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|  | **Sri Lanka Institute of Information Technology** |



PROJECT REGISTRATION FORM

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(This form should be completed and uploaded to the Cloud space on or before XXXXXXXXX)

The purpose of this form is to allow final-year students of the B.Sc. (Hon) degree program to enlist in the final-year project group. Enlisting in a project entails specifying the project title and the details of four members in the group, the internal supervisor (compulsory), the external supervisor (may be from the industry), and indicating a brief description of the project. The description of the project entered on this form will not be considered as the formal project proposal. It should however indicate the scope of the project and provide the main potential outcome.

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| PROJECT TITLE(As per the accepted Topic Assessment Form) | Smart System for Optimized Organic Crop Rotation Using Precision Agriculture Data. |

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| RESEARCH GROUP (As per the Topic Assessment Form) | Select Research Group  |

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| PROJECT NUMBER |  23-113  | (Will be assigned by the RP Team) |

PROJECT GROUP MEMBER DETAILS: (Please start with the group leader’s details)

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| --- | --- | --- | --- | --- |
|  | **STUDENT NAME** | **STUDENT NO.** | **CONTACT NO.** | **EMAIL ADDRESS** |
| 1 | Ranasinghe R A D M  | IT20244552 | 0774020028 | it20244552@my.sliit.lk |
| 2 | Samarakoon S M A D | IT20233808 | 0765851400 | it20233808@my.sliit.lk |
| 3 | Ihalagedara I H U B | IT20224820 | 0714209024 | it20224820@my.sliit.lk |
| 4 | Waththaladeniya N M | IT20151874 | 0767474152 | it20151874@my.sliit.lk |

**SUPERVISOR, CO\_ SUPERVISOR Details**

|  |  |
| --- | --- |
| **SUPERVISOR Name** | **CO-SUPERVISOR Name** |
| Mr Udara Samaratunge | Dr Nuwan Kodagoda |
| **Signature** | **Signature** |
| **Appendix 1** | **Appendix 2** |
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| EXTERNAL SUPERVISOR Details (if any, may be from the industry) |
|  |  |  |  | **Attach the email as Appendix 3** |
| Name | Affiliation | Contact Address | Contact Numbers | Signature/Date |
| Imi Hamilage Dissanayake | Former Assistant Director (Project)National Program on Food Production (Organic) | Temple Road Pothuhera | 0713281675 | A picture containing text, whiteboard  Description automatically generated |

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| ACCEPTANCE BY CDAP MEMBER (This part will be filled by the RP team) |
|  |  |  |
| Name | Signature | Date |
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PROJECT DETAILS

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| Brief Description of your Research Problem: (extract from the topic assessment form) |
| Problem Statement: Despite the growing demand for sustainable and productive agriculturalsystems (Organic farming), there are still various challenges faced by the agricultural sector,including soil health and fertility issues, pest and disease management, climate-resilientorganic farming practices, and the need to enhance crop yields and diversity. The existingcrop rotation planning solutions do not adequately address these challenges and provide.comprehensive plans that consider the critical importance of soil health and fertility, pestand disease management without harmful chemicals, and the impact of climate change onagriculture.Research Gap: The existing literature lacks a comprehensive software solution that considers.the various challenges faced by the agricultural sector and provided a crop rotation plan thataddresses soil health and fertility, pest and disease management, climate-resilient organicfarming practices, and crop yield and diversity enhancement. Moreover, there is a need forinnovative and cutting-edge software solutions that contribute to the development ofsustainable and productive agricultural systems.References:Food and Agriculture Organization of the United Nations (FAO). (2020). SustainableAgriculture and Food Systems. Retrieved from <https://www.fao.org/sustainableagriculture/en/>United States Department of Agriculture (USDA). (2020). Sustainable Agriculture. Retrievedfrom <https://www.usda.gov/topics/sustainable-agriculture>Thorne, P., Joffe, H., Stirling, A., & Brown, K. (2018). Climate change, food security andsustainable agriculture: a framework for analysis. Environmental Science & Policy, 81, 52-61.doi:10.1016/j.envsci.2017.11.005Magrini, L., Bues, A., & Govaerts, B. (2017). Sustainable agriculture and food security:interconnections and challenges. Sustainability, 9(7), 1232. doi:10.3390/su9071232. |

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| Main expected outcomes of the project: (extract from the topic assessment form) |
| A solution to the challenge of creating an effective crop rotation plan in organic agriculture involves creating a software engineering-based approach. This approach leverages the latest advancements in software engineering to incorporate the principles of organic farming and address the critical factors affecting soil health and fertility, pest and disease management, climate resilience, and crop yield and diversity. The software engineering-based approach will enable the development of a comprehensive crop rotation plan that considers all the relevant factors, ensuring soil health and fertility are maintained, pests and diseases are managed without harmful chemicals, the farming practices are resilient to climate change, and crop yields and diversity are increased. The outcome of this approach will be a comprehensive crop rotation plan that will contribute to the sustainable and productive growth of organic agricultural systems, benefiting both farmers and the environment. |

WORKLOAD ALLOCATION (**extract from the topic assessment form after correcting the suggestions given by the topic assessment panel.**)

(Please provide a brief description of the workload allocation)

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| MEMBER 1  | Ranasinghe R A D MIT20244552 |
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| Objective | Tasks |
| **create and optimize crop rotation plans in organic agriculture using gathered data from precision agriculture tools.** | * Data Collection - gathering information from other components.
* Data Preprocessing - cleaning and organizing data for analysis.
* Data Analysis - analyzing data with machine learning algorithms to understand relationships between factors affecting crop growth.
* Model Development - creating a predictive model to optimize crop rotation plans.
* Implementation -deploying the solution in a usable form, e.g. standalone application, cloud service, or integration into an existing system
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| MEMBER 2  | Samarakoon S M A DIT20233808 |
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| Objective | Tasks |
| **Finding the composition of a given soil sample and process the data to provide meaningful information** | * Find the chemical elements that can be found on a given soil sample using an IOT device or using AR technology
* Process and compare the data with the knowledge base to provide analytics
* Process and compare the data with the knowledge base to provide information about the crop rotation plan to the end-user
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| MEMBER 3  | Ihalagedara I.H.U.B IT20224820……………………………………………………………………………………………………………………………………………………… |
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| Objective | Tasks |
| **Finding crop diseases based on the images provided and providing information and instructions for the future crops and crop rotation.** | * Providing the ability to identify crop diseases for the farmers with images with cloud computing and custom vision.
* Compare the current crop diseases and provide meaningful ways and instruction to get rid of the diseases with the knowledge-based approach.
* Provide meaningful instructions for the future crops for sustainable growth based on the analytics.
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| MEMBER 4  | Waththaladeniya N.M. IT20151874………………………………………………………………………………………………………………………………………………………… |
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| Objective | Tasks |
| Finding local varying weather conditions like temperature, precipitation, humidity, wind, and extreme weather conditions to provide farmers with real-time recommendations to help them mitigate the impacts of changing weather conditions on their organic crops and to distribute gathered data to create the crop rotation. | * Data collection and analysis: Collecting and analyzing data on weather variables, crop yields, and other relevant information to determine the impact of weather conditions on crops.
* Model development: Developing agro- meteorological models that can simulate the growth and development of crops in response to changing weather conditions
* User interface design: Designing a user- friendly interface for the software that is accessible and easy to use for farmers.
* Integration with GIS: Integrating GIS technologies into the software to provide farmers with maps and satellite imagery that can be used to monitor and analyze the impact of changing weather conditions on their crops.
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DECLARATION (Students should add the Digital Signature)

“We declare that the project would involve material prepared by the Group members and that it would not fully or partially incorporate any material prepared by other persons for a fee or free of charge or that it would include material previously submitted by a candidate for a Degree or Diploma in any other University or Institute of Higher Learning and that, to the best of our knowledge and belief, it would not incorporate any material previously published or written by another person in relation to another project except with prior written approval from the supervisor and/or the coordinator of such project and that such unauthorized reproductions will construe offences punishable under the SLIIT Regulations.

We are aware, that if we are found guilty for the above mentioned offences or any project related plagiarism, the SLIIT has right to suspend the project at any time and or to suspend us from the examination and or from the Institution for minimum period of one year”.

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|  | **STUDENT NAME** | **STUDENT NO.** | **Signature** |
| 1 | Ranasinghe R A D M  | IT20244552 | Text, letter  Description automatically generated |
| 2 | Samarakoon S M A D | IT20233808 | Text, letter  Description automatically generated |
| 3 | Ihalagedara I H U B | IT20224820 |  |
| 4 | Waththaladeniya N M | IT20151874 | A whiteboard with writing on it  Description automatically generated with low confidence |

Appendix 1 :

Appendix 2 :