IT4010 – Research Project - 2023

Topic Assessment Form

Project ID: TMP-23-156

1. Topic (12 words max)

AGROX - Elevating Cinnamon Industry through Expert Guidance and Support

2. Research group the project belongs to

Software Systems & Technologies (SST)

3. Research area the project belongs to

ICT for Development (ICTD)

4. If a continuation of a previous project:

Project ID	TMP-23-156
Year	2023

5. Team member details

Student Name	Student ID	Specialization
Leader: Ravishan S.A.A.	IT20241032	SE
Member 2: Edirisinghe B.M.	IT20252304	SE
Member 3: Gamaethige G.G.S.A.	IT16026476	SE
Member 4: Ekanayaka E.M.A.I.B.	IT20252786	SE

6. Brief description of the research problem including references (200 – 500 words max) – references not included in word count.

AGROX is a comprehensive application aimed at addressing the challenges faced by cinnamon planters. The application provides a one-stop solution for the industry, offering comprehensive guidance and support for ideal growing conditions, planting, and harvesting procedures.

One of the key features of AGROX is its ability to tackle pest and disease management, specifically, rough bark disease [1]. The application leverages the latest advances in visual computing to provide suggestions for disease control, thereby ensuring the health of the cinnamon plants.

In addition, AGROX also aims to enhance market information and quality assurance for cinnamon through its image processing capabilities [2]. This enables the determination of cinnamon grade, providing a more informed market for both planters and consumers.

Another key advantage of AGROX is its community platform and trained virtual assistant [3]. Unlike traditional methods such as Facebook apps, the information provided in AGROX is approved to guarantee accuracy. This reduces the risk of false information spread and provides a more reliable source of information for the industry.

In conclusion, AGROX is a game-changer for the cinnamon industry. Its comprehensive approach to growing conditions, pest and disease management, market information, and support, make it a valuable tool for cinnamon planters. The application's commitment to accuracy and reliability sets it apart from traditional methods, providing a more trustworthy source of information for the industry.

References:

[1] Proceedings of the symposium on minor export crops (Ed: B. Marambe) 16 – 17 March 2017, Peradeniya, Sri Lanka.

[2] J. R. Balbin, C. D. Del Valle, V. J. L. G. Lopez, and R. F. Quiambao, "Grading and Profiling of Coffee Beans for International Standards Using Integrated Image Processing Algorithms and Back-Propagation Neural Network," in 2020 IEEE 12th International Conference on Humanoid, Nanotechnology, Information Technology, Communication and Control, Environment, and Management (HNICEM), Manila, Philippines, 2020, pp. 1-6, doi: 10.1109/HNICEM51456.2020.9400086.

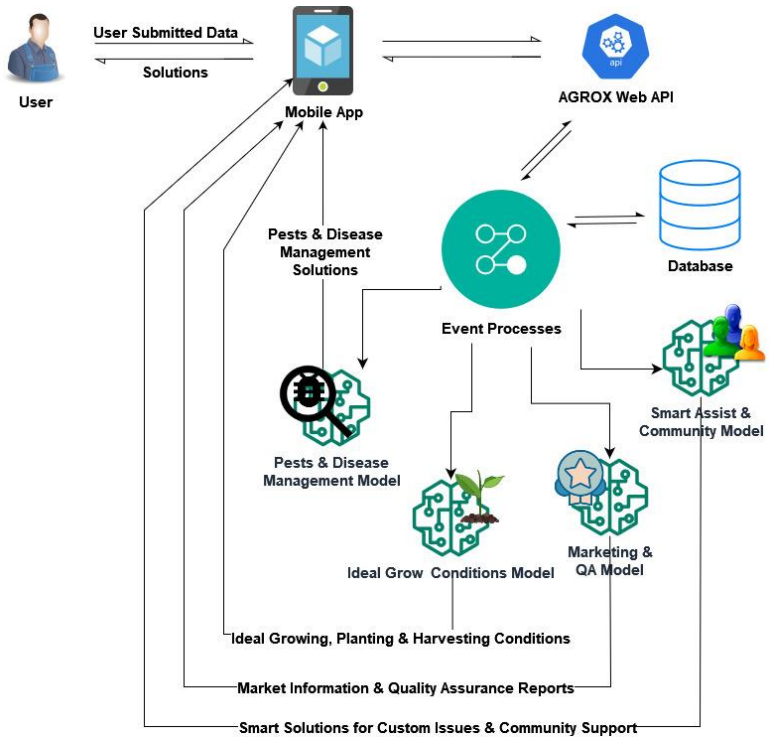
[3] V. Nayak, P. R. Nayak, N. Sampoorna, A. Aishwarya, and N. H. Sowmya, "Agroxpert - Farmer assistant," in Global Transitions Proceedings, vol. 2, no. 2, 2021, pp. 506-512, ISSN 2666-285X, doi: 10.1016/j.gltp.2021.08.016.

7. Brief description of the nature of the solution including a conceptual diagram (250 words max)

The AGROX app is a comprehensive solution designed to provide guidance and support to individuals and organizations involved in the cinnamon industry. The app offers a range of information on various aspects of cinnamon cultivation, such as ideal growing conditions, planting and harvesting procedures, pest (specifically, Cinnamon butterfly) and disease management (more specifically, rough bark disease), market information, and quality assurance support. Additionally, the AGROX app includes a community platform and a trained bot to provide additional support to cinnamon cultivators.

The community platform provides a space for cinnamon cultivators to connect, share their experiences, and ask for advice from more experienced individuals. The trained virtual assistant can assist with answering questions and providing information on a variety of topics related to cinnamon cultivation, including the early and accurate diagnosis of rough bark disease. The inclusion of real-time weather forecasts in the app can help cinnamon cultivators make informed decisions about when to care for their plants, optimizing the growth and productivity of their crops.

Overall, the AGROX app provides a comprehensive solution to the challenges faced by cinnamon cultivators, helping to ensure their success and promote the growth of the cinnamon industry.



8. Brief description of specialized domain expertise, knowledge, and data requirements (300 words max)

The suggested solution incorporates significant components from machine learning, deep learning, data analysis, and mobile and web development. It is intended that Flutter and Node.js will be used to implement the final web application. In contrast, Python and its associated libraries will be used to develop the backend.

User feedback will be handled through a virtual assistant. Users can submit their questions for the features that are not covered by the application. These questions will be shared into a live questions and answers forum. Any user is allowed to ask and answer existing questions. Users can like and dislike questions and answers based on how effective they are. These questions and answers will be regularly injected into a knowledge base. The virtual assistant will analyze the question using Sentiment Analysis when one is presented and will provide the most suitable answers from the knowledge base.

It is necessary to possess text summarization datasets, and image-to-text datasets to put the solution into action. Researched and collected data of the agricultural department of Sri Lanka were obtained for our usage of the research project. After that, some datasets were manually created utilizing the information from the agricultural experts to validate and train the data of our project.

9. Objectives and Novelty

Main Objective:
In this research study, we are developing a mobile application for the Cinnamon industry to provide functionalities to guide through ideal growing conditions, planting and harvesting procedures, pests and disease management, market and quality assurance, and a platform and a trained virtual assistant for additional support. This application is for beginners to expert-level industrial personnel and anyone who seeks knowledge.

Member Name	Sub Objective	Tasks	Novelty
Ravishan S.A.A.	Provide accurate information on current market status and provide quality assurance to products using machine learning technology.	• Receive and analyze results from the static data of the market. • Research and gather information on the quality with current condition. • Provide a comprehensive and accurate information for the cinnamon market status. • Continuously monitor the market and gather information as necessary.	There is few research done on cinnamon planting and disease identification, even so there cannot be found any applications focusing on this specific area of subject. So, we are focusing to develop an API to auto training the ML Model for the cinnamon market information and quality assurance by using data that the admin updated.
Edirisinghe B.M.	Plant Status Analysis and diagnose deficiencies and diseases through computer vision.	• Take pictures or videos of the plants and upload them to the application for analysis. • Review the results of the computer vision analysis and	Research projects done so far have not been focused on cinnamon butterfly and rough bark disease which are massive threats to

		diagnose any deficiencies or diseases present in the plants. • Identify the cause of the problem and research potential solutions. • Provide recommendations for addressing the deficiencies or diseases, including any necessary treatments or adjustments to the care routine. • Monitor the progress of the plants and adjust the recommendations as needed	cinnamon plants. Filling up a research gap where there are no such support and guidance for cinnamon industry.
Gamaethige G.G.S.A.	Community platform and trained virtual assistant for additional on queries using artificial intelligence and deep learning.	• Enter descriptions or queries regarding any doubts or questions about the health of the plants. • Receive information and solutions to address the doubts raised, based on the information provided in the text input. • Implement the recommended solutions and monitor the progress of the plants. • Continuously update the information and ask for clarification, if necessary, to ensure the health of the plants.	There are no such apps that only focus on cinnamon planting and maintaining support system. We are mainly focusing on the prevention of the cinnamon farmers practical problems by using an API working with Auto Training ML Model.

Ekanayaka E.M.A.I.B.	Maintain healthy plants and optimize their harvest. Its task generation feature is seen as a helpful tool for planters, as it offers specific tasks and recommendations aimed at maximizing yields and making the most of their efforts using computer vision technology.	• Monitor plant health and identify any potential issues. • Follow the recommended tasks and recommendations provided by the task generation feature. • Implement the suggested methods for optimizing the harvest. • Continuously track the progress of the plants and adjust as necessary. • Utilize the application to make informed decisions regarding the care and maintenance of the plants.	There is few research done on cinnamon planting and disease identification, even so there cannot be found any applications focusing on this specific area of subject, so we are focusing on how to maintain a baby nursery step prevent diseases beforehand by step with current plant and environment conditions.

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Topic Assessment Form

10. Supervisor checklist (supervisors should fill sections 10 and 11)

a) Is this research problem valid?

Yes	✓	No	

b) Is the proposed research group correct?

Yes	✓	No	

c) Is the proposed research area correct?

Yes	✓	No	

d) Do the proposed sub-objectives match the students' specialization?

Yes	✓	No	

e) Is the required domain expertise, knowledge, and the data available either through the supervisor or external supervisor?

Yes	✓	No	

f) Is the scope of the solution practical?

Yes	✓	No	

g) Do all sub-objectives have sufficient novelty?

Yes	✓	No	

11. Supervisor details

	Title	First Name	Last Name	Signature
Supervisor	Prof.	Koliya	Pulasinghe	10/02/2023
Co-Supervisor	Dr.	Dharshana	Kasthurirathna	
External Supervisor	Ms.	Thara	Madhurangi	

Summary of external supervisor's (if any) experience and expertise

Expertise in Cinnamon diseases and Assistant Director (research) agriculture.

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Topic Assessment Form

Summary Sheet

The topic evaluation panel will use the summary sheet to evaluate the suitability of the project

1. Brief description of research problem including references (200 – 300 words max)

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In conclusion, AGROX is a game-changer for the cinnamon industry. Its comprehensive approach to growing conditions, pest and disease management, market information, and support, make it a valuable tool for cinnamon planters. The application's commitment to accuracy and reliability sets it apart from traditional methods, providing a more trustworthy source of information for the industry.

2. Brief description of the nature of the solution (150 words max)

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Edirisinghe B.M	Plant Status Analysis and diagnose diseases through computer vision.	• Uploading images of the plants and upload them to the application for analysis. • Review the results of the computer vision analysis and	Research projects done so far have not been focused on cinnamon butterfly and rough bark disease which are massive threats to cinnamon plants. Filling up a research gap where

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Topic Assessment Form

<u>This part to be filled by the Topic Screening Panel members.</u>

Acceptable: Mark/Select as necessary

Topic Assessment Accepted	
Topic Assessment Accepted with minor changes (should be followed up by the supervisor) *	
Topic Assessment to be Resubmitted with major changes*	
Topic Assessment Rejected. Topic must be changed	

* Detailed comments given below

Comments

The Review Panel Details

Member's Name	Signature

Important:

1. According to the comments given by the panel, do the necessary modifications and get the approval by the **Supervisor** or the **Same Panel**.
2. If the project topic is rejected, identify a new topic, and request the RP Team for a new topic assessment.
3. The form approved by the panel must be attached to the **Project Charter Form**.