A Project Proposal for Partial Fulfilment of the Course Unit
IT3162 - Group Project
For the Degree of Information Technology

AgroGo:

A Comprehensive Agricultural Platform

2020/ICT/12	Ms.	Shahla A.A.F.S.
2020/ICT/17	Mr.	Lakshitha W.T.
2020/ICT/25	Mr.	Neththasingha N.A.R.H.
2020/ICT/53	Ms.	Sushmitha C.V.
2020/ICT/54	Ms.	Epa V.D.S.N.
2020/ICT/68	Mr.	Samarasinghe S.W.S.J.
2020/ICT/74	Ms.	Afthaff J.F.T.

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Declaration

We hereby declare that the project proposal submitted for evaluation of course module IT3162 leading to the award of a Bachelor of Science in Information Technology is entirely our own work, and the contents taken from the work of others have been cited and acknowledged within the text. This proposal has not been submitted for any degree at this University or any other institution.

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2020/ICT/74	Ms. Afthaff J.F.T.

I recommend the project to be carried out by the students.

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Dr. S.Kiruskanth
Supervisor,
Lecturer / Senior Lecturer,
Department of Physical Science,
Faculty of Applied Science.

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Date:

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1.0   Introduction

1.1   Introduction

AgroGo is a comprehensive digital platform aimed at revolutionizing the agricultural sector in Sri Lanka. The platform empowers farmers, suppliers, and agricultural experts by providing tools to enhance productivity, promote sustainable practices, and facilitate fair trade. It addresses common challenges such as unpredictable weather, market volatility, and limited access to modern tools by integrating advanced technologies into a single solution.

1.2   Objectives

- Provide farmers with access to a marketplace, crop calendars, and expert support.

- Eliminate intermediaries, enabling direct trade between farmers and suppliers.

- Enhance crop management through AI-powered diagnostics.

- Support sustainable practices by promoting efficient farming tools and techniques.

- Offer multilingual content in English, Tamil, and Sinhala to ensure inclusivity.

1.3   Benefits of this Research

- Improves Farmer Income: Fair pricing through direct sales.

- Facilitates Market Competition: Farmers access better deals and competitive prices.

- Reduces Risks: Crop calendars and weather forecasts help minimize the impact of adverse conditions.

- 24/7 Support: AI chatbot provides real-time crop care advice.

- Scalable Solution: Platform can grow with user demand, accommodating future business needs.

2.0 Background

2.1 Background

Sri Lanka's agriculture sector plays a crucial role in food security and employment but faces multiple challenges, including weather fluctuations, market instability, and lack of technology adoption. AgroGo bridges these gaps by offering a digital platform where farmers can directly trade with suppliers, access modern farming tools, and receive expert advice.

2.2 Review of Existing Systems

Several platforms exist that address aspects of agriculture, such as crop forecasting tools and e-commerce solutions. However, many systems lack comprehensive integration, real-time advisory services, or are inaccessible to local farmers. AgroGo differentiates itself by combining multiple features like crop calendars, expert consultation, e-commerce, and AI-powered diagnostics into a single platform tailored to the Sri Lankan agricultural community.

3.0 Material and Methods

3.1 Technological Stack

- **Front-End:**

  - React.js – For building a dynamic user interface.
  - CSS Frameworks (Bootstrap/Tailwind) – Ensuring responsive design.
  - Axios – For making API calls to the backend.

- **Back-End:**

  - Node.js with Express.js – Handling server logic and requests.
  - Firebase – For file storage (e.g., image uploads for disease diagnosis).

- **Database:**

  - MongoDB – Storing user transactions, product listings, and farm records.
  - Mongoose – Managing schemas and data operations efficiently.

3.2 Human Resources

- Front-End Developers: Build and optimize the user interface.

- Back-End Developers: Manage server-side logic and database integration.

- Database Administrators: Maintain the MongoDB database.

- Agricultural Experts: Provide content and ensure practical feature alignment.

- Customer Support Team: Assist users and resolve issues.

3.3   Methods

The AgroGo platform follows an Agile Development Process, which allows for iterative development, flexibility, and continuous feedback from stakeholders. The following steps outline the key phases of development:

Website Development Process

1. **Requirement Gathering**

   - Interviews with farmers, suppliers, and agricultural professionals to identify user needs and expectations.

2. **Design & Prototyping**

   - Prototypes will be created using Figma to visualize the interface and gather early feedback from users.

3. **Development**

   - **Front-end:** React.js will be used to build a responsive interface.
   - **Back-end:** Node.js with Express.js will handle the server-side functionality.

4. **Database Management**

   - Mongoose will define schemas for data storage, including:
     - User details
     - Product catalog for marketplace items
     - Farm Data for tracking yields and conditions

Features Development

- **Marketplace for Crops and Fertilizers**

  - Users can browse and purchase agricultural products.
  - A shopping cart system will help manage orders.

- **AI Chatbot**

  - Provides actionable advice in response to user questions.

- **Crop Calendar**

  - Includes task reminders, planting schedules, and crop recommendations based on weather patterns.

- **Multilingual Support**

  - Supports dynamic language selection (English, Tamil, Sinhala) to enhance accessibility.

- **Payment Gateway**

  – A secure payment system ensures seamless e-commerce transactions.

- **Personalized Dashboard**

  – Displays articles, notifications, and weather forecasts relevant to the user's preferences.

- **Homepage Features**

  – Key platform functionalities will be highlighted to engage users upon visiting the site.

Testing & Deployment

- **Testing**

  – User Acceptance Testing (UAT) will be conducted to verify functionality.
  – Stress tests will evaluate the platform's performance under load.

- **Security Testing**

  – Encryption and secure authentication methods will ensure data protection.

- **Deployment**

  – The development team will prepare the deployment environment to launch the platform smoothly.

4.0   Expected Results

AgroGo will enhance agricultural productivity by:

- Enabling direct trade between farmers and suppliers, improving profitability.
- Supporting farmers with crop management tools and expert guidance.
- Providing secure and seamless e-commerce transactions.
- Promoting sustainable farming practices.
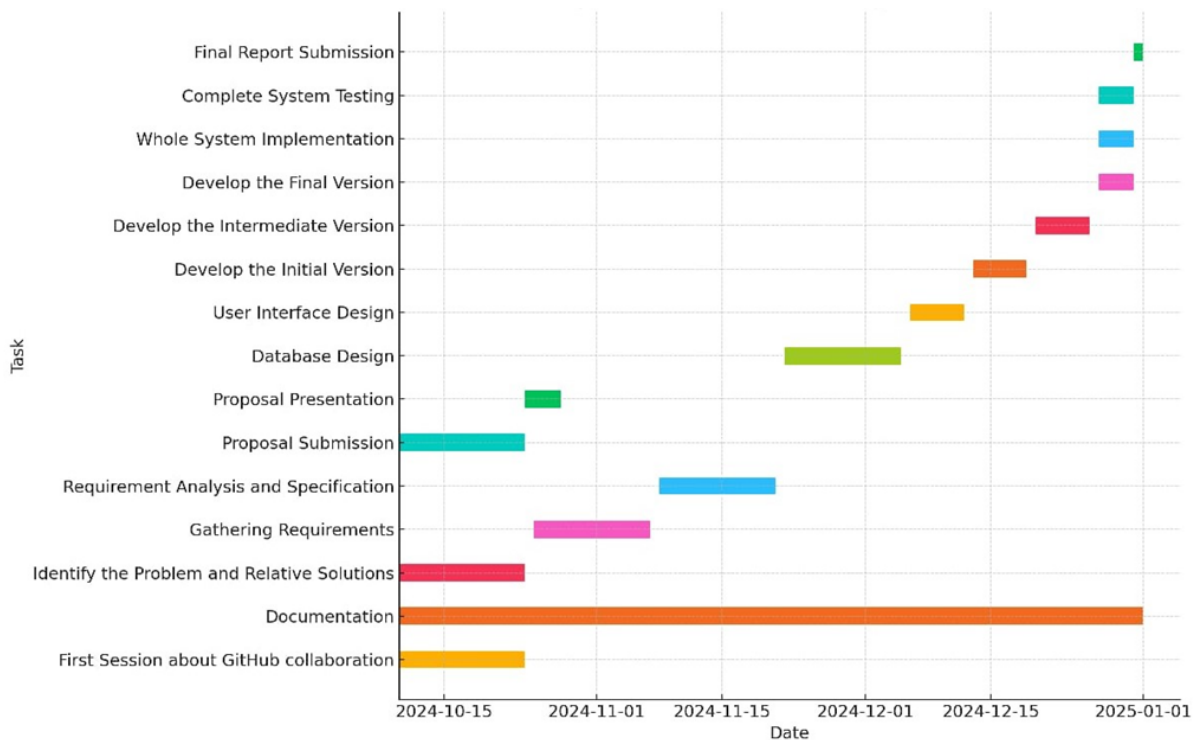
5.0   Timeline of the Research

Figure 1: Gantt Chart

6.0 References

1 Food and Agriculture Organization of the United Nations (FAO). (2020). The Future of Food and Agriculture: Trends and Challenges. `https://www.fao.org`

2 Ministry of Agriculture, Sri Lanka. (2023). Annual Report. `http://www.agrimin.gov.lk`

3 W3Schools. React.js and Node.js Documentation. `https://www.w3schools.com`

4 United Nations. (2019). Digital Agriculture: Transforming Agriculture with AI. `https://www.un.org`

5 Jayasinghe, S. (2022). A Study on the Challenges and Opportunities in Sri Lankan Agriculture. Journal of Agribusiness & Rural Development, 15(2), 50-65.

6 Khanal, P. R. & Uddin, N. (2020). E-commerce Platforms for Farmers in Developing Countries. International Journal of Agriculture Innovations, 8(1), 30-42.

7 Stack Overflow. Questions and Answers on Web Development Technologies. `https://stackoverflow.com`

8 Yara International. (2021). Improving Crop Yields with Digital Tools. `https://www.yara.com`

9 GitHub Documentation. Collaborative Development using GitHub. `https://docs.github.com`

10 World Bank. (2021). Digital Agriculture in Emerging Economies: A Case Study. `https://www.worldbank.org`