"Farmaide"
A helping hand for your farm

Poly Bhoumik
Senior Lecturer, Department of CSE, DIIT
Email: poly_nu@diit.edu.bd

Sadia Afrin Farha
Email: Sadia180116@diit.edu.bd

A.F.M Enamul Hossain Khan
Email: E namul180107@diit.edu.bd

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Abstract: *Around half of the population of Bangladesh is primarily involved in agriculture. The majority of lands in Bangladesh is devoted to crop cultivation. Bangladesh is a land of suitable growth for Paddy, Jute, tea, pulses, Vegetables and fruits. Despite the contribution of agriculture in such large percentage of Bangladesh's overall economy, Farmers always struggle to fully commercialize their production due to natural calamities and inefficient infrastructure. Also, for a lack of knowledge, investors are afraid to invest in this Sector. So, farmers need money to become successful, investor needs platform to secure invest. And analysing this situation we are introducing a common platform for all. Besides this we also propose a marketplace where farmers will be able to directly sell their product to customer which eliminating the need for intermediaries and providing greater economic opportunities for farmers. In addition to facilitating communication between these two groups, we also plan to introduce a range of advanced technologies that can help to improve agricultural practices in Bangladesh*

Keyword: *Farmers, Investors, Agriculture, Farming, Modern farming tech, Irrigation robocar, soil moisture sensor, Disease finder.*

1. INTRODUCTION

Bangladesh, a land of lush green fields and fertile soils, holds immense potential for agricultural growth and development. However, despite the rich agricultural resources available in this country, farmers here struggle with poverty, which hinders their ability to properly seed and cultivate crops. In addition, investors who are eager to invest in the food sector often lack the necessary knowledge and expertise to do so confidently.

To address this issue, we propose an innovative solution that brings farmers and investors together on a single platform. This platform serves as a hub where investors can learn about the opportunities for agricultural development in Bangladesh, while farmers can directly communicate their needs and collaborate with investors to bring their visions to life.

In addition to facilitating communication between these two groups, we also plan to introduce a range of advanced technologies that can help to improve agricultural practices in Bangladesh. For instance, our disease detection device is designed to quickly and accurately identify common crop diseases, while our soil testing device can help farmers better understand the nutrient content and other key properties of their soils. We also offer a robot that can water crops according to specific instructions, providing a more precise and efficient approach to irrigation.

All of these tools, along with other fertilizers and necessary medicines, will be available for purchase through our e-commerce site. Farmers will also have the ability to add their own products to the site and sell them directly, eliminating the need for intermediaries and providing greater economic opportunities for farmers.

By bringing together farmers and investors and providing them with the necessary resources and tools, we believe that our platform can help to unlock the vast potential of Bangladesh's agriculture sector.

2. BACKGROUND STUDY, PROBLEM AND SOLUTION

The proposed project to collaborate farmers and investors in Bangladesh's agriculture sector is crucial in light of the country's high dependence on agriculture. According to the data provided, 17.5% of Bangladesh's GDP is dependent on agriculture, indicating the significant economic impact of the sector. Moreover, 70.1% of the land in Bangladesh is devoted to agriculture, highlighting the importance of the sector to the country's food security.

Despite the high contribution of agriculture to Bangladesh's economy and food security, many farmers in Bangladesh are poor and lack the resources to properly seed their crops. This is reflected in the fact that 48.4% of people in Bangladesh are connected with agriculture in some way, indicating the high reliance on the sector for livelihoods.

The proposed project aims to address these challenges by providing a platform that connects farmers and investors, enabling communication and collaboration on agricultural projects. This can help to improve agricultural practices, increase productivity, and ultimately contribute to the economic growth and development of the agriculture sector in Bangladesh. Additionally, the introduction of advanced technologies such as disease detection devices, soil testing devices, and irrigation robots can help to enhance crop yields and improve the quality and safety of food produced in Bangladesh.

Overall, the project can play a crucial role in promoting sustainable and environmentally responsible agricultural practices in Bangladesh, reducing poverty, and improving the livelihoods of farmers in the country.

The current system in Bangladesh's agriculture sector faces several challenges, including a lack of communication and collaboration between farmers and investors, limited access to resources and technology, inadequate infrastructure, environmental challenges, and a lack of knowledge and expertise. The proposed project aims to address these challenges by providing a platform for communication and collaboration between farmers and investors, introducing advanced technologies to enhance agricultural practices, and promoting sustainable and environmentally responsible practices.

The proposed project offers solutions to the challenges facing Bangladesh's agriculture sector through improved communication and collaboration, advanced technologies, and sustainable practices. By facilitating communication and collaboration between farmers and investors, introducing advanced technologies like disease-detecting devices, soil testing kit and automated irrigation systems, and promoting sustainable practices such as the use of organic fertilizers, the project aims to improve productivity, reduce costs, and promote sustainable development in the sector.

3. METHODOLOGY

The methodology for the automated irrigation robot car project involves a systematic approach to achieve the goal of designing and constructing a robot that can autonomously irrigate plants based on soil moisture levels. The first step is to analyze the project requirements, considering factors like area size, plant types, and irrigation frequency. Once requirements are defined, suitable components such as DC motors, motor drivers, soil moisture sensors, water pumps, and an Arduino board are selected. These components are integrated into the robot car's hardware, with careful attention to proper wiring and connections.

The next phase focuses on programming the robot car's behavior. Motor control logic is developed using the provided Arduino code to enable movements such as forward motion, turning, and stopping. Soil moisture sensing is implemented by interfacing with the soil moisture sensor and establishing a calibration process to ensure accurate readings. An irrigation mechanism is then integrated, where the water pump activates when soil moisture falls below a specified threshold, ensuring effective plant watering.

Testing and calibration are crucial steps to validate the system's performance. The robot car is tested in a controlled environment to fine-tune motor control and ensure accurate soil moisture detection. Optional features like obstacle avoidance can be implemented using additional sensors. To enhance the project, data logging and reporting capabilities can be added to track moisture levels and irrigation events.

Safety considerations are paramount throughout the project to prevent potential risks to people, animals, and property. Emergency stop mechanisms may be incorporated if necessary. Comprehensive documentation, including schematics, assembly instructions, and final Arduino code, is created to facilitate future reference and sharing. Once thoroughly tested, the robot car is deployed to the target area. Emergency stop mechanisms may be incorporated if necessary. Comprehensive documentation, inclu Continuous maintenance, monitoring, and potential improvements based on field data contribute to the project's long-term success. If intended for others to use, user training can be provided to ensure safe and effective operation. The methodology provides a structured framework to guide the project from inception to implementation, with flexibility to accommodate project-specific needs and insights gained during the process.

4. OVERALL PROJECT DISCUSSION

Our proposed system aims to positively impact Bangladesh's agriculture sector by aiding farmers and investors, offering valuable resources, and establishing a direct sales channel. Our approach addresses accessibility through a user-friendly web-based system, ensuring ease of use and security. We intend to enhance farmers' livelihoods, foster a shared platform for farmers and investors, and benefit the wider population. Overcoming language barriers and technological limitations is a priority, making our solution widely accessible for the masses.

After implementing all the features in our project, we will get these results:

- Investors have knowledge in Agricultural sector.
- Farmar can sell their product directly to consumer.
- A platform to directly discuss about area based agricultural environment.
- Primarily leaf based disease detected.
- Soil Moisture level data known.
- Nursing and irrigation done by robocar.
- Farmers easily can enjoy and understand the service.
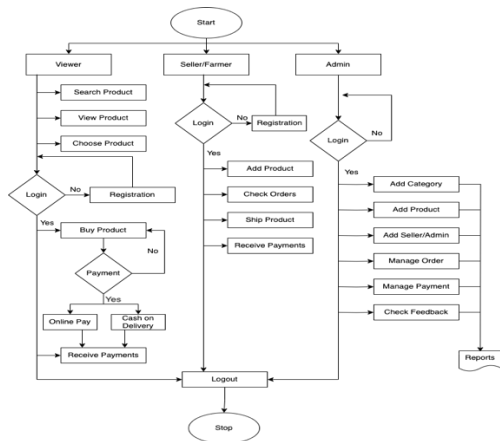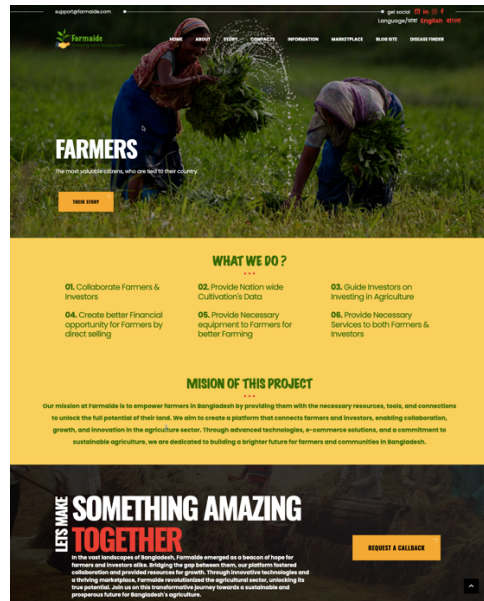- Consultancy will be provided.

5. DIAGRAMS
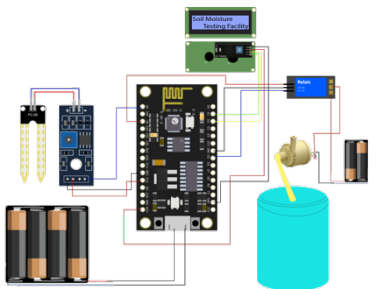### Use Case Diagram
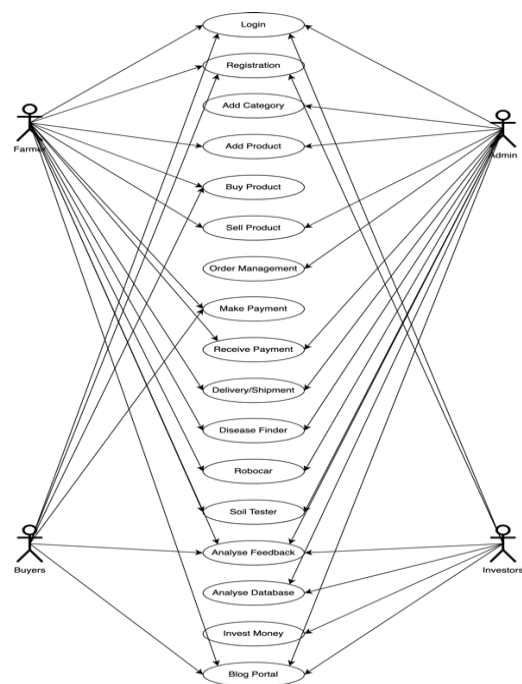
Flow Chart of Marketplace

Circuit Diagram of Soil Moisture

Circuit Diagram of Soil Moisture
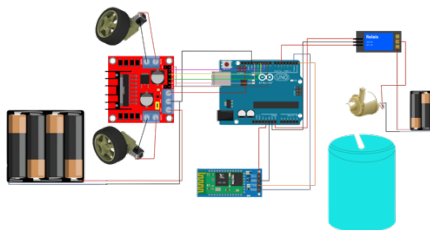
6. IMPLEMENTATION

Hardware

Website

Disease Finder

Predicted Crop Disease : Brown Spot
Probability: 99.71%
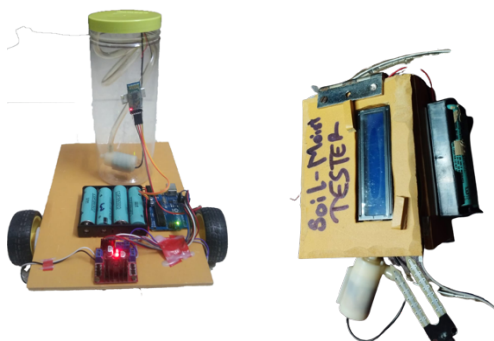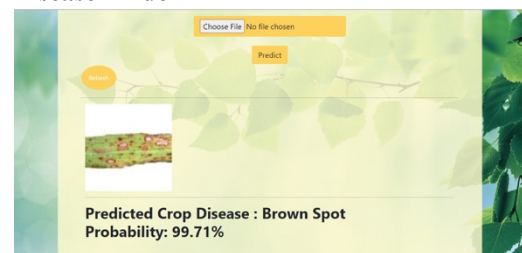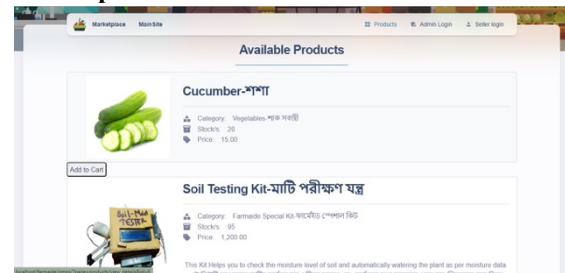
Marketplace

7. CONCLUSION

The proposed solution aims to address the issue of poverty among farmers in Bangladesh and the lack of knowledge and expertise among investors in the food sector. The solution is an innovative platform that brings farmers and investors together to facilitate communication, collaboration, and investment in agriculture. The platform offers advanced technologies, such as disease detection devices, soil testing devices, and crop watering robots, to improve agricultural practices in Bangladesh. Additionally, an e-commerce site will be available for farmers to sell their products directly, providing greater economic opportunities. The goal is to unlock the vast potential of Bangladesh's agriculture sector by improving agricultural practices, providing greater access to resources, and increasing economic opportunities for farmers.

REFERENCES

[1] **World Bank.** (2016/10/07). *Bangladesh: Growing the Economy through Advances in Agriculture*-https://www.worldbank.org/en/results/2016/10/07/bangladesh-growing-economy-through-advances-in-agriculture

[2] **Food and Agriculture Organization of the United Nations (FAO).** (2023/03/23). *Bangladesh.* Retrieved from http://www.fao.org/bangladesh/en/

[3] **The Financial Express.** (2023/02/27). *E-commerce platforms gain popularity in Bangladesh.* Retrieved from-https://thefinancialexpress.com.bd/trade/e-commerce-platforms-gain-popularity-in-bangladesh-1561627585

[4] **Sommerville, I. (2008).** *Software Engineering (7th ed.).* Delhi: Pearson Education Ltd.

[5] **United Nations Development Programme (UNDP).** (2023/02/13). *Economic Development in Bangladesh.* Retrieved from-http://www.bd.undp.org/content/bangladesh/en/home/countryinfo.html

[6] **Bangladesh Agricultural Research Institute (BARI).** (2022/12/28). *Overview* Retrieved from http://www.bari.gov.bd/

[7] **The Daily Star.** (2023/03/09). *Agriculture key to Bangladesh's economic growth.* Retrieved from-https://www.thedailystar.net/business/news/agriculture-key-bangladeshs-economic-growth-2922065

[8] **Valacich, J. A., George, J. F., & Hoffer, J. A.** (2000). *Essentials of Systems Analysis and Design (2nd ed.).*

[9] **JavaScript.** (2023/02/27). *Mozilla Developer Network.* Retrieved from https://developer.mozilla.org/en-US/docs/Web/JavaScript

[10] **PHP.** (2023/02/27). *Overview.* Retrieved from https://www.php.net/

[11] **Visual Studio.** (2023/02/27). *Overview.* Retrieved from https://visualstudio.com/

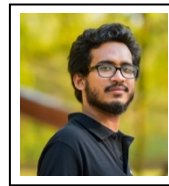[12] **Laravel.** (2023/02/27). *Overview.* Retrieved from https://laravel.com/

Authors Biography (Mandatory)

Poly Bhoumik
Senior Lecturer
Dept. of CSE
Daffodil Institute of IT
Email: poly_nu@diit.edu.bd

Sadia Afrin Farha
Email
Sadia180116@diit.edu.bd

AFM Enamul Hossain Khan
Email
Enamul180107@diit.edu.bd