. This strategy includes leveraging collaborations, enhancing technology accessibility, guaranteeing data integrity, and promoting sustainability. The initiative may overcome its obstacles and ensure a successful deployment and uptake among farmers by putting these suggestions into practice. Long-term project success will depend on assistance, training, and continuous development. Finally, but just as importantly, funding digital literacy initiatives and providing user-friendly guides may provide users with the skills and information necessary to properly traverse the Seeds and Pesticides Decision with Chat Bot.

Chapter 3 – Literature Review

The literature review is an essential step in the system development process. It is a crucial instrument for pinpointing the exact target region. Finding comparable activities in the area during the development phase is made easier with the help of the literature study. As a result, this facilitates the process of determining which essential elements of the proposed system must be included.

3.1 Problem domain discussion based on papers that have been published:

- **Managing Costs:**

  For all types of enterprises, including agricultural services, accounting is essential. This means monitoring the costs associated with assignments, materials, advertising, and other things like monthly bills. Many agricultural services may find it difficult to control facility-related expenses. Ineffective workplace operations may be costly, time-consuming, and resource-intensive in the agricultural services sector.

- **Lack of Transparency:**

  By implementing these transparency-focused solutions, the "Seeds and Pesticides Decision with Chat Bot" can foster trust among users, helping farmers feel more confident in the system's recommendations. Clear communication about how decisions are made, where data comes from, and how feedback influences updates will ensure that the chatbot is perceived as reliable and trustworthy.

- **Schedule and Time Management:**

  As all parties involved in the "Seeds and Pesticides Decision with Chat Bot" solution systems have responsibilities, one of the most important aspects of your work is ensuring that you and your coworkers effectively manage your time. Many have always struggled with design in the field of mental health solution systems, which usually leads to lengthy processes.

Talk about how to solve problem using published papers as a basis:

A **discussion on the problem solutions** of the "Seeds and Pesticides Decision with Chat Bot" project, based on published articles and research, can focus on how the identified solutions address typical challenges in agricultural technology and AI-driven advisory systems.

3.2 Recommended approach:

A systematic, methodical approach is advised for the effective implementation and acceptance of the "Seeds and Pesticides Decision with Chat Bot," considering the recognized problem areas and possible remedies. In order to ensure long-term sustainability and efficacy, this strategy places a strong emphasis on workable solutions, user participation, and flexibility to local circumstances.
The "Seeds and Pesticides Decision with Chat Bot" project can guarantee effective deployment, get over trust-related and technical obstacles, and advance sustainable agricultural practices by using this multi-step process. The suggested tactics center on keeping the chatbot transparent and compliant with regulations while making it simple to use, accessible in areas with spotty internet, and responsive to local agricultural requirements. In addition to addressing immediate issues, these steps will promote long-term farmer adoption and system confidence.

Chapter 4 – Methodology

A project methodology helps us with our project analysis. To make the application better, consider its length and any possible problems. Verify that the user and the company understand each other. Systems should be developed using software.

There are several options for creating apps accessible all around the globe. The key is to understand which approach is most effective for a certain task. I'll begin by analyzing three distinct strategies and outlining the benefits and drawbacks of each to determine which is best for the job.

Waterfall Model: The waterfall model, one of the most well-known approaches in software development, requires tasks to be completed step-by-step within predetermined periods. Known for its simplicity, it's sometimes referred to as the "direct life cycle model." The waterfall model requires that each stage be completed before moving on to the next; it does not go back and review steps. This model makes the software development process easy to understand and utilize by providing a clear illustration of it. Despite its rigidity, the waterfall model is considered one of the most advantageous Software Development Life Cycle (SDLC) methodologies for software development.

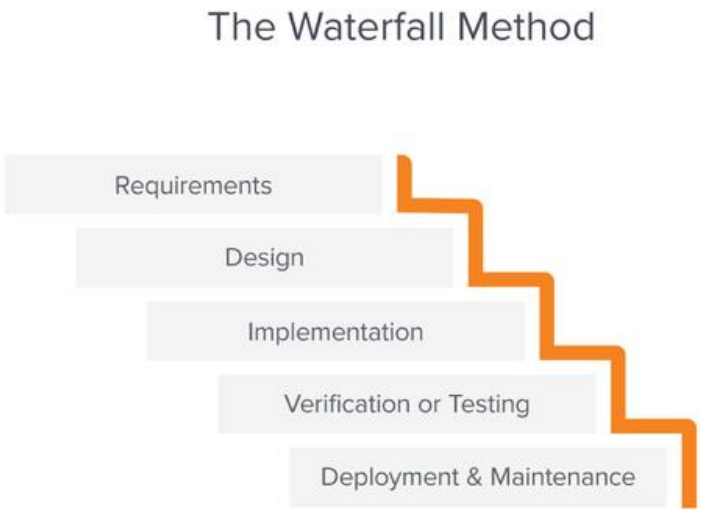

Fig 4.1: waterfall model development process

Advantages:

- Simple and Easy to Understand: The Classical Waterfall Model is really straightforward.
- Individual Processing: In the Classical Waterfall paradigm, each phase is handled independently.
- Appropriately Defined: Every step in the traditional waterfall paradigm has a precise definition.
- Well-defined Milestones: The milestones in the traditional Waterfall approach are extremely well-defined and understood.
- Appropriately Recorded: The procedures, activities, and outcomes are meticulously recorded.
- Promotes Positive Habits: The define-before-design and design-before-code principles are promoted by the classical waterfall model.
- Functioning: Smaller projects and projects with clearly defined requirements are a good fit for the classical waterfall model.

Disadvantages:

- No Feedback Path: Software evolves from one phase to the next in a manner akin to a cascade according to the traditional waterfall paradigm. It is predicated on the idea that developers never make mistakes at any stage. It does not, therefore, have an error correcting system.
- Change requests are difficult to satisfy since this paradigm is predicated on the idea that all client requirements can be accurately and fully specified at the outset of the project, but over time, the needs of the client change. It is challenging to comply with any requests for changes once the requirements definition stage is finished.
- No Phase Overlap: According to this approach, a new phase shouldn't begin until the preceding phase has been finished. However, this cannot be maintained in real-world enterprises. Some phases may overlap in order to save costs and boost efficiency.
- Limited Flexibility: The Waterfall Model is an inflexible and linear method of developing software, making it unsuitable for projects whose needs are ambiguous or subject to change. It is tough to go back and adjust a phase that has already been finished.

Agile Methodology:

Agile methodology is a risk-taking technique that works especially well for software development, where requests and actions are fulfilled automatically through cross-functional team collaboration and automated delivery. It was created in reaction to conventional technology methods such as the Waterfall strategy and is compliant with the Agile Manifesto. Updates are essential in the continuously changing software market. To remain competitive, engineers must constantly improve their components, making the waterfall model's simple methodology unsuitable for this fast-paced sector.

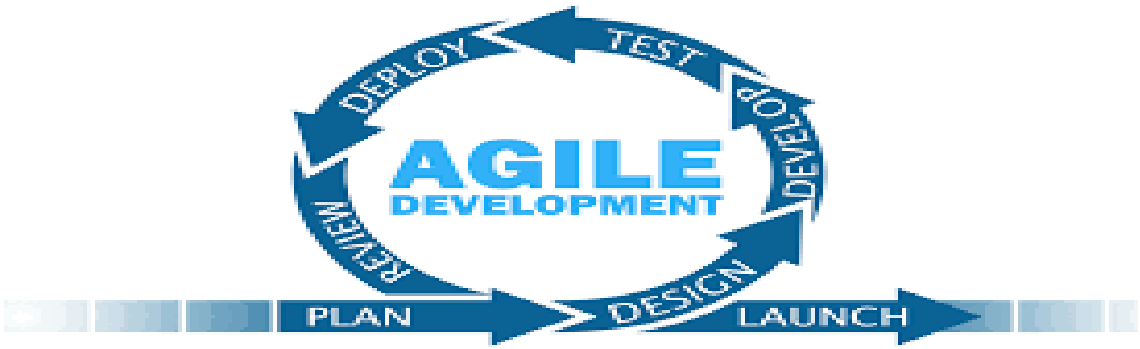

Fig 4.2: Agile Development Methodology

Advantages:

- Opportunity for Change
- Extensive Time Commitment from each one Involved
- Increase in Quality of the Software
- Quantifying the Real Scope can be a Challenge
- Progress Transparency
- Endless or the Boundless Work
- Engagement with Stakeholders
- Early Delivery through Sprint
- Potential Gap in the Documentation
- Predictable Schedule and Cost
- Resource Allocation can be a Challenge
- User-Focused Process

Disadvantages:

- Extensive Time Commitment from each one Involved
- Increase in Quality of the Software
- Quantifying the Real Scope can be a Challenge
- Progress Transparency
- Endless or the Boundless Work
- Engagement with Stakeholders
- Early Delivery through Sprint
- Potential Gap in the Documentation
- Predictable Schedule and Cost
- Resource Allocation can be a Challenge

Dynamic System Development Methodology (DSDM):

System design and administration are given priority in the intelligent approach to code development known as Dynamic System Development Methodology (DSDM). An 80% shift in humanitarian management is the driving force behind DSDM, and the application is normally submitted in 20% increments until it is fully completed (100%). In order to promote co-development, this iterative coding approach preserves 80% of the concepts pertaining to the necessary tasks for every cycle. After examining a large number of transactions to find any necessary adjustments, the remaining analysis is typically carried out.

Fig 4.3: DSDM Methodology Process

Advantages:

- Users are highly involved in the development of the system.
- In this model basic functionality is delivered quickly, with more functionality being delivered at frequent intervals.
- This method provides an easy access by developers to end-users.
- In this kind of development approach projects are delivered on time and within a specific
- budget.

Disadvantages:

- The first thing is DSDM is costly to implement.
- As it requires users and developers both to be trained to employ it effectively.
- III. It may not be suitable for small organizations or one-time projects.

It's difficult to follow a set strategy since I'm creating The Seeds and Pesticides Decision with Chat Bot as part of my own research project, which uses an internal management system. As the research is not fully defined or assembled at this time, I will first concentrate on gathering data, analyzing it, and setting priorities for the systems that need to be developed. Since I am the only developer working on the project—I don't have a team or development team—there isn't a certain approach that is flawlessly matched with the system. The development of this project benefits from using a hybrid technique, which incorporates aspects of waterfall and DSDM models. While DSDM is well suited for the continuous development process, waterfall is essential for gathering requirements.

4.2 Why to use:

By adhering to the system requirements, I am certain. Out of all the advertising options, the selected approach is the best appropriate for this work since it complies with the system specifications. Within this setting, the particular methodology for this approach is easily obtainable.

- It guarantees timely answers in the event that help is requested.
- The job is successfully finished within the allotted period.
- Effectively makes use of interactive capabilities.
- Suggested frameworks can be configured by the imagined system.

Pre-project:

Initial needs and solutions are worked on at this phase, with an emphasis on adhering to the section's mention of time, money, and risk concerns.

Feasibility study:

Making sure an investment makes sense for our business is a necessary step in determining if it's a smart decision. We do this by examining market information to see if the investment is sensible. Like a tool, feasibility aids in determining the viability of an idea. We want to confirm that it's a wise decision. The viability of the investment indicates its wisdom. We develop a variety of initiatives, such as those that are commercial or technology-related. We also consider the quantity and quality of the assignments we can do. It assists us in determining which initiatives are most advantageous to our business.

Requirements gathering:

The conditions for acting or not acting are gathered in this section. Claims are gathered using a variety of techniques, such as value recommendations, comments, interviews, and inquiries. There are a number of suggested programs that accept applications.

Requirements analysis and prioritization:

It's time to rank the needs when they've all been collected. Low-priority requests are attended to after high-priority ones. This step goes into great depth about the criteria.

Exploration and engineering:

These two procedures, which are often called the fundamentals, comprise the essential audit and review to assess the process. The project is delivered to a technology firm for further development. During the discovery stage, terms are added if the user wishes to change them.

Post-project:

Systems and documentation are given to the team at project completion. This section covers the benefits and features of the project.

4.4 Implementation plan:

Users will be able to access the system, which is almost ready for operation, once the project reaches its conclusion. If problems arise at this point, it could be necessary to go back to the growth stage in order to make further improvements. After resolving all issues, the system setup is confirmed to provide the best possible performance. The final deployment indicates that it is available and ready for stakeholders to utilize.

Chapter 5 – Planning

5.1 Project plan:

Planning well is essential to any activity. It entails determining the tasks that must be completed, creating plans, evaluating risk considerations, scheduling tasks, allocating funds, and setting up work structures. This all-inclusive method helps developers comprehend their requirements and carry them out successfully. The design is in perfect harmony with the ideas presented in this part. The project is divided into many smaller portions, and then each resource is carefully planned. The foundation and focal point of all decision-making in this field is this platform.

5.1.1 Work Breakdown Structure (WBS)

A **Work Breakdown Structure (WBS)** divides the project into manageable sections or tasks to ensure all aspects of development are covered. Here's the WBS for the "Seeds and Pesticides Decision with Chat Bot". The Work Breakdown Structure (WBS) for the "Seeds and Pesticides Decision with Chat Bot" project ensures a systematic approach, covering all aspects from planning and design to development, testing, and deployment. This structure ensures the project stays on track and all tasks are completed efficiently to meet the goals of improving farming practices through AI-driven recommendations.

5.1.2 Time Duration and Time Boxing:

By facilitating the timely delivery of orders within predetermined periods, the time-box strategy helps to keep projects on track. Choosing the right time period is essential to finishing the assignment. The project's time-box schedule is shown below:

Time box:

Timebox is a tool for estimating time, the priority list be prioritized us Moscow method

Task Name	Start Time	Duration	End-Time
1. Initial Study	2 Jan 2024	20	22 Jan 2024
1.1 Identify the Project All requirement	23 Jan 2024	3	26 Jan 2024
1.2 Justify the Project	26 Jan 2024	5	31 Jan 2024
1.3 Find out the solution	1 Feb 2024	10	11 Feb 2024
1.4 The Aims and Objectives	12 Feb 2024	1	13 Feb 2024
2. Requirement Gathering and Analysis			
2.1 Feasibility Study	12 Feb 2024	1	13 Feb 2024
2.2 Use Cases	14 Feb 2024	10	24 Feb 2024
2.3 Functional Requirement	1 Mar 2024	2	3 Mar 2024
2.4 Non Functional Requirement	4 Mar 2024	2	6 Mar 2024
2.4 System Architecture	7 Mar 2024	1	8 Mar 2024
2.5 ERD For (Database Management0	9 Mar 2024	1	10 Mar 2024
2.6 Initial Class Diagram	15 Mar 2024	1	16 Mar 2024
3. Design			
3.1 UI Design	17 Mar 2024	10	27 Mar 2024
3.2 Database design	28 Mar 2024	3	31 Mar 2024
3.3 Class Diagram	31 Mar 2024	2	31 Mar 2024
3.4 Behavioral Model	2 Apr 2024	2	4 Apr 2024

3.5 Collaboration Diagram	5 Apr 2024	6	11 Apr 2024
4. Implementation	20 Apr 2024	**20**	10 May 2024
4.1 Programming Language MERN	18 May 2024	3	21 May 2024
4.2 Project Implementation	22 May 2024	19	10 Jun 2024
5 Testing	10 June 2024	5	15 Jun 2024
6 Documentation	15 Jun 2024	10	25 Jun 2024

Table 5.1: Time Boxing

Task Name	Acting Role	Duration
Initial Study	Analyst	14
Feasibility Study	Analyst and developer	2
Foundation	Analyst and developer	2
Literature Review	Analyst	11
Methodology	Analyst	20
Planning	Analyst and Developer	20
Exploration	Analyst and Developer	11
Engineering	Developer	40
Testing	Developer and Tester	6
Development Phases	Developer and Tester	22
Implementation Phase	Developer	20
Lesson Learned	Analyst And developer And Tester	21
Critical Appraisal	Analyst	4
Conclusion	Analyst	1

Table 5.2: Time Duration

5.1.3 Gantt chart:

The Gantt chart functions as a graphical depiction of a work program timeline, offering a thorough summary of all tasks, together with their corresponding start and finish dates and durations. This tool helps stakeholders understand when certain activities are expected to take place by providing information about the timing and order of different project parts. The Gantt chart facilitates the efficient management of project timelines and helps to meet project objectives within designated timeframes by offering a logical and well-organized layout. The Gantt chart for the project is shown below for your reference.

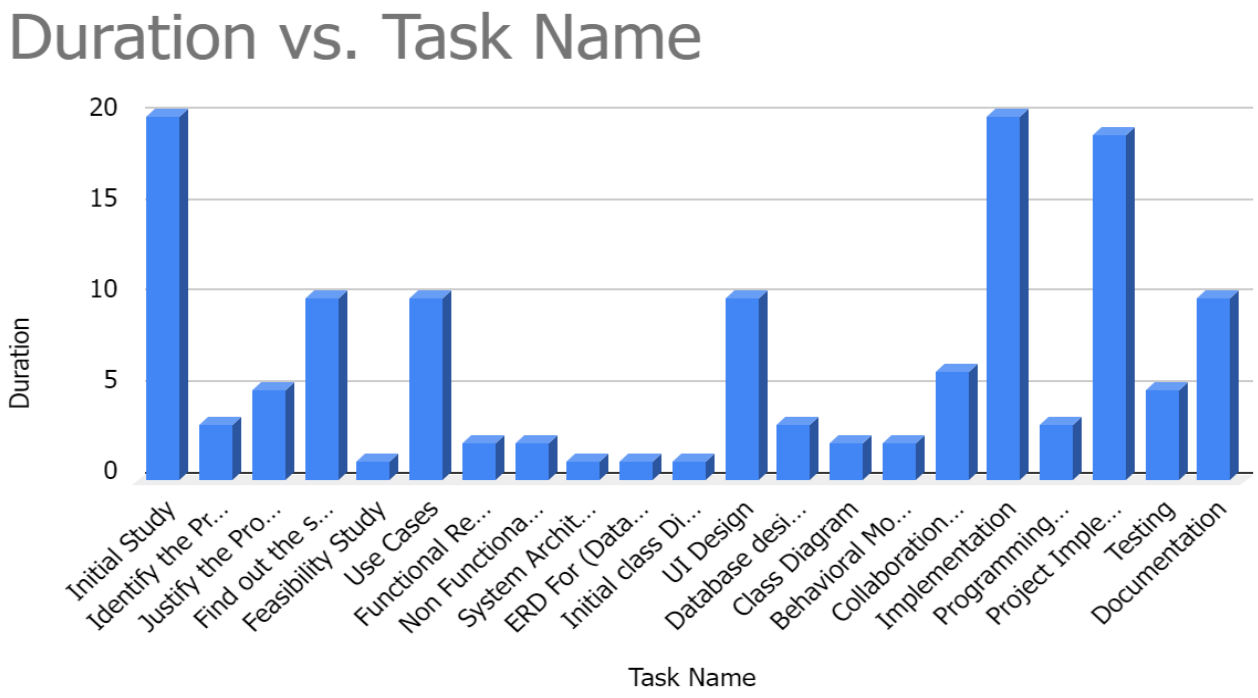

Fig 5.1: Gantt Chart

5.2.2 Required tests:

In the context of a software project like "Seeds and Pesticides Decision with Chat Bot," several types of tests are required to ensure the quality, functionality, and reliability of the system. These tests are crucial for identifying and fixing any issues before the final deployment of the chatbot. Here are the **required tests** for such a project:

Functional testing

Unit testing:

- **Purpose:** To verify that individual components (units) of the chatbot, such as functions, classes, or modules, work as expected.
- **Example:** Testing the chatbot's algorithm for recommending seeds and pesticides based on different user inputs.

Integration testing:

- **Purpose:** To ensure that different components of the chatbot work together as expected. It tests the integration of modules and identifies issues arising from their interaction.
- **Example:** Ensuring that the chatbot can access the database, retrieve relevant seed and pesticide information, and provide accurate responses based on user queries.

System testing:

- **Purpose:** To test the entire system as a whole to ensure it meets the specified requirements. This tests the complete chatbot system in an environment that simulates the actual deployment environment.
- **Example:** Testing how the chatbot handles end-to-end interactions, including user queries, database retrieval, and providing recommendations.

Acceptance testing:

- **Purpose:** To validate whether the chatbot meets the specified requirements and functions according to expectations. This is usually the final testing phase before deployment.
- **Example:** Testing to ensure that the chatbot correctly answers agricultural queries, provides accurate recommendations, and meets all functional requirements outlined in the project.

Non-functional

Security testing:

- **Purpose:** To identify vulnerabilities, security flaws, and potential risks in the chatbot system. This ensures that the system is secure, especially in terms of protecting sensitive user data.
- **Example:** Testing the chatbot’s handling of user data, ensuring it is protected from unauthorized access or potential data breaches.

Usability testing:

- **Purpose:** To assess how easily users (farmers) can navigate and use the chatbot. This ensures the

chatbot meets user expectations and is accessible, especially for those with low digital literacy.

- **Example:** Testing how easily a farmer can input a query and understand the chatbot's response. Evaluating the effectiveness of voice commands and the interface for non-tech-savvy users.

Reliability testing:

- **Purpose:** To ensure that new code changes or updates do not affect the existing functionality of the chatbot. This helps identify unintended side effects of changes.
- **Example:** After adding a new feature (e.g., additional language support), running tests to ensure the chatbot's core functionality

By conducting these various tests, the "Seeds and Pesticides Decision with Chat Bot" project can ensure the chatbot is functional, reliable, secure, and user-friendly, providing accurate and valuable recommendations to farmers. These tests will help minimize risks, enhance user satisfaction, and ensure the long-term success of the project.

Chapter 6-Feasibility

Feasibility study

Self-defense becomes the main focus of the feasibility study if it is workable, easily accessible, and compliant with the law. This helps determine if the project is viable. This section examines several feasibility study methodologies, such as specialized training programs, hands-on evaluations, and thorough feasibility analyses.

6.1 All possible type of feasibility:

6.1.1 Economic feasibility

Serial no	Sector	Cost (BDT)
1	Software	50,000/-
2	Hardware	25,000/-
3	Hosting	5,000/-
4	Others	6,500/-
Total Price		86500/-

Table 6.1: Economic Feasibility

Software cost:

Serial no	Name	License	Price (Yearly)	Total Price (BDT)
1	Microsoft office	1 year	10,000/-	10,000/-
2	Browser	Free	00/-	00/-
3	Operating system	1 year	25,000/-	20,000/-
4	Mongoose	Free	00/-	00/-
5	React (VS Code)	1 year	15,000/-	10,000/-
6	Figma	1 year	15,000/-	10,000/-
Total				**50,000/-**

Table 62: Software Cost

Hardware cost:

Serial no	Name	Quantity	Price	Total Price (BDT)
1	Hp laptop	1	90,000/-	90,000/-
2	Router	1	2,000/-	2,000/-
Total				**92,000**/-

Table 6.3: Hardware Costing

Hosting cost:

Serial no	Name	Package	Price (Yearly)	Total Price (BDT)
1	Hp laptop	1	90,000/-	90,000/-
2	Router	1	2,000/-	2,000/-
Total				**92,000**/-

Table 6.4: Hosting Cost

6.1.2 Technical feasibility:

The automated system is powered by JavaScript, which reduces the dangers of data loss and file corruption that are common in manual methods. Since the recent installation, automated processes have made duties much more accessible and doable. I have created an application that works with control panels and web browsers alike. These initiatives serve as the project's cornerstones by addressing the technological difficulties listed below.

Software:

- Microsoft office
- Operating system
- Firebase
- Mongoose
- Visual studio code

Hardware:

- Lenovo laptop (core i3
- Router

6.1.3 Operational feasibility:

Across many actively managed agriculture solution platforms. With administrative control, an admin user may monitor patients, upload product descriptions, remove, amend, and manage product descriptions as a whole. In addition to managing product orders and showcasing intern resumes, the administrator may set up blog areas for patient contact and exercise decision-making power for the agricultural solution systems organization. In order to improve the system's general functioning, my goal is to increase its operating capabilities.

- Easily image detection.
- Easily accessible of the system.
- Easily update post.
- easily booking agronomist schedule.

6.2 Cost Benefit Analysis

SL No	Sector of Expenditure	1 year	2 year	3 year	4 year	Total
1	Software cost	52,000/-	-	-	-	52,000/-
2	Hardware cost	76,000/-	-	-	-	76,000/-
3	Hosting	13,000/-	13,000/-	13,000/-	13,000/-	52,000/-
4	Office cots	22,000/-	22,000/-	22,000/-	22,000/-	88,000/-
5	Staff cost	32,000/-				128,000/-
6	Development cost	20,000/-	20,000/-	20,000/-	20,000/-	44,000/-
7	Other cost	6,000/-	6,000/-	6,000/-	6,000/-	80,000/-
	Total	221,000/-	93,000/-	93,000/-	93,000/-	5000,000/-

Table 6.5: Total cost analysis

SL No	Sector of expenditure	Year 1	Year 2	Year 3	Year 4	Total
1	Total Earning	180,000/-	200,000/-	210,000/-	230,000/-	820,000/-
2	Total Expenditure	221,000/-	93,000/-	93,000/-	93,000/-	500,000/-
	Total Revenue	-41,000/-	107,000/-	117,000/-	137,000/-	320,000/-

Table 6.6: Total Revenue Analysis

Chapter 7-Foundation

7.1 Overall Requirement List

Requirements in the field of software engineering are often divided into two categories: functional and non-functional. A set of comprehensive specs covering these many needs are provided below.

7.1.1 List of functional requirements:

- **AI Service:** User can multiple AI testing solution from the application.
- **Booking schedule:** The user may choose their planned appointment time with ease. And converse online with an agronomic.
- **Product publish:** Seller can easily publish his product in the shop.
- **Shop**: It's easy for users to choose things, put them in their carts, and easily confirm purchases. In order to monitor and show order statuses and discern between pending and finished orders, the administrative function supervises the order processing.
- **Posting**: By using this platform to create, update, and manage corporate data, the administrator may supervise and participate in blogs. The administrator may also participate in conversations by leaving comments on blogs. In contrast, patients may conveniently browse answers, like blogs, and leave comments. Users may also upload photos and PDFs, among other file types.

7.1.2 List of nonfunctional requirements:

- **Validation/ verification:**

  A strong validation and verification procedure is used on the website. Clients are asked to provide their data, which is then put through validation processes to make sure it is true and accurate.
- **Security:**

  The website prioritizes security in order to provide users a reliable online experience. Any website must prioritize security in order to provide users a safe and secure experience.

- **Responsive:**

The responsiveness of a website is crucial. Without it, users could run into a number of problems. Any device, including computers, mobile phones, and other devices, may easily view a responsive website.

- **Reliability:**

Accidental keystrokes might cause unexpected problems for the system. On the other hand, a system's ability to provide continuous services every day of the week is what determines its dependability. As such, guaranteeing excellent dependability is the main emphasis of our system's assessment.

- **Flexibility:**

It must be flexible enough to allow users to engage with it without difficulty. Moreover, every piece of data in the system has to be displayed in a thorough and complete way.

- **Testability:**

It is essential that the proposed system be made testable so that all of its properties can be readily verified. This guarantees smooth system interaction for designers, administrators, and users.

7.2 What Technology to be implemented:

Platform performance is enhanced by a number of enhancements during this time of heavy demand. A number of goals have been addressed by these improvements.

Client/ server application:

Within an organization or group, these apps play a critical role in enabling standardized and coordinated information flow. Any firm may benefit greatly from the integration of client or server apps, which is why it has been chosen for implementation. Furthermore, users may easily access them on many platforms at once, which increases their adaptability and accessibility. This program maintains low security concerns while operating at a fast speed. The following client/server applications are offered:

- Installed this in user computer.
- Not recommended for a big user base.
- There is a high expense.
- Robust and durable.

Web application: Web apps use a web application framework and run on personal computers. It takes just a few seconds to access and use the program on different devices.

Important characteristics:

- The program runs on its own without requiring any other software to carry out fundamental duties.
- Functions quickly without requiring the user to limit its operation.
- The program may be accessed via a drive URL.

7.3 Recommendations and Justifications:

To find the best solution for the suggested system, we have carefully looked at all of the applications in the agriculture solution system and their associated duties. We guarantee the web application's interoperability with our system by selecting a web server. This has a number of benefits, including cost-effectiveness, accessibility from any place with an internet connection, removal of the need for installation on certain devices, and quick and easy upgrades. Thus, it is evident that the best option for integrating with our recommended system is a web server application.

Chapter 8-Exploration

8.1 Old Full System Use Case:

This use case provides a detailed knowledge of user interactions and provides in-depth insights into the website's operations, serving as a comprehensive and illustrative portrayal of the whole system. It contributes to the improvement of user experience and system efficiency by providing insightful information on user activities and functionalities. The several use cases of the prior system are carefully outlined here, along with a thorough study of its operational dynamics and functional needs.

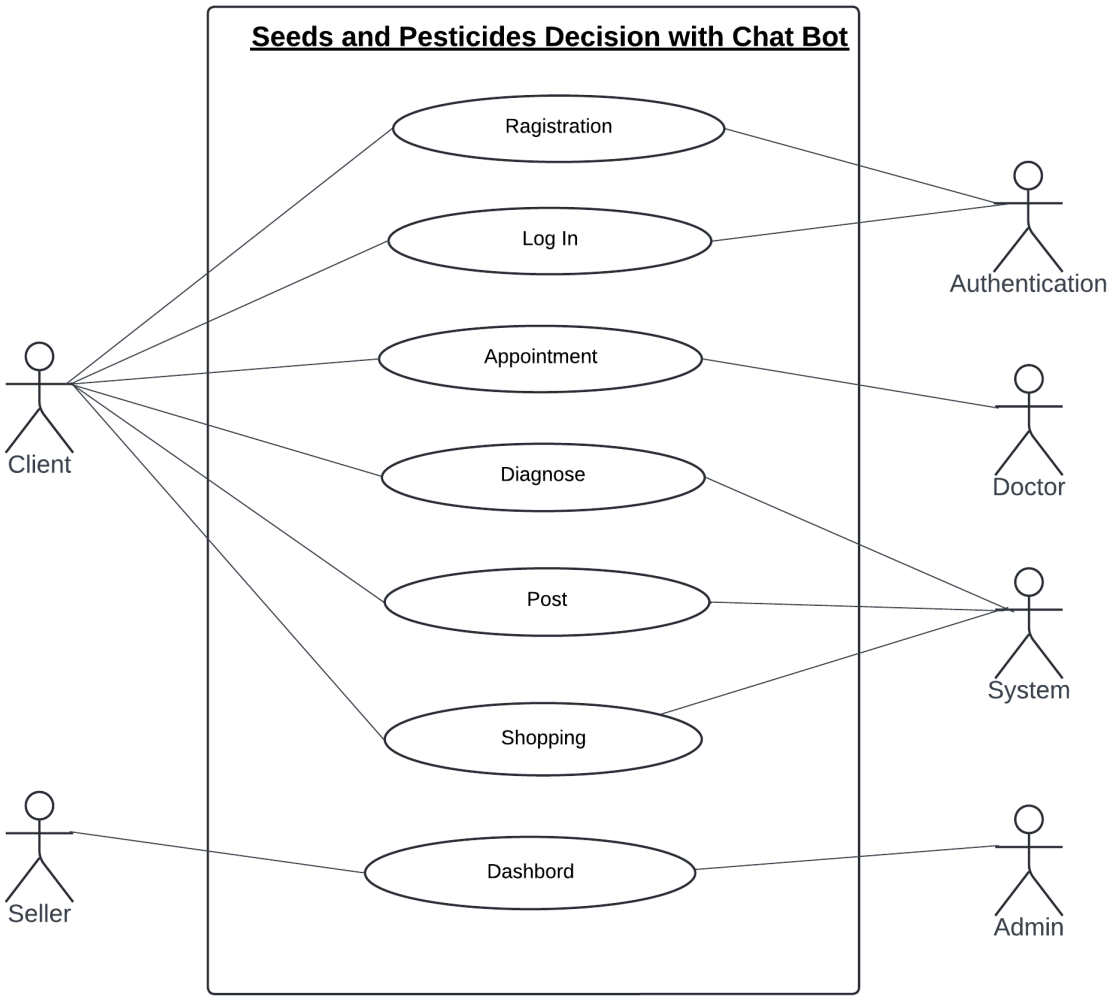

Fig 8.1: This is the project old system use case diagram

8.2 New system full activity diagram:

This diagram is essential for outlining system operations, recording performance information, and showing how one system transitions to another. This particular program sets itself apart from other systems. The workflow is represented by the activities diagram. The activity diagram from the prior system is shown below:

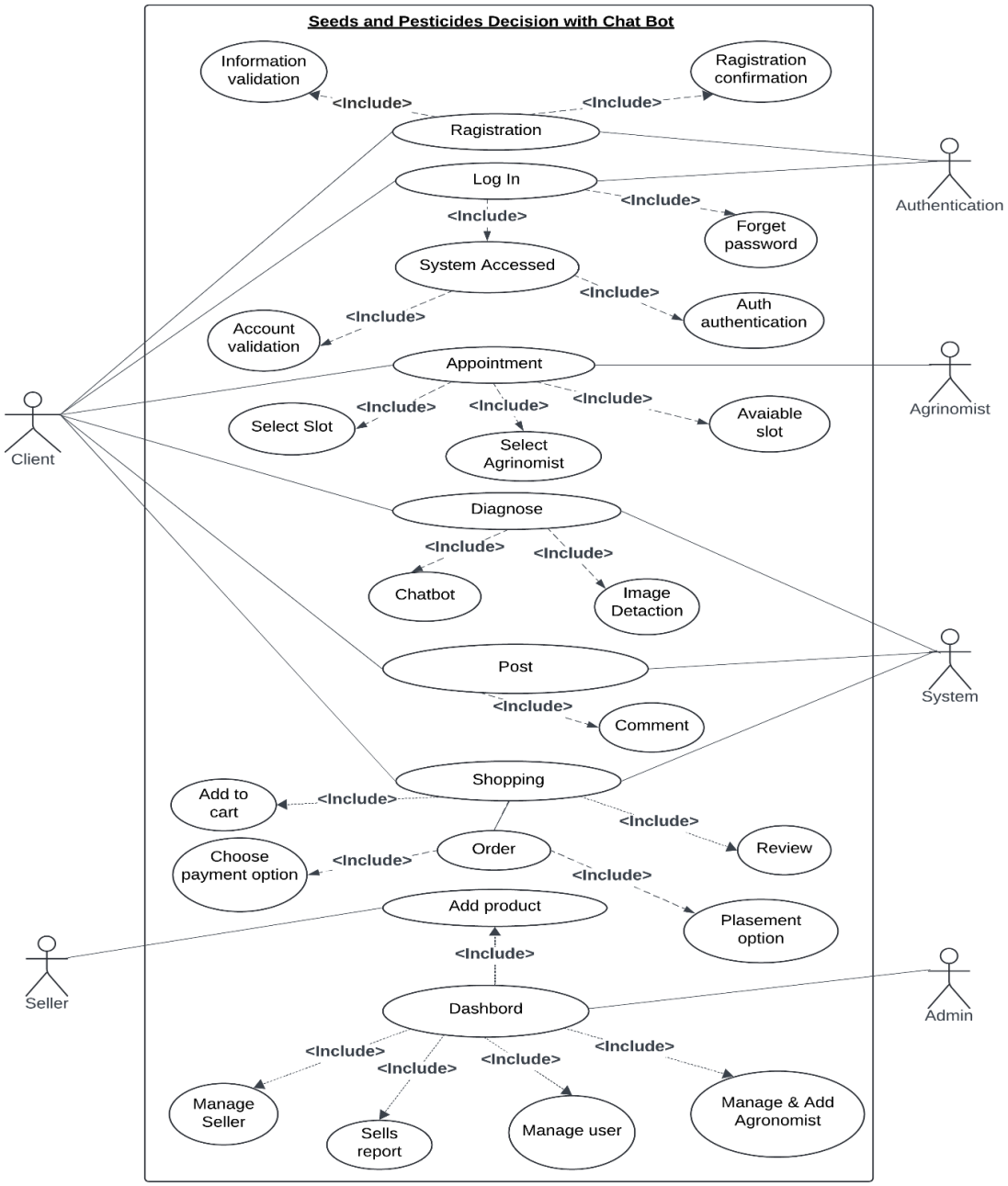

Fig 8.2: Use Case Diagram for New System

8.2 New system full activity diagram:

Activity diagrams are an excellent method for arranging system operations. Additionally, it captures the performance graphs of various systems and shows how one system migrates to another. There is no information about this particular usage in other records. The activity diagram acts as visual labor for the system. The antiquated system activity diagram is shown below:

Admin activity diagram:

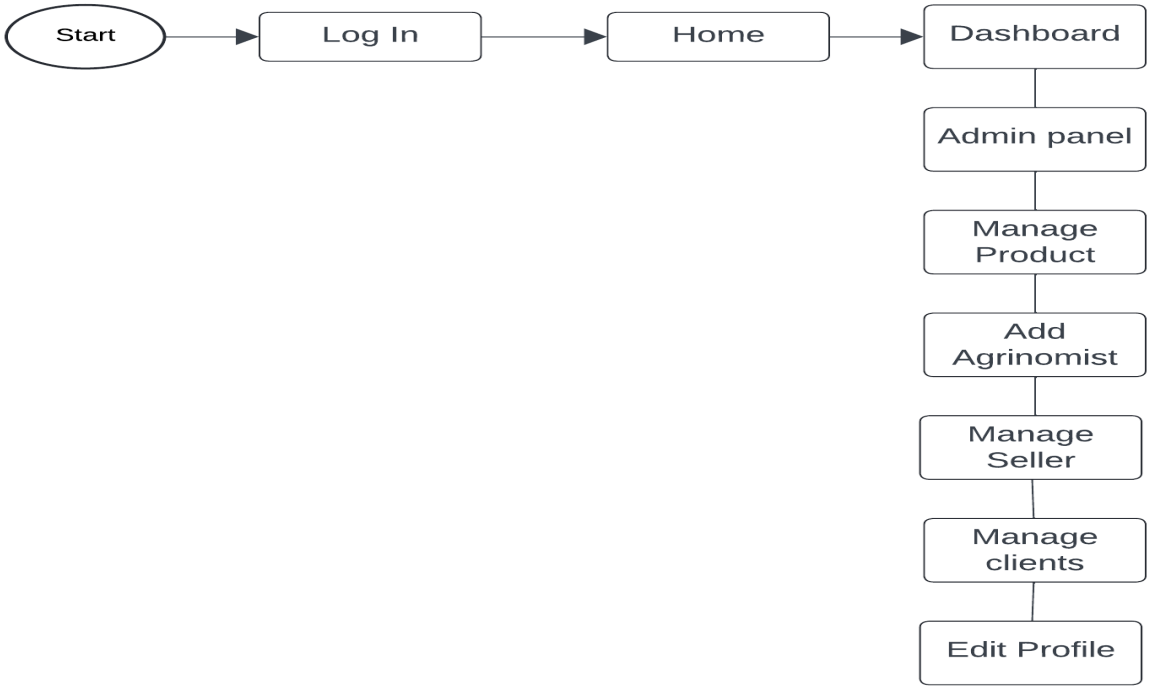

Fig 8.3: Admin Activity Diagram

Client activity diagram:

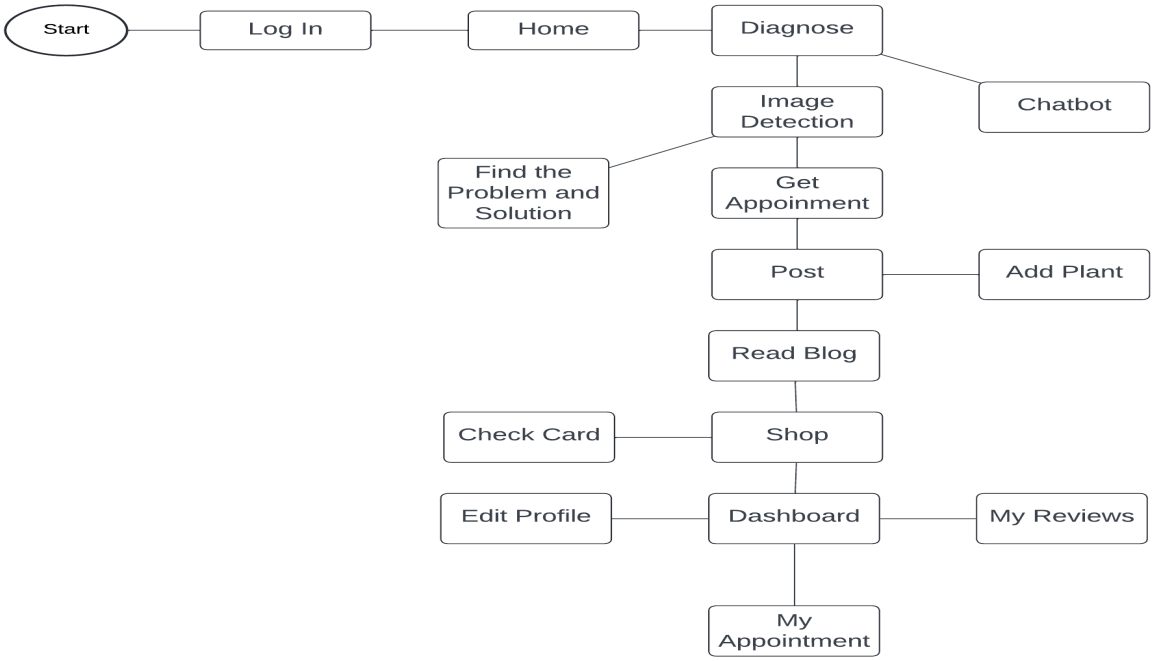

Fig 8.4: Client Activity Diagram

8.3 Prioritized Requirement List (PRL):

Moscow:

The **Moscow Method** (Must have, should have, could have, won't have) is a prioritization technique used to help focus on delivering the most critical functionalities first, while identifying features that can be delayed or omitted if necessary. Here's a Moscow analysis for your project:s

Prioritized Requirement

SL NO	**Moscow**	**Requirement**
1	Must have	• Accurate Seed and Pesticide Recommendations • User Input Interface • Database Integration • Mobile and Web Platform Compatibility • Security and Data Privacy Compliance
2	Should have	• Multilingual Support • User Profiles • Integration with Local Agricultural Policies
3	Could have	• In-App Educational Resources • Social Media Sharing
4	Won't have	• Financial Services Integration • Advanced AI Based Predictive Analysis

Table 8.1: Prioritization Table

8.4 Prototype of new system:

Prior to exploring the benefits, it is crucial to clarify the meaning of prototype. Prototypes are robust designs that come before final development designs. It does this by displaying the upcoming website's visual appeal as well as its design, organization, and connection with the larger website framework. The goal of prototyping is to focus on essential design components in order to accelerate the creation of websites. The new system's prototype is shown below:

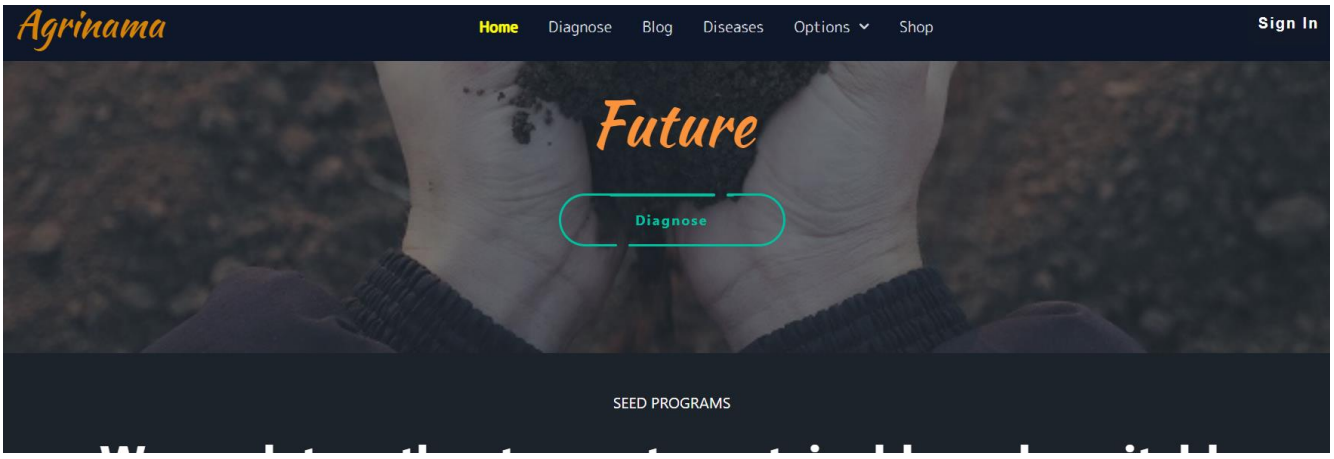

Fig 8.5: Prototype of home page

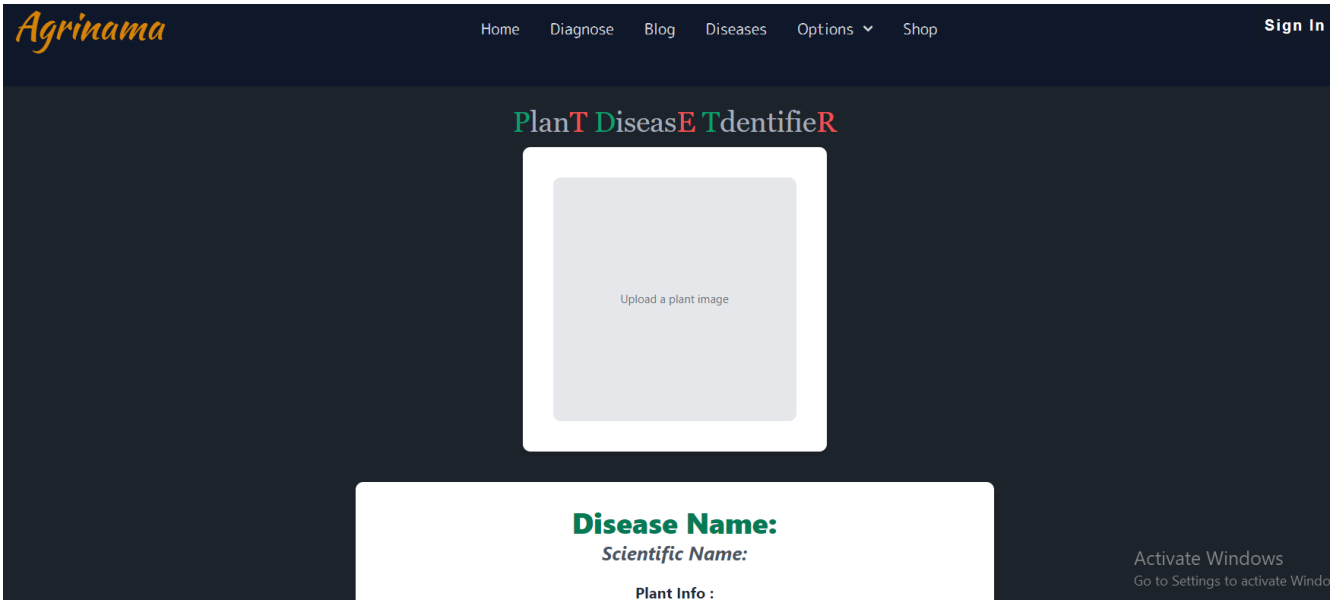

Fig 8.6: Prototype of image detection

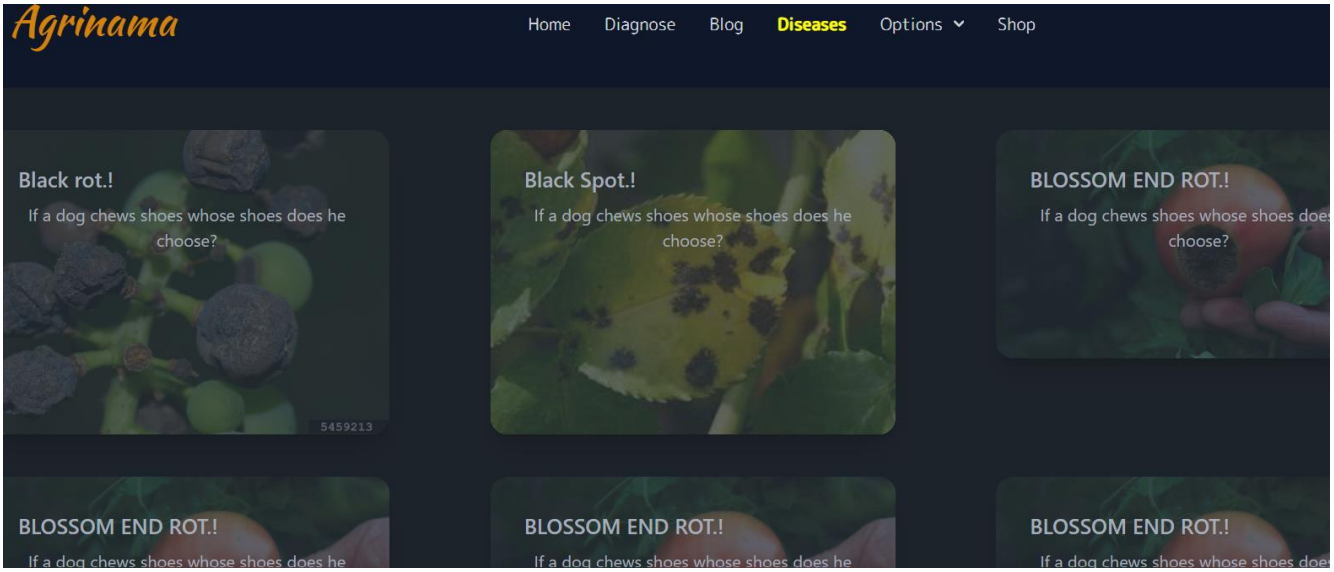

Fig 8.7: Prototype of diseases

Fig 8.8: Prototype of blog

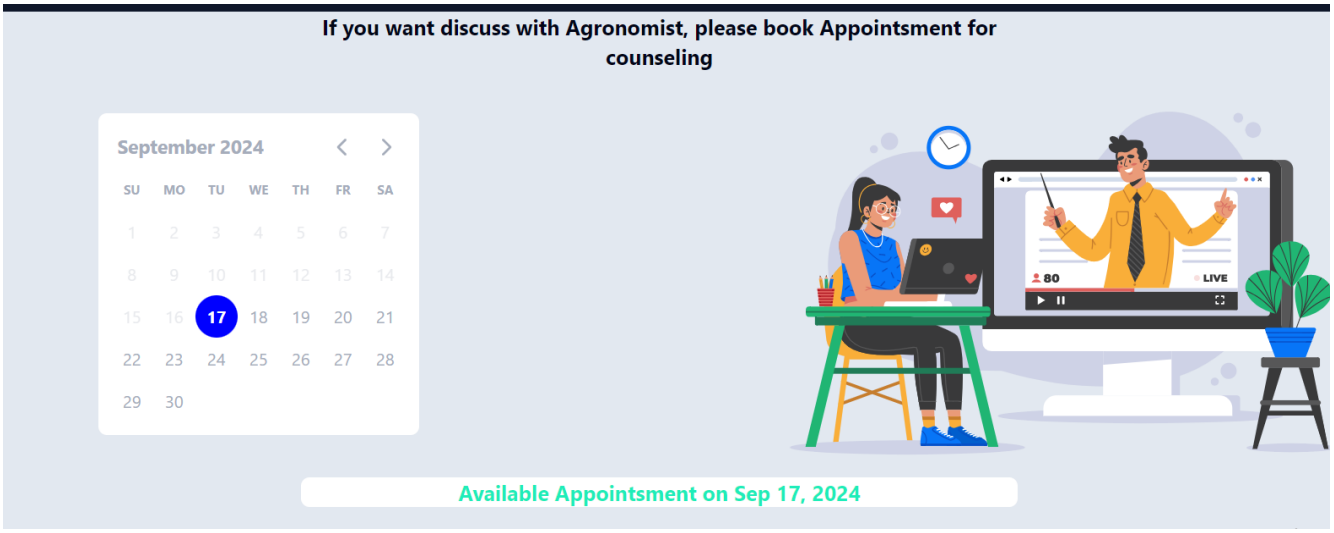

Fig 8.9: Prototype of appointment

Chapter 9-Engineering

9.1 New System Modules:

I create a versatile application that satisfies a range of needs. Permit me to analyze its main features. These essential elements set the system apart and allow it to do tasks that no other system can match.

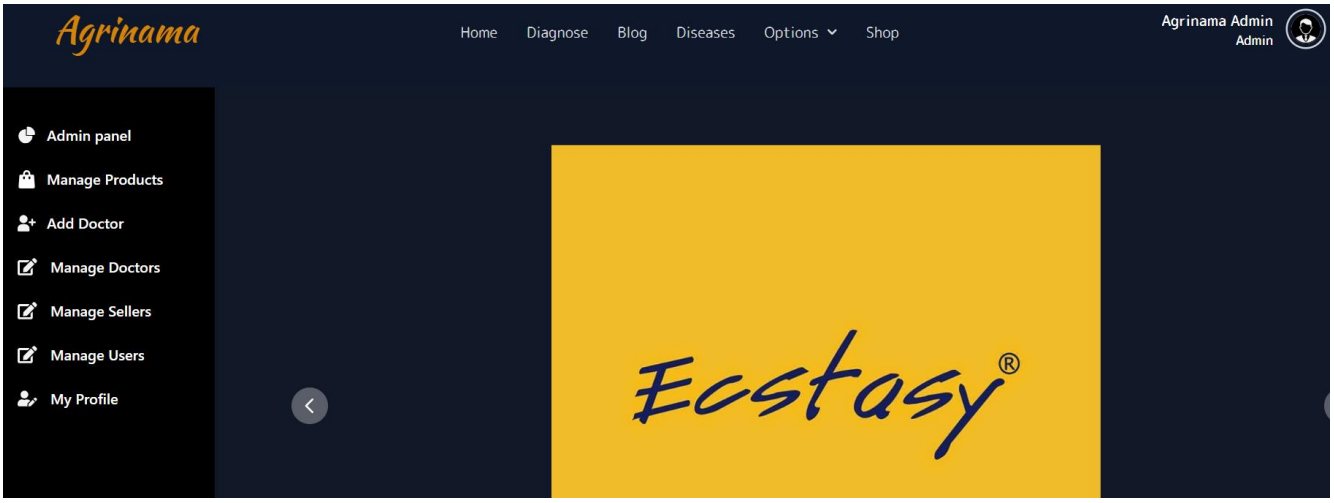

Fig 9.1: Prototype of New admin System

9.2 New system Use case:

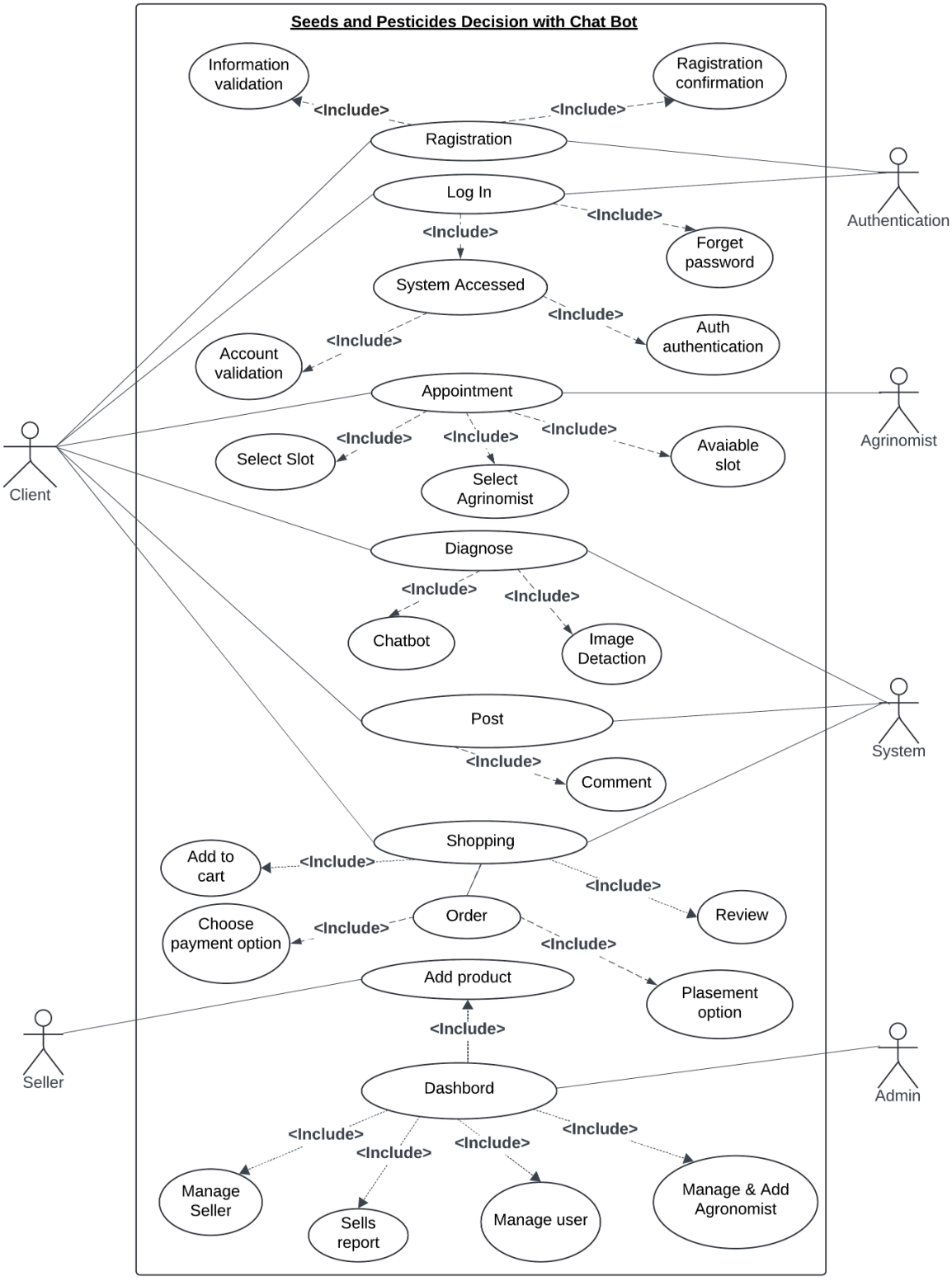

Fig 9.2: New System Use Case

9.3 ERD Diagram:

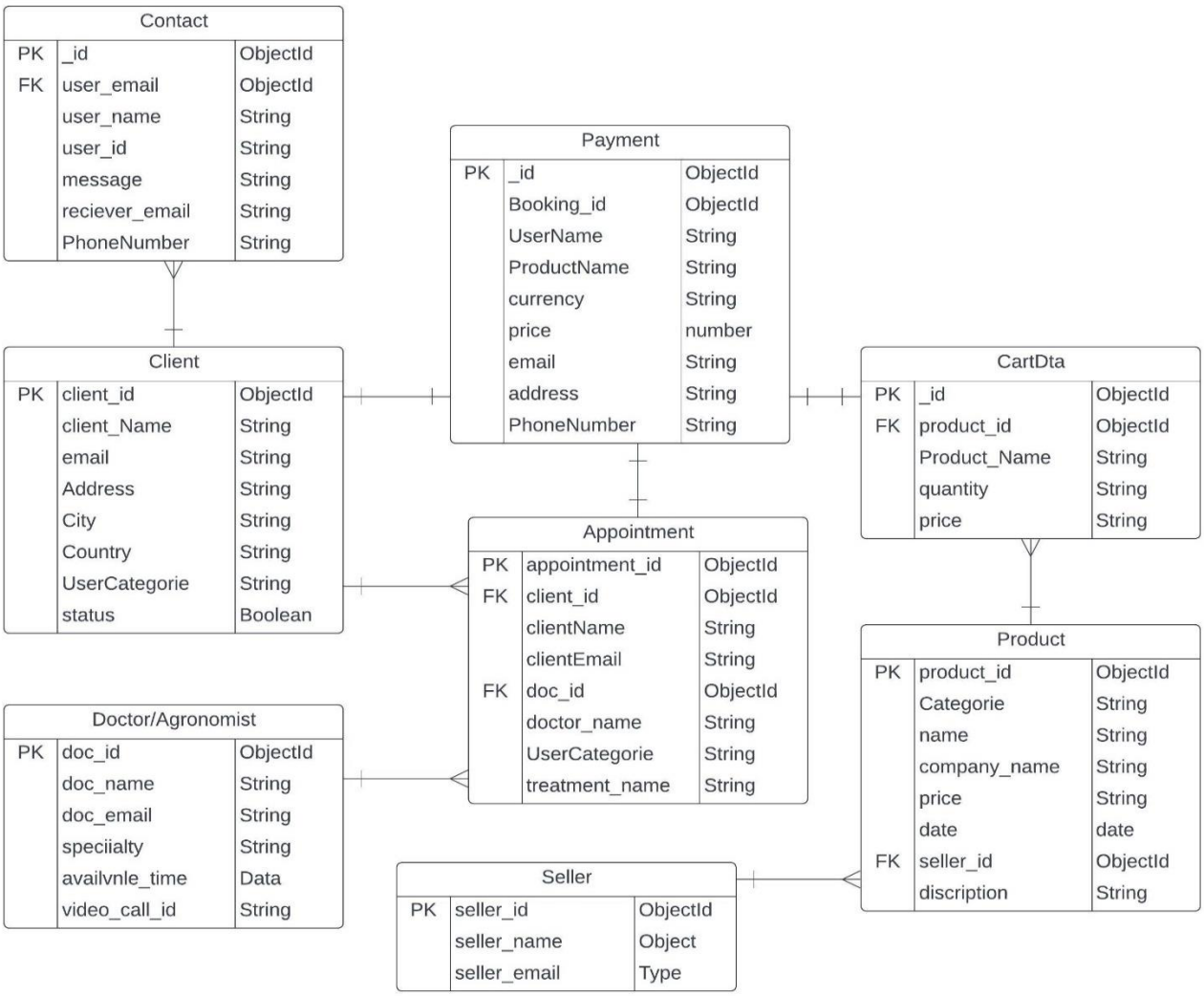

Fig 9.3: ERD Diagram

9.4 System Interface Design / Prototype:

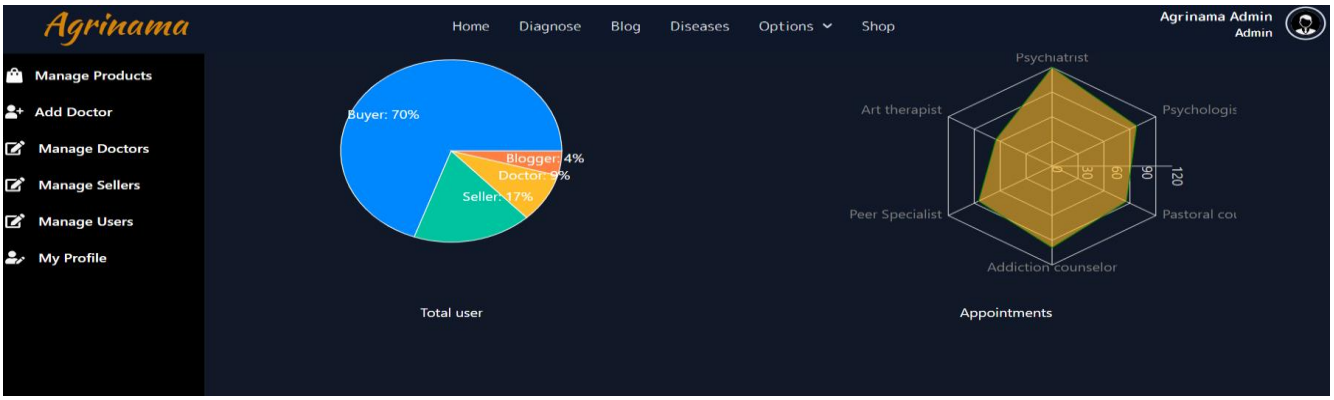

Fig 9.4: System Interface Dashboard

Fig 9.5: System Interface Dashboard

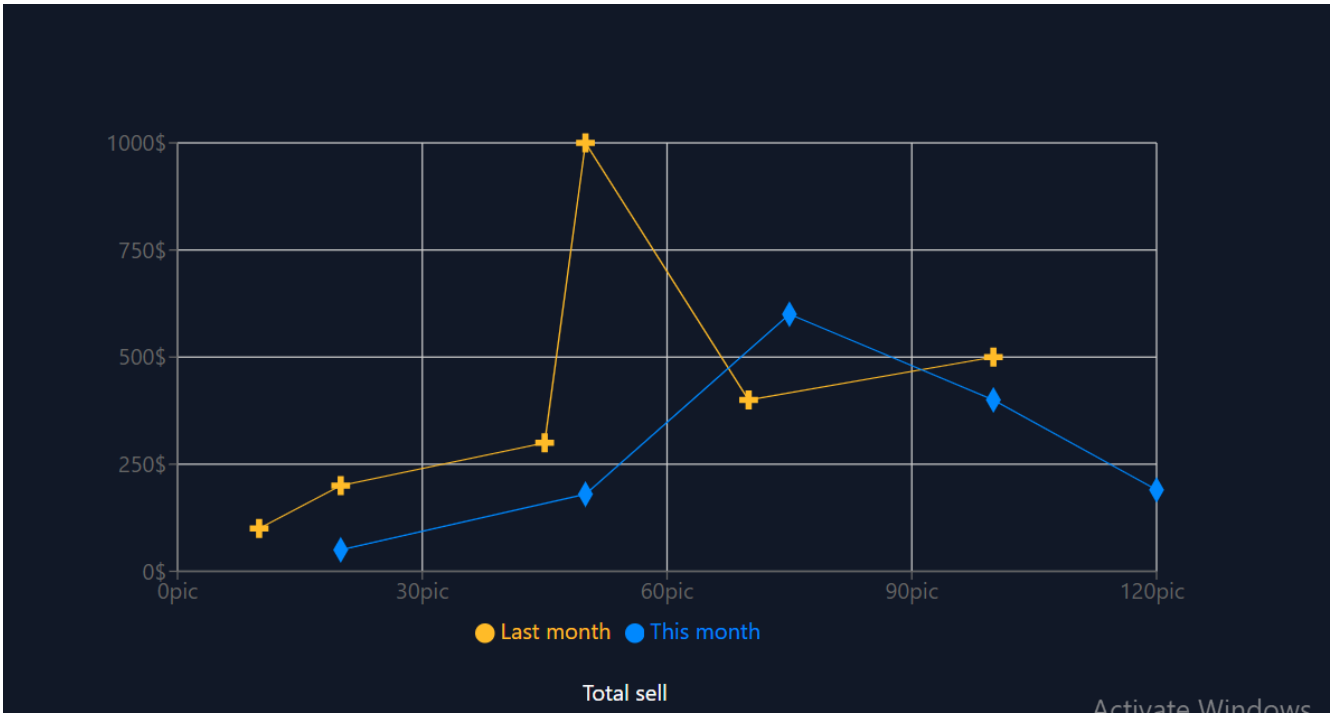

Fig 9.6: System Interface Dashboard

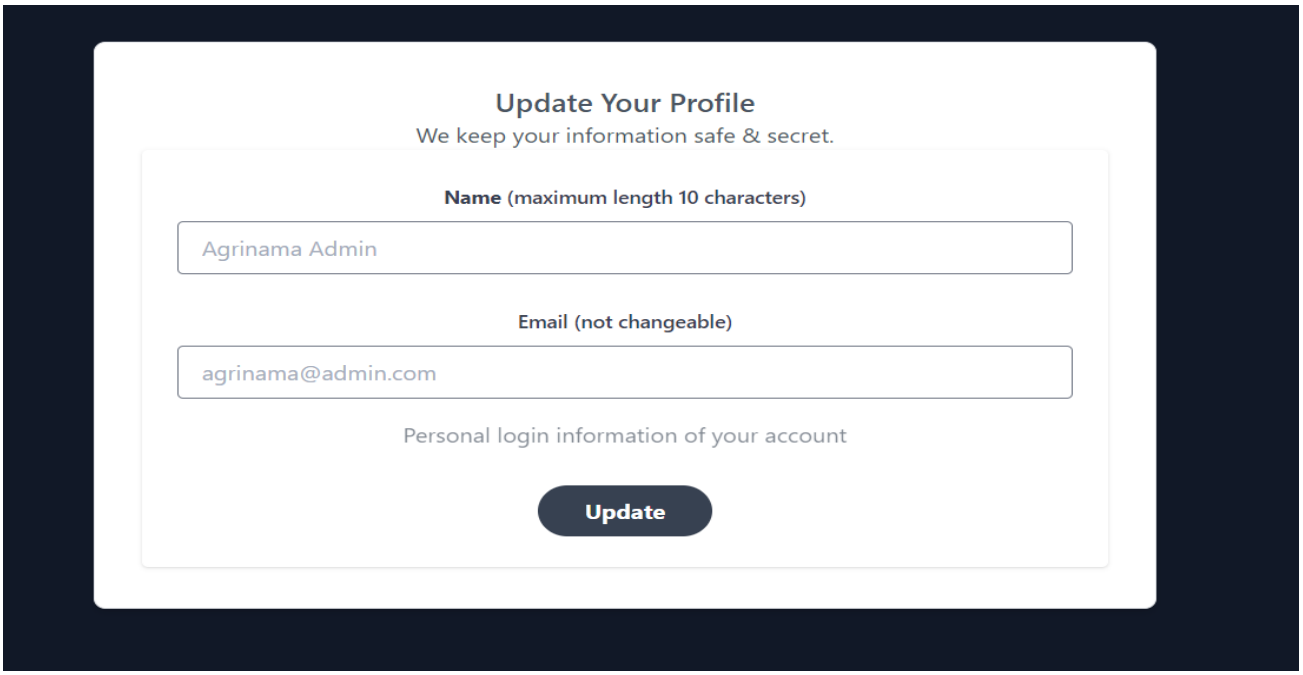

Fig 9.7: System Interface Dashboard

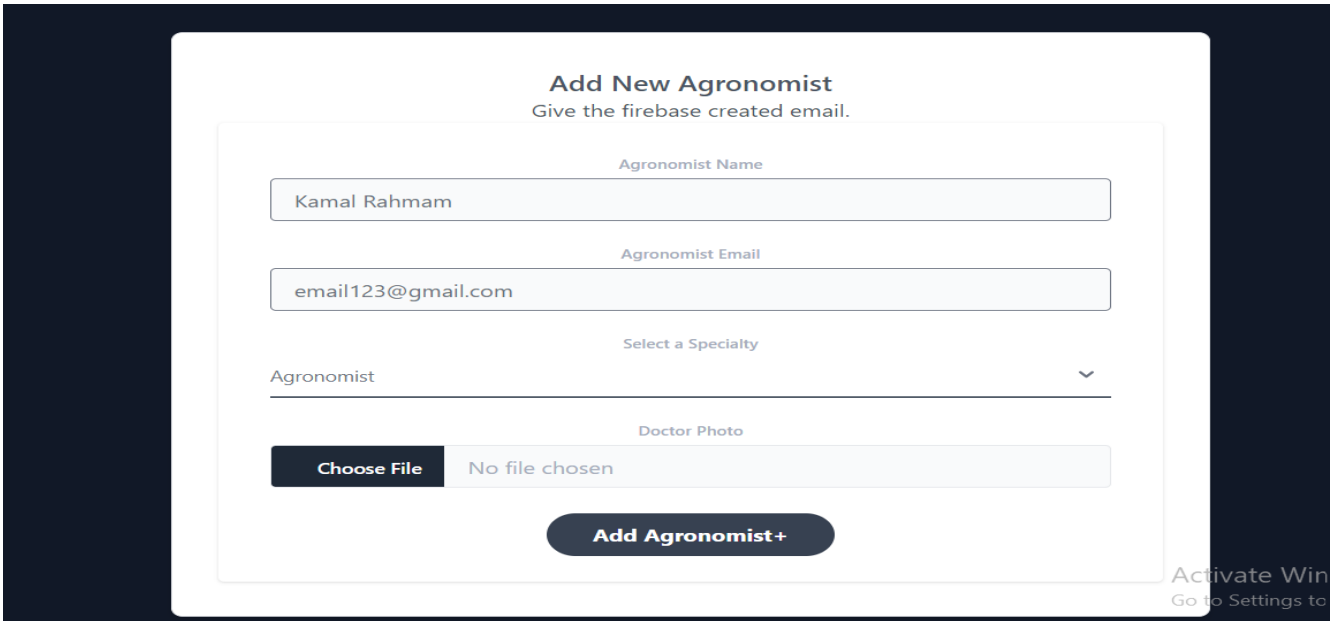

Fig 9.8: System Interface Dashboard

Chapter 10-Deployment / Development

10.1 Core Module Coding Samples:

I divided the effort into manageable, targeted tasks, which made the development process surprisingly simple. I used HTML, CSS, and JavaScript, among other computer languages, to build the suggested framework. Here are some snippets that show how some of the code is implemented.

Code:

```
import { useState } from 'react';
import { GoogleGenerativeAI }  from "@google/generative-ai";

const genAI = new GoogleGenerativeAI("AIzaSyDloTf7rqokH7CW1vISzZRGYdlkPYj7R6A");

const AIAssistant = () => {
    const [image, setImage] = useState(null);
  const [plantDisease,setPlantDisease]=useState({name:"",scientificName:"",description:""});

  const fileToBase64 = (file) => {
    return new Promise((resolve, reject) => {
      const reader = new FileReader();
      reader.readAsDataURL(file);
      reader.onload = () => {
        const base64String = reader.result;
        const base64WithoutPrefix = base64String.split(',')[1];
        resolve(base64WithoutPrefix);
      };
      reader.onerror = (error) => reject(error);
    });
  };
  const handleImageUpload = async (e) => {
    e.preventDefault()
    const file=e.target.files[0];

    setImage(file);


```

Fig 10.1 image detection code

```
try {

    const model=genAI.getGenerativeModel({model:"gemini-1.5-flash"});
    const imageParts=[
        {
            inlineData:{
                data:await fileToBase64(file),
                mimeType:file.type
            }
        }
    ]
    const result=await model.generateContent([
        "Identify the plant and provide its name, scientific name, and brief description.Return the information i
        ...imageParts

    ]);

    const response=await result.response.text();
    const jsonMatch = response.match(/```json([\s\S]*?)```/);
    if (jsonMatch && jsonMatch[1]) {
      const jsonString = jsonMatch[1].trim(); // Remove any extra whitespace
      setPlantDisease(JSON.parse(jsonString));
    } else {
      console.error("JSON not found in the response");
    }
```


Fig 10.2 image detection code

```
return (<>
 <div className="flex flex-col items-center justify-center mt-5 ">
    <h1 className="text-3xl font-serif mb-2"><span className='text-green-500'>P</span>lan<span className='
    {!image ? (
      <div className="bg-white p-8 rounded-lg shadow-md">
        <label htmlFor="image-upload" className="cursor-pointer">
          <div className="flex items-center justify-center w-64 h-64 bg-gray-200 rounded-lg">
            <span className="text-gray-500">Upload a plant image</span>
          </div>
          <input
            id="image-upload"
            type="file"
            accept="image/*"
            className="hidden"
            onChange={handleImageUpload}
          />
        </label>
      </div>
    ) : (
      <div className="bg-white p-8 rounded-lg shadow-md">
        <img
          src={URL.createObjectURL(image)}
          alt="Uploaded plant"
          className="w-64 h-64 object-contain mb-4"
        />
```


Fig 10.3 image detection code

10.2 Possible problem break down:

All difficulties are divided into smaller, more manageable issues in order to expedite the development process. This method works very well for setting deadlines and completing work step by step. The method that I suggest has several noteworthy characteristics. Breaking down the system is essential for more seamless development. Failing to do so will seriously impede the system's overall advancement.

In this case, the breakdown development process looks like this:

Make a database:

- Define primary and foreign keys
- create queries,
- analyze system data,
- create an entity-relationship diagram (ERD),
- develop a data flow diagram (DFD), and
- establish a system database.

Front-end web design:

- Create a paper prototype using Sketch
- Use HTML, CSS, JavaScript, React.js, Tailwind CSS, Daisy UI to develop the design
- Create Page Links
- Make sure the site is responsive on all devices.

For the system, CRUD:

- Include MongoDB Packages for Managing Update, Delete, and CURT Activities
- Add, Update, and Delete Products
- Post, Update, and Delete blog entries

Administration management:

- Product management.
- Admin panel.
- Include Physicians.

- Manage Users.
- Manage Seller.
- My account

Managing client:

- Modify the profile.
- Make a schedule booking.
- Find the diseases and solution
- Conduct with AI.
- Submit vlog and provide comments.
- Make product comments.
- Display Blog.

Seller management:

- entails adding and managing products.

Management of agronomists:

- Updating Profile.
- An agronomist appointment.
- Counseling

Chapter-11 Testing

We need to give the product kind careful thought. It may be essential to do further testing as part of the next review. This article provides in-depth analysis of the data and other approaches. These sensors are essential for spotting system flaws, which improves system performance and stability.

11.1 Test case:

The paper outlines several kinds of test cases and testing approaches. A vital component of software development is testing, which verifies that all criteria are met and identifies discrepancies between expected and actual results. There are several tests used, including acceptance tests, security tests, unit tests, module tests, and integration tests, among others. Examples of standards for each test situation are provided below:

11.2 Unit Testing:

Every project that seeks to confirm that the project code operates as intended must include unit testing. To increase overall quality, the project is being reviewed and changes and reorganizations are being made. Here are a few real-world instances of unit testing in action:

Integration	Test class	Designer Arman Hosen		
Data Source	Object: test case functionality	Tester Arman Hosen		
Test cases	Testing description	Tasks	Expected result	Actual result
1.1	Users fill out the login form here.	Upon submitting the form, a successful pop-up message will appear.	Shows successful massage.	Shows a user profile.
1.2	Buyer add a product in cart	Click the add to cart button	Product show in the cart	Show a product in the cart.

Table 11.1: Unit testing Table

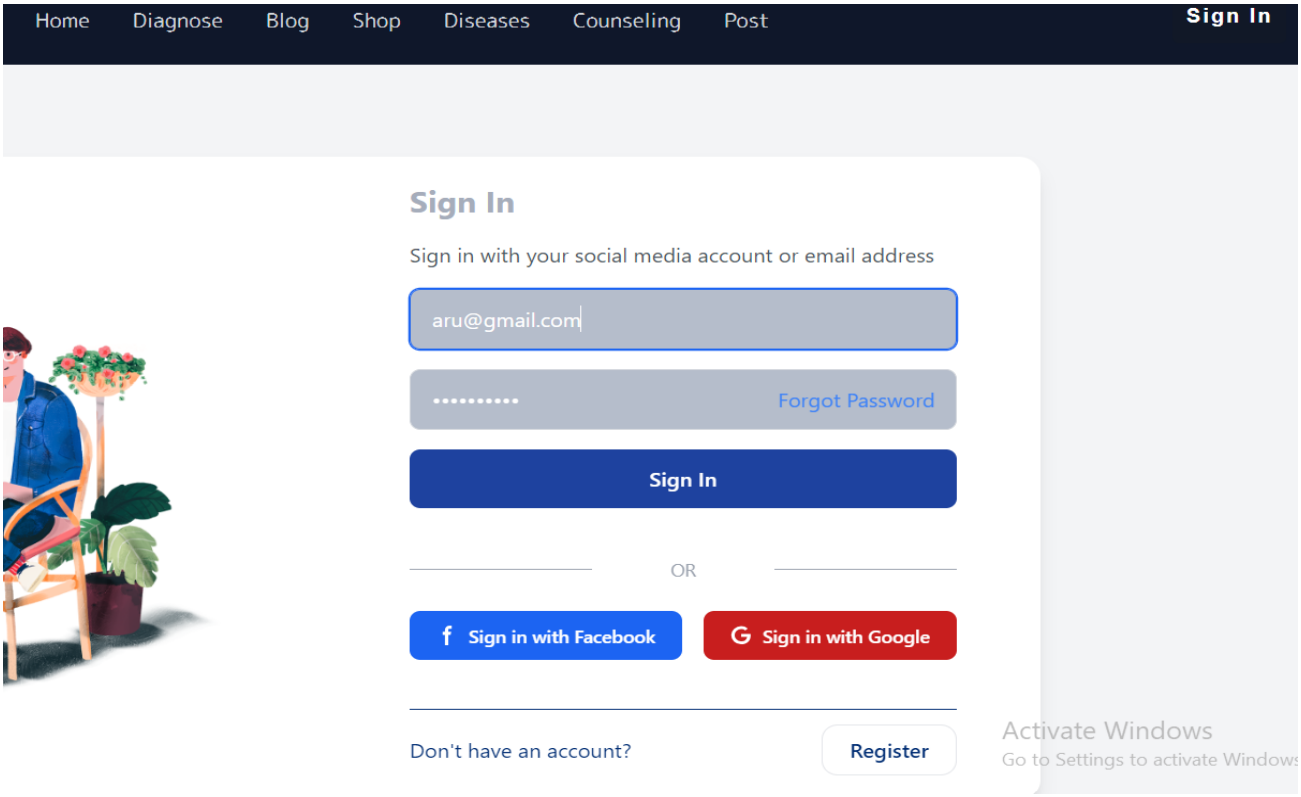

Fig 11.1: Here shows the login

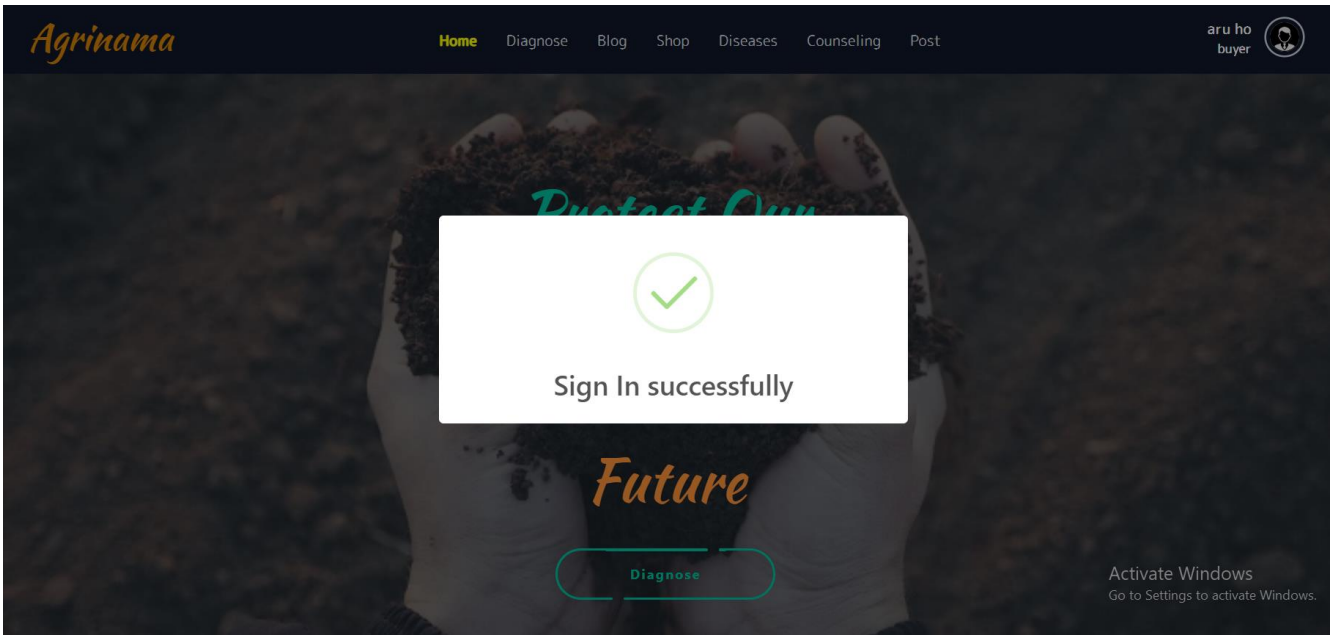

Fig 11.2: Here shows the successful login

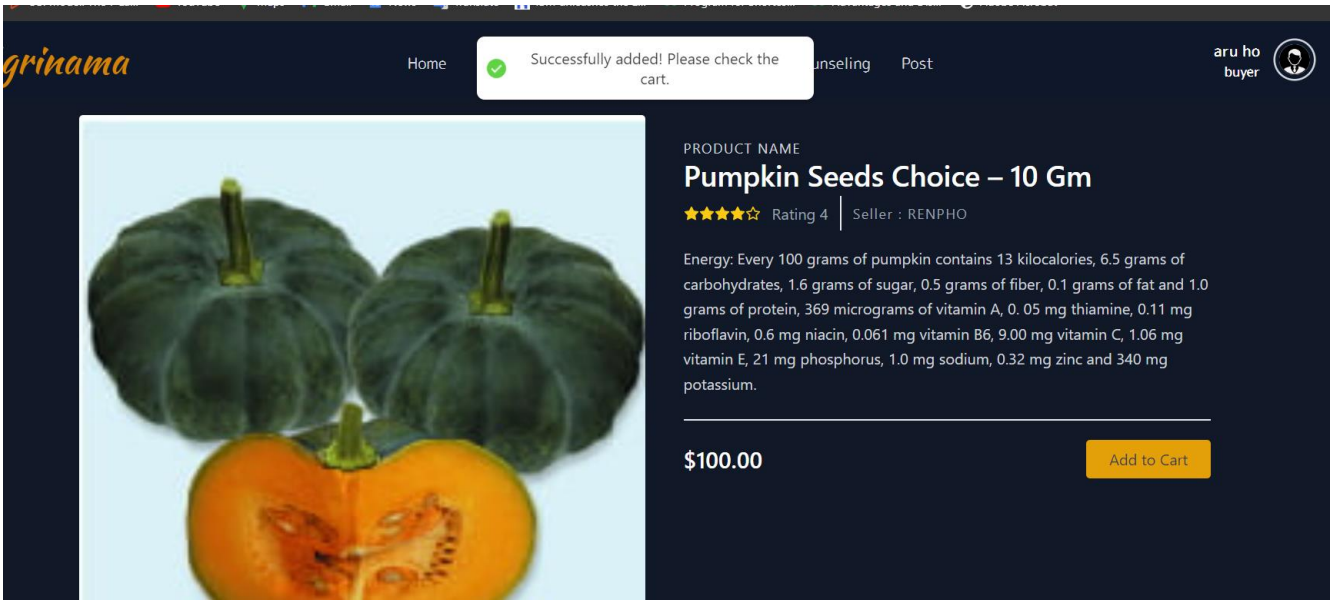

Fig 11.3 successfully add to cart

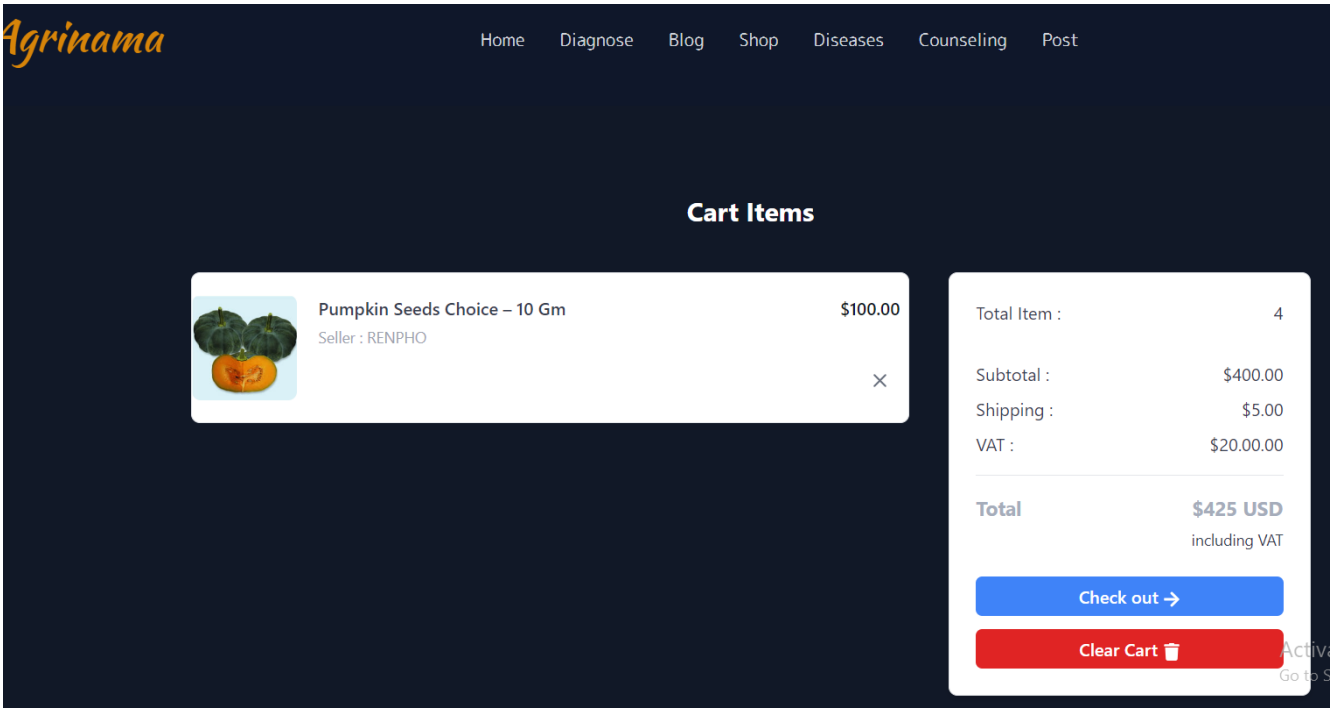

Fig 11.4 show the cart

11.3 Module testing:

Module testing includes conventions, guidelines, courses, or software categories intended to examine systems and applications. Instead of testing every application at once, it's best to concentrate on evaluating your system's fundamental components on a smaller scale. The following is a summary of the module testing results:

Module testing	Test class	Designer Arman Hosen		
Data Source	Object: test case functionality	Tester Arman Hosen		
Test cases	Testing description	Tasks	Expected result	Actual result
2.1	Diseases identification	Select the image and uploaded.	Show the diseases name	Shoe the diseases with details
2.2	Product adding	Enter product information and click add product	Show a successful popup	Show actual popup

Table 11.2: Module Testing

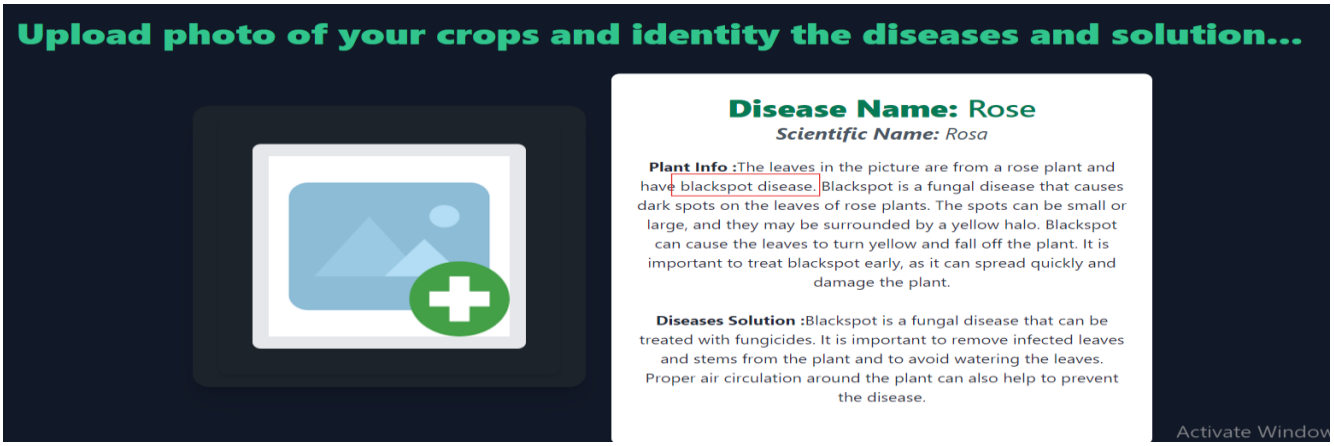

Fig 11.5 identify the diseases

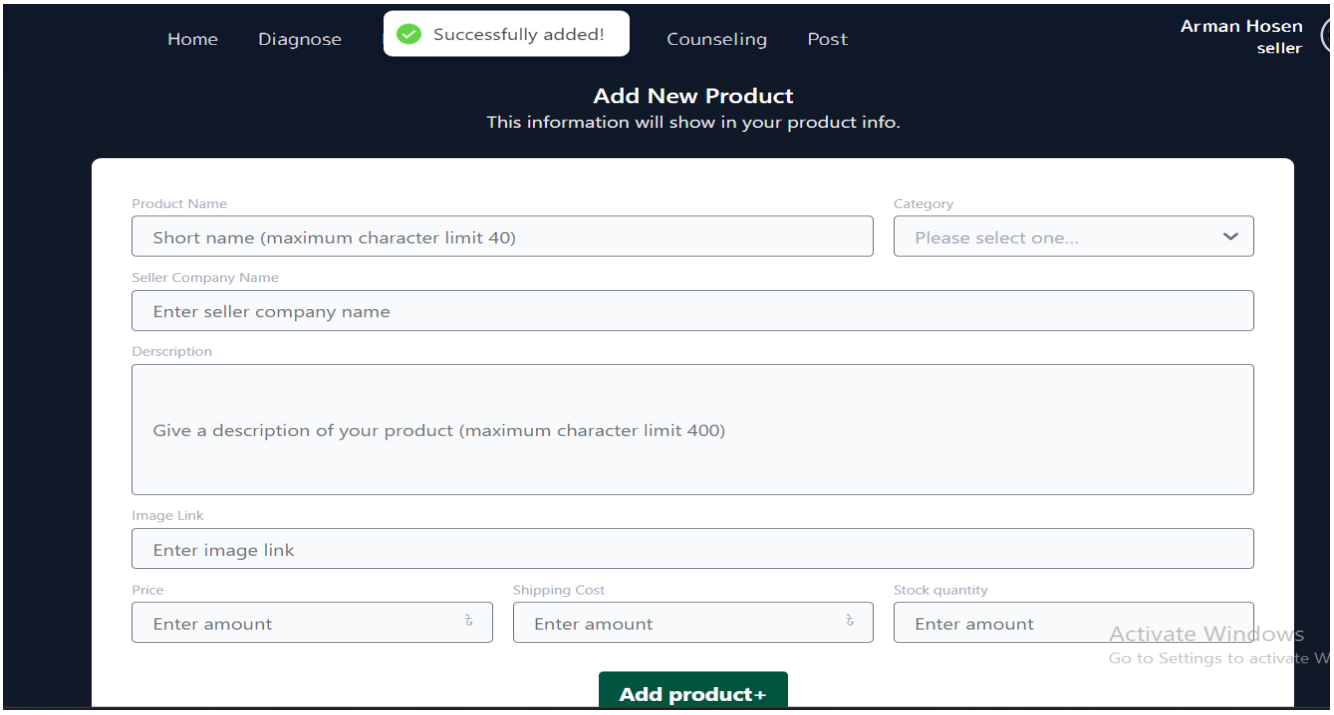

Fig 11.6 add new Product

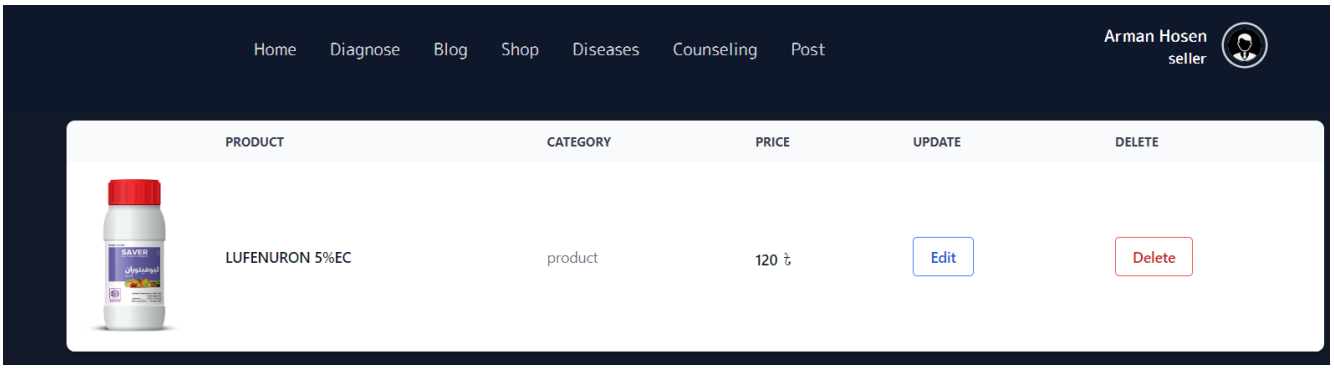

Fig 11.7 show the new Product

11.4 Integration Testing

Each software unit's functioning is confirmed via integrated testing. As an attempt to identify design-related problems, the archive integration test is pertinent. The following integration test is provided below:

Module testing	Test class	Designer Arman Hosen		
Data Source	Object: test case functionality	Tester Arman Hosen		
Test cases	Testing Scenario	Tasks	Expected result	Actual result
2.1	Enter the right information.	Enter email and right password is mandatory.	Give the incorrect massage.	Show off the massage itself.
2.2	Booking appointment	Fill the right information and booked	displays successful booking massage.	displays the booking in my appointment

Table11.3: Integration Testing

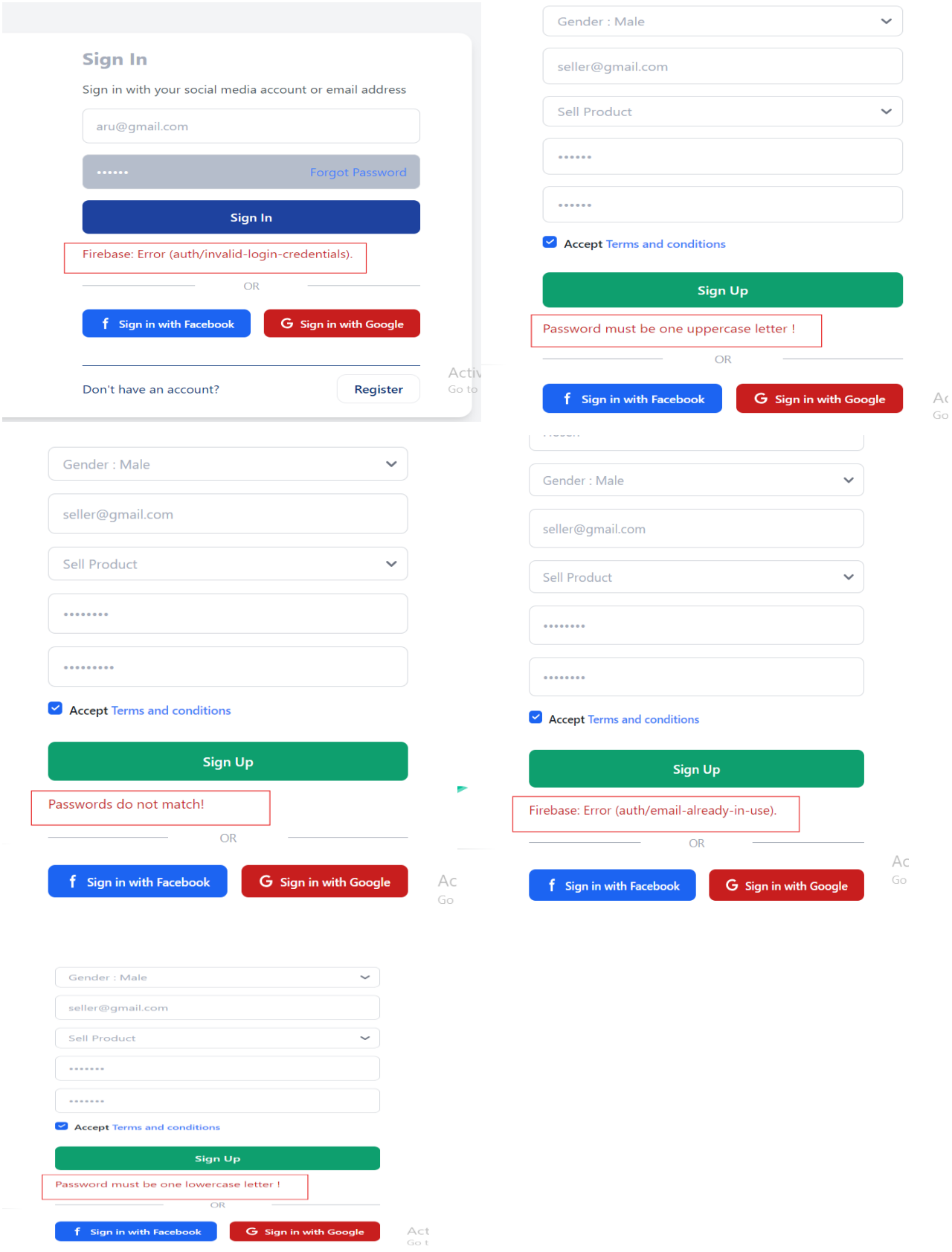

Fig 11.8 login with right information

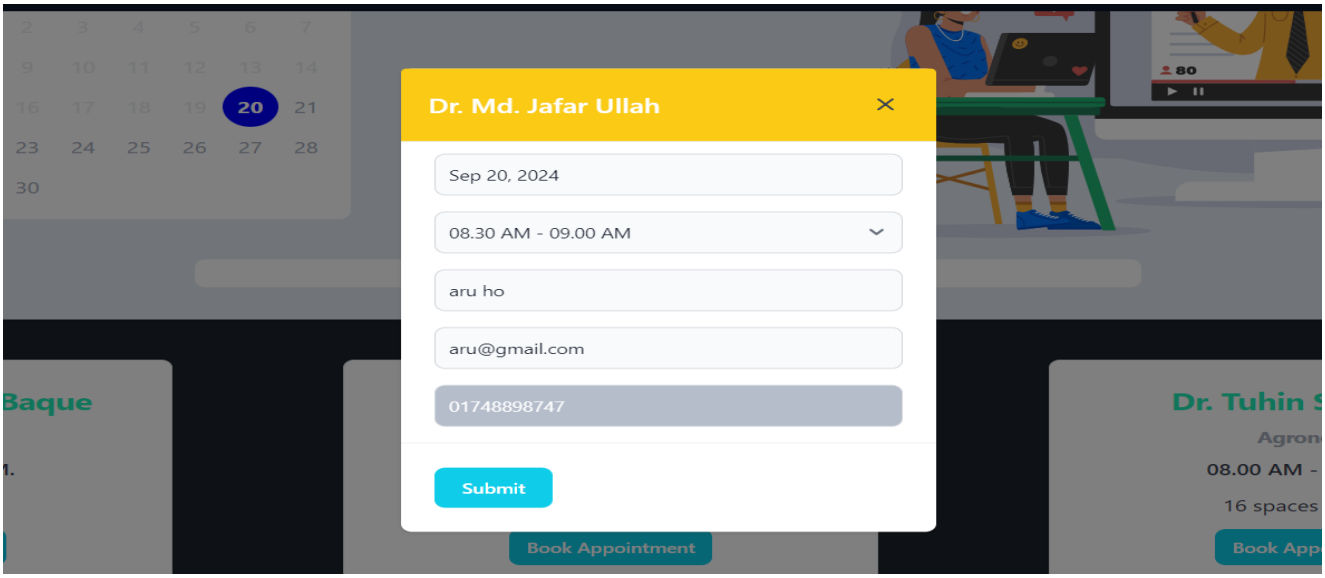

Fig 11.9 booking appointment

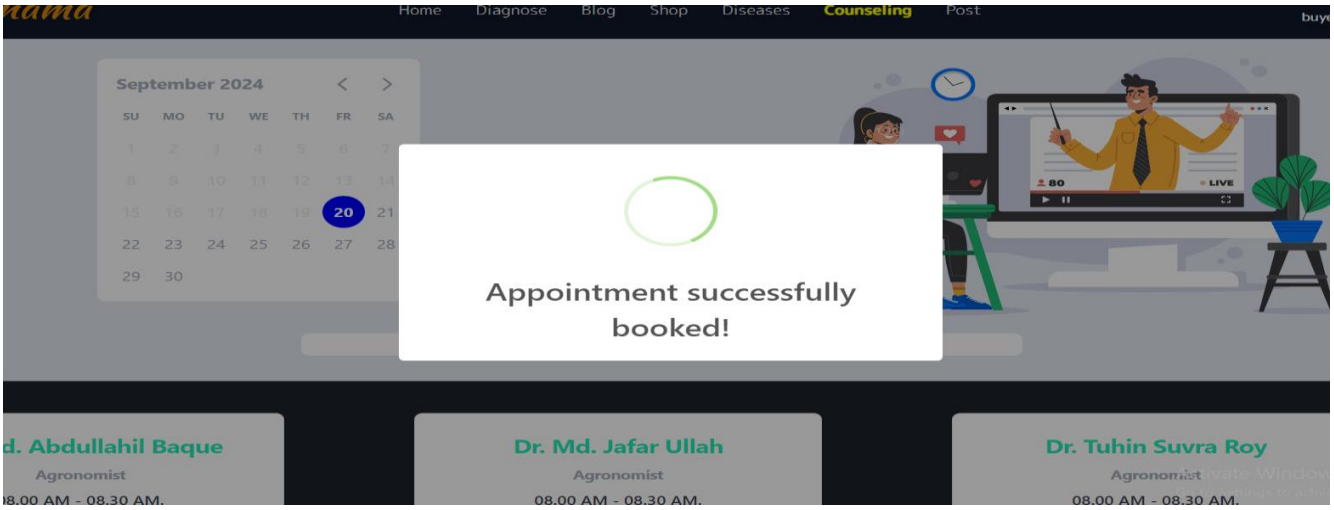

Fig 11.10 appointment booking successfully booked

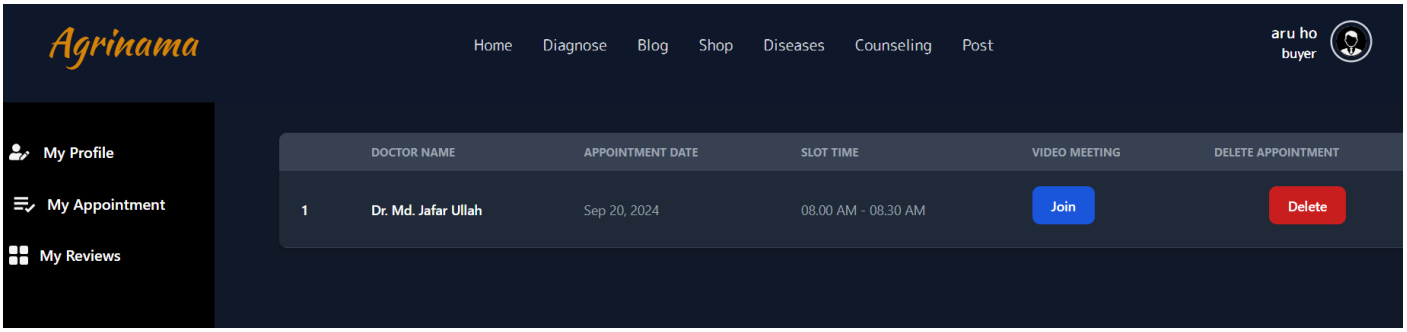

Fig 11.11 show the appointment

Chapter 12-Implementation

12.1 Training:

Improving things involves learning a lot. People must be instructed on the system's use. Training makes it easier for users to comprehend and use the technology. Here are a few diverse approaches of educating others about it.

SL No	Users	Training section	Duration	comments
1	Admin	Manage (create/ delete / (User/Seller/Doctor/ Product)	1.2 hour	Here, the Admin finds it simple to manage the User, Seller, Doctor, and Products.
2		admin panel	40 min	The admin can monitor the admin panel with ease.
3		Add new agronomist	30 min	Here, adding a new doctor is simple for the admin to grasp.
4		Manage seller	15 min	How to manage sellers is simple for the admin to grasp.
5		Manage user	15 min	Here, the administrator can handle users with ease.

Table 12.1: Tanning

12.2 Big bang:

Its specific purpose is to start a new system and shut down an existing one. The main choice is to go on with installing the new system when the testing is over. There might be delays while moving data from the old system to the new platform. Additionally, there is always a chance that data may be lost or corrupted throughout the conversion process, especially if page management is involved.

- **Pilot:** In order to make testing easier, the system is being set up appropriately. Some firms have signed contracts after a certain amount of time, and the last system installation is planned when the plan is carried out successfully.

12.3 Recommended implementation process

I think we may begin experimenting with the system in other departments inside the company to see how it functions. We refer to this as a trial project. We may formally begin using the system if all goes according to plan and every feature is operational.

Chapter 13-Critical Appraisal and Evaluation

I spoke about paying careful attention to things. I spoke about both successful and unsuccessful ventures. It's critical to accept the results as satisfactory. I also spoke about and indicated if any things weren't up to grade. I need guidance on how to address the requirements I look at in that part for the project's future phases.

13.1 – Objective that could be met

13.1.1 Success rate against each objective

The following are the three elements that make up each goal's success rate. Three types of objectives: academic, business, and personal.

Academic objectives:

- Make sure visitors can easily comprehend and navigate the website.
- Assess if the appropriate approach was used in developing this system.
- Examine if the system is practicable by conducting a study.
- Evaluate the possible hazards that may arise.
- Efficiently design and construct the database.
- Make sure you carefully review and record all the details in order to develop a complete system.
- Establish uniform documentation that is available to everyone.
- Make sure the documentation is comprehensible and unambiguous for all parties concerned.

Business objectives:

- Improve Your Accessibility.
- Spread Knowledge.
- Offer Tailored Assistance.
- Raise Awareness of agricultural.
- Work Together with Experts Boost Interaction with Users.

- Increase Outreach.

Personal objectives:

- System validation is required.
- It is necessary to verify the system.
- The system has to be secure,
- dependable, and error-free.

13.1.2 How much better could have been done:

- Concurrent video calls between many users.
- System for audio calling.
- Option for live chat.
- agronomist evaluation.
- Options in PDF format.

13.1.3 How match better solution of the features?

- quicker than other frameworks.
- The system will function seamlessly and dependably.
- It is fully protected.
- Possess a performance rating.

3.1.4 Which features could be untouchable.

- A visit with the agronomist.
- Post / review

Chapter 14 Conclusion

14.1 Summary of the project

An inventive way to help farmers make educated choices regarding crop management, pesticide usage, and seed selection is the "Seeds and Pesticides Decision with Chat Bot" initiative. The chatbot combines machine learning, artificial intelligence (AI), and real-time data to provide customized suggestions based on a range of variables, including crop kinds, weather patterns, and soil type. The chatbot's main goal is to make agricultural decision-making easier for farmers, especially in areas where access to contemporary technology and professional guidance is scarce. Farmers from a variety of backgrounds may use the system with ease since it is designed to be available via mobile and online platforms and supports multilingual inputs, including local languages.

14.2 Goal of the project

The "Seeds and Pesticides Decision with Chat Bot" project's main objective is to provide farmers with an intelligent, user-friendly tool that helps them make data-driven choices about crop management, pesticide usage, and seed selection.

In conclusion, the project seeks to benefit the agriculture industry by offering a workable, technologically advanced solution that improves decision-making, increases output, and promotes sustainable farming methods.

14.3 My experience:

I've gained a great deal of knowledge about gathering information, meeting deadlines, and problem-solving. Even though it was challenging to start again, doing so has allowed me to grow and learn more in all of my future endeavors. Managing finances and scheduling time have been significant tasks. I am certain that the expertise acquired from this venture will prove to be very beneficial in the future. I appreciate God for this journey's knowledge, bravery, and mental clarity. I also thank my friends and family for their unwavering support.

References

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3. Organic Agricultural Solutions — Working to foster the improvement and widespread adoption of organic farming systems. Cultivating organic research, education, and federal policies. Resources. Education. https://ofrf.org/?gad_source=1&gclid=CjwKCAjwl63BhBWEiwApN6_klx7HCCvL8kjVEwV2zsR--y4dddl4oLm29nR0UGdW4H9kUa_J5yMxoCQCEQAvD_BwE
4. Meet Plant Parent – the app that offers solid plant care solutions. With Plant Parent, you can become an instant green thumb and keep your plants not just happy, but thriving! https://plantparentai.com/

Appendices

Test Scripts

Requirements Catalogue:

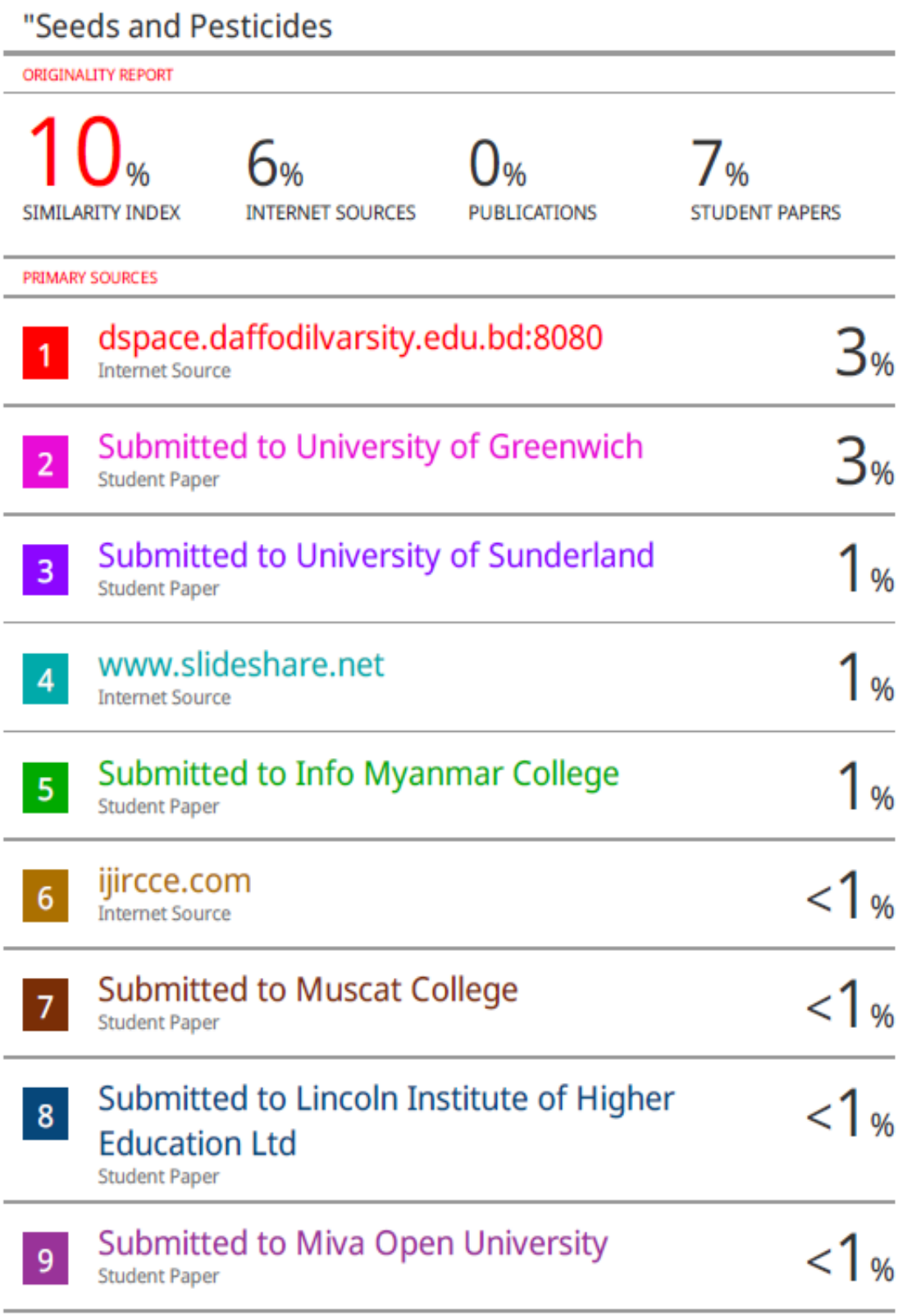
Admin:

- Product management.
- Product order management.
- Agronomist management.
- Seller management.
- vlog management.
- User profile management.

User:

- registration/login
- booking.
- diseases detection
- update profile
- product order
- Add vlog

Plagiarism Report



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