CLBSCSD2611_ST20284589_FINAL_PRES.pptx

by Walpitage Sahan Dinuka

Submission date: 07-May-2024 11:36AM (UTC+0100)
Submission ID: 232340218
File name: 126762_Walpitage_Sahan_Dinuka_CLBSCSD2611_ST20284589_FINAL_PRES_2154676_1802006634.pptx (5.05M)
Word count: 900
Character count: 5548

Plant Cultivation and Monitoring Solution using IOT and ML

PROBLEM STATEMENT

Sri Lanka's agricultural sector has seen limited progress since independence, lagging notably behind other nations that have embraced modern technologies like the Internet of Things (IoT) and Machine Learning (ML). While these advancements have revolutionized farming globally, increasing production and efficiency, their adoption in Sri Lanka remains minimal.

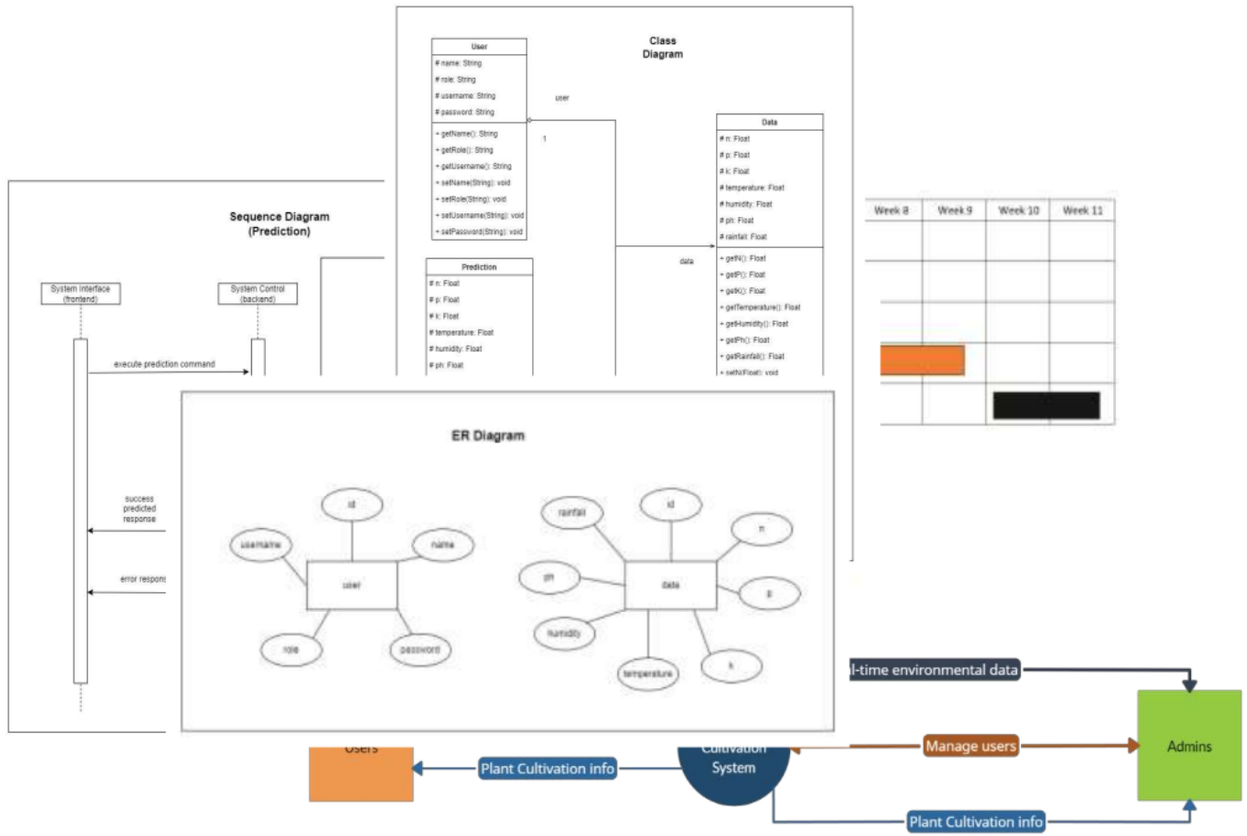
Technological Gap

There's a significant absence of advanced technologies such as IoT and ML in the local agricultural practices.

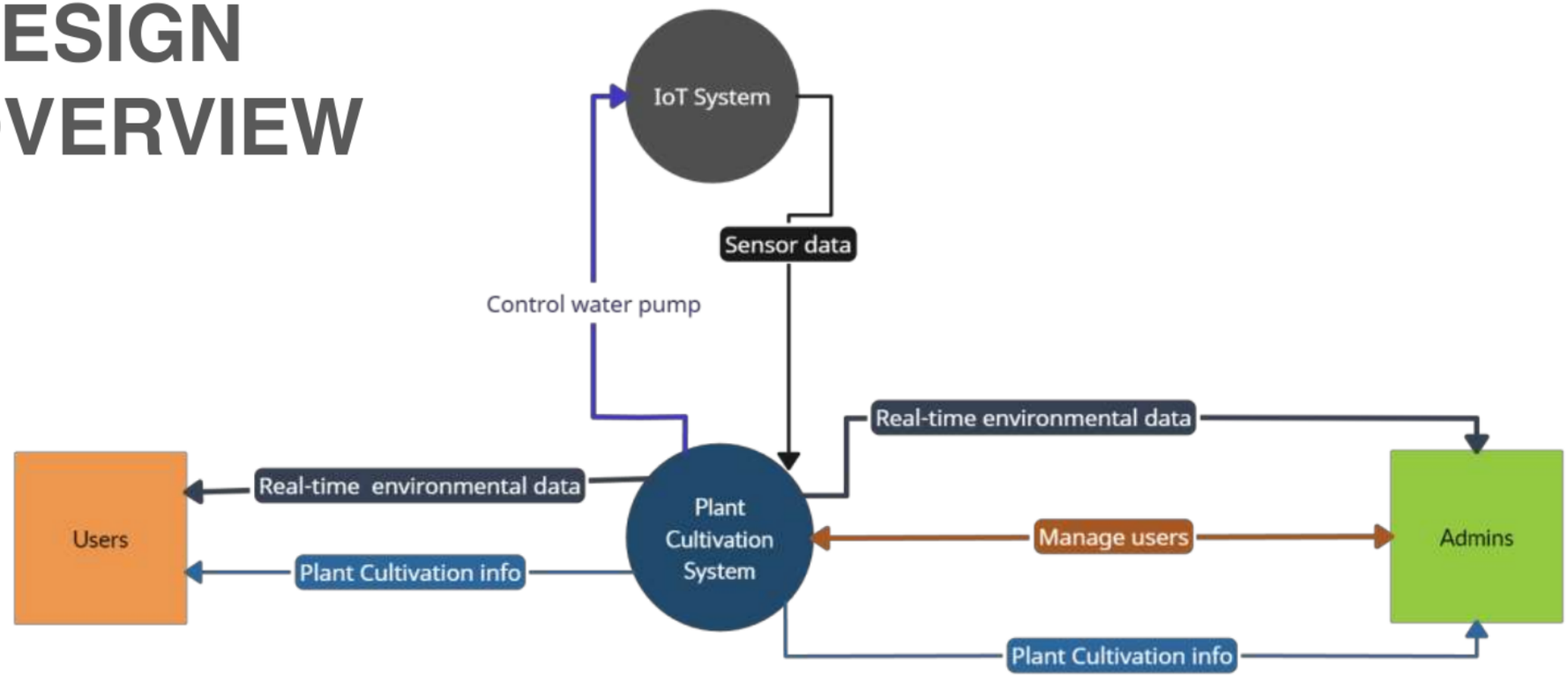
Geographical and Climatic Diversity

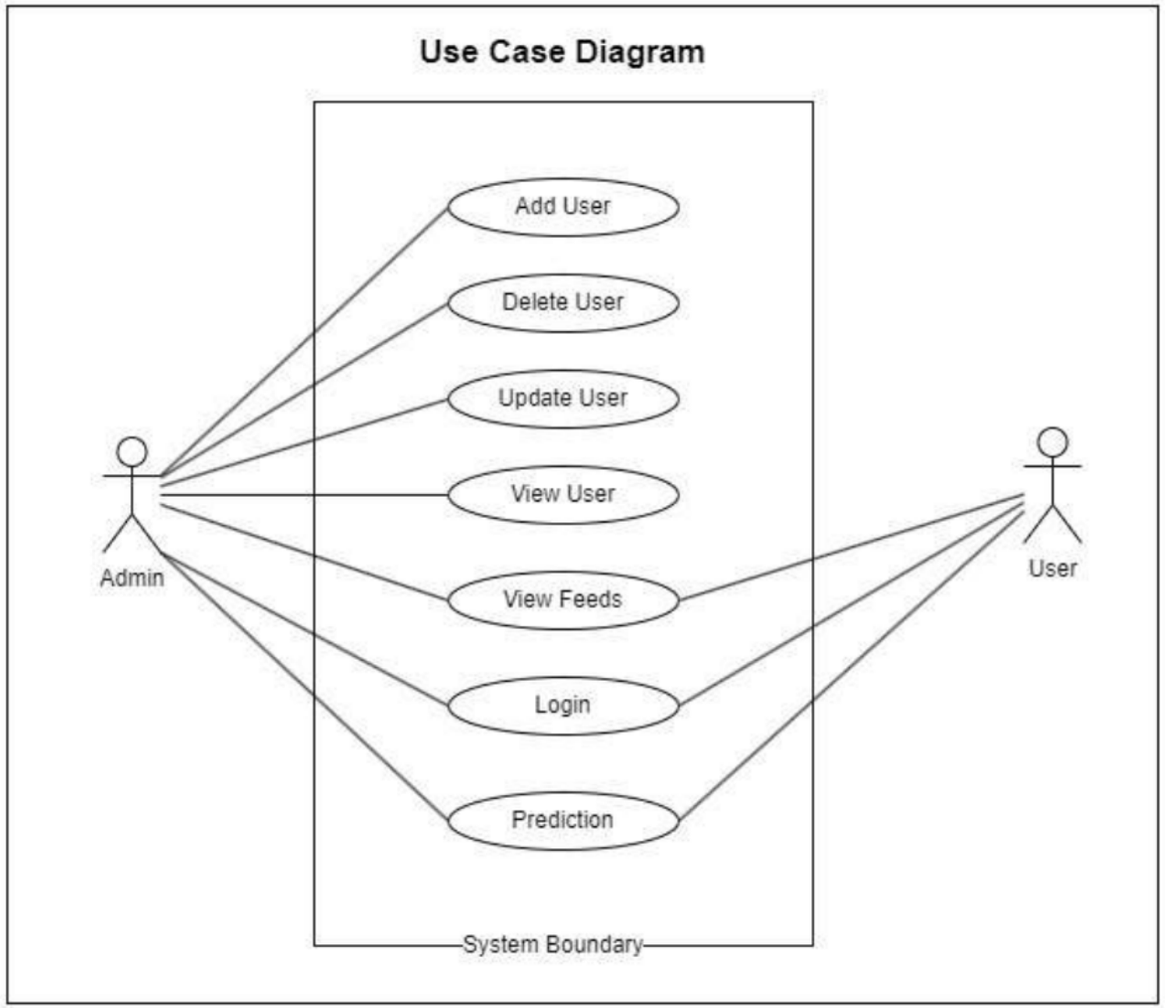
Sri Lanka's diverse agricultural landscape, varying widely across different regions in climate and geography, poses a unique challenge. The Central Province and the North Central Province, for example, differ greatly in temperature and precipitation, affecting what crops can feasibly be cultivated.

SYSTEM DIAGRAMS



DESIGN OVERVIEW

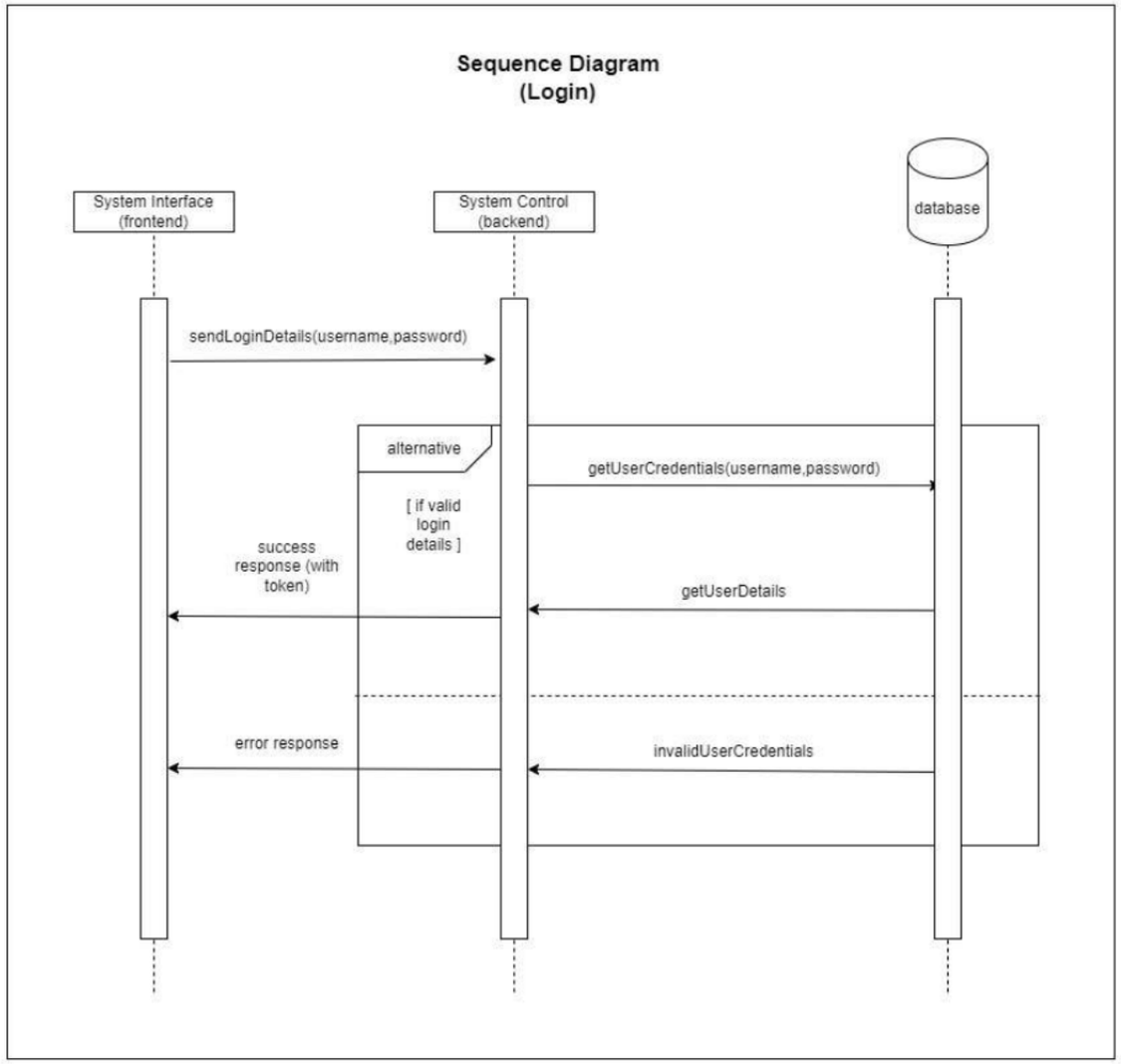


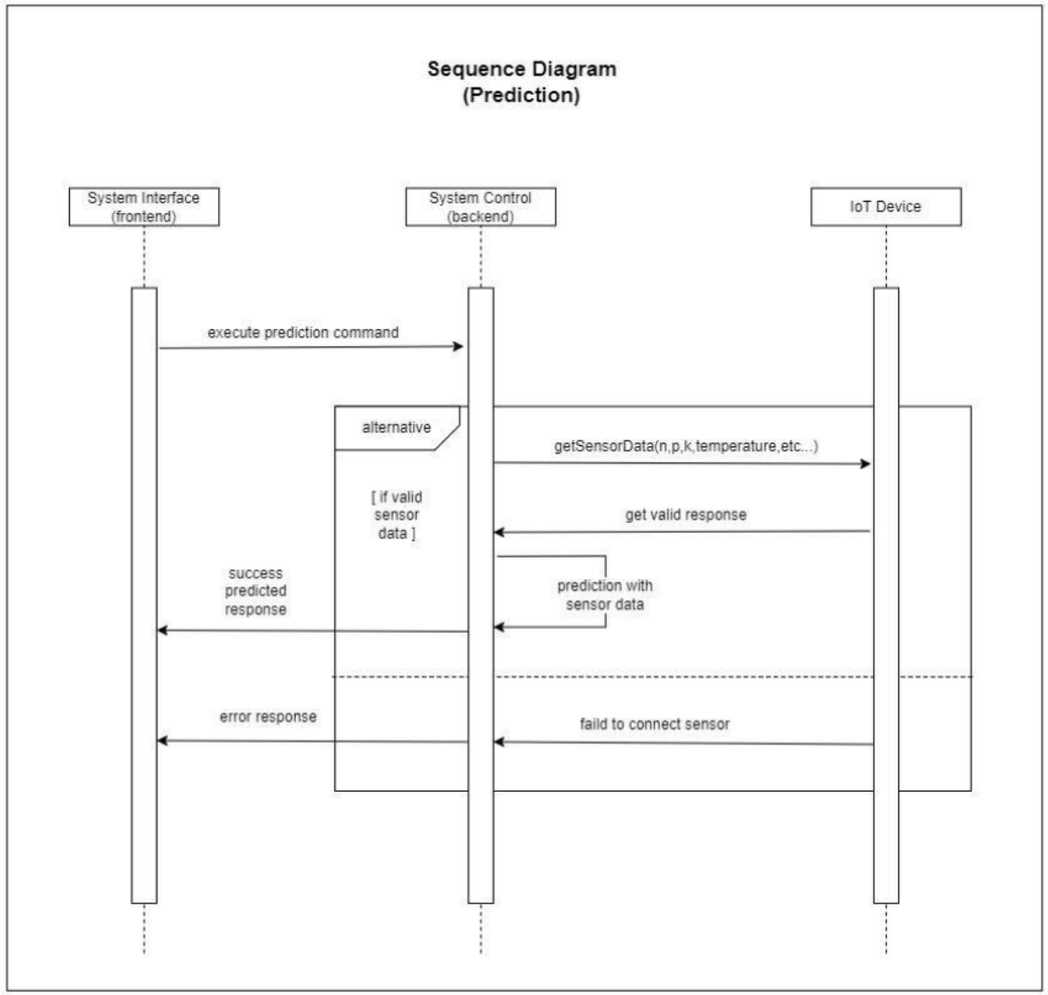


USE CASE DIAGRAM

SEQUENCE DIAGRAM

(Login)

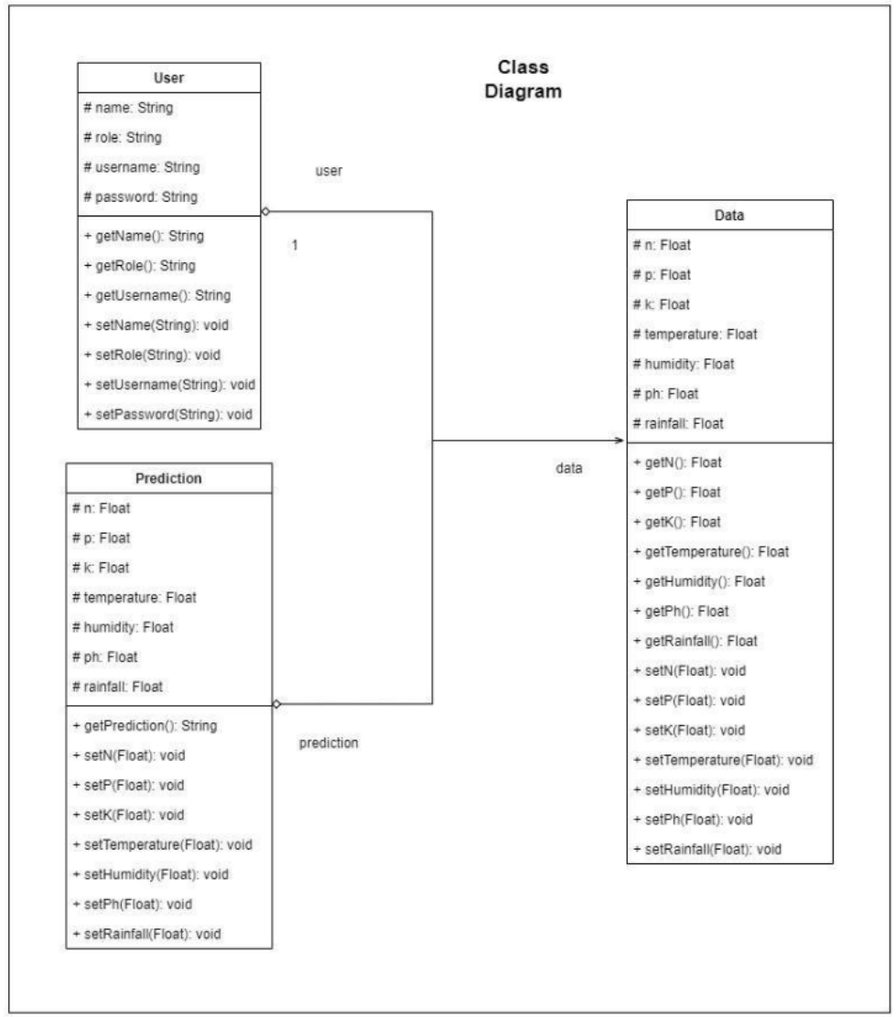




SEQUENCE DIAGRAM

(Prediction)

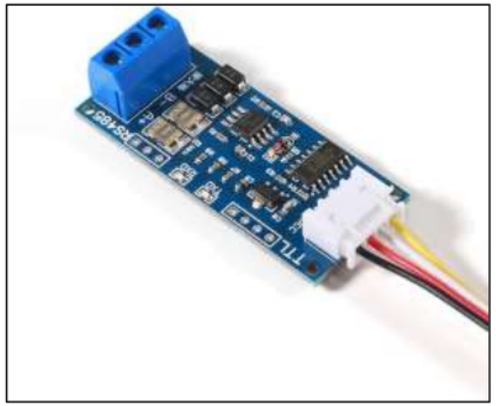
CLASS DIAGRAM



IOT DEVICE COMPONENTS

NodeMCU V3 Wi-Fi
Development Board

Soil Moisture, Temperature,
Humidity, PH, NPK Sensor



TTL to RS485 Adapter

LITERATURE REVIEW

literature review delves into the current state of IoT and Machine Learning applications within the agricultural sector. It compiles insights from various studies that demonstrate how these technologies have revolutionized farming worldwide. This includes enhancements in predictive analytics for crop yields, optimized resource management, and advanced environmental monitoring. Also explore the specific barriers and breakthroughs in technology adoption across different agricultural settings, focusing on how these innovations can be tailored to Sri Lanka's unique agricultural conditions. This comprehensive analysis establishes a robust foundation for understanding how IoT and ML can significantly contribute to advancing agricultural practices, supporting the innovative approaches proposed in the project.

LITERATURE REVIEW

Dependent Variable

Best Plant (label)

Independent Variable

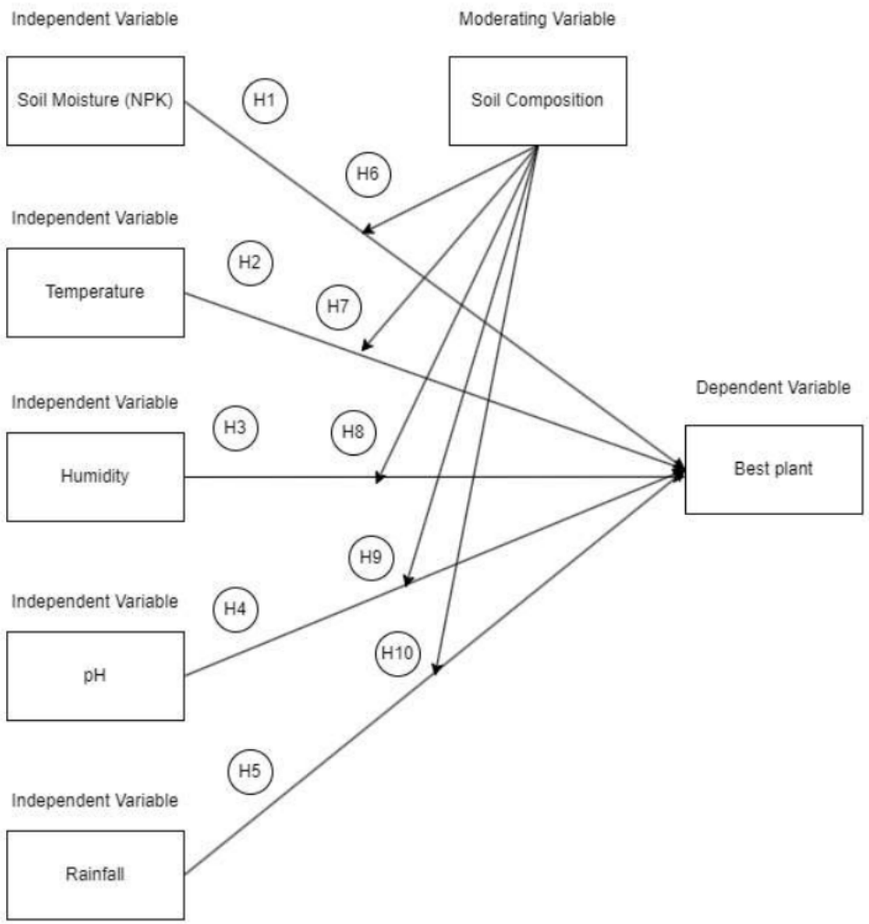
Soil Moisture (NPK)

Temperature

Humidity

Ph

Rainfall



CONCEPTUAL DIAGRAM

This conceptual diagram illustrates framework for leveraging advanced technologies in agriculture. It begins with environmental and soil data as inputs, gathered via IoT sensors, which are then processed through our machine learning system. The outcome is precise predictions of optimal crop choices, tailored to the specific climatic and geographical characteristics of different regions in Sri Lanka, aiming to enhance agricultural efficiency and diversity.

RESEARCH ANALYSIS

The Research Analysis section of the presentation scrutinizes the data collected from IoT sensors and analysed through the machine learning models. This section evaluates the effectiveness of integrating advanced technologies into Sri Lankan agriculture, assessing their impact on crop selection and cultivation efficiency. Systematically analyse the patterns and outcomes derived from our predictive models to determine the most suitable crops for various regions, considering local environmental and soil conditions. This analysis not only validates hypothesis but also demonstrates the potential of IoT and ML to enhance agricultural productivity and sustainability in Sri Lanka.

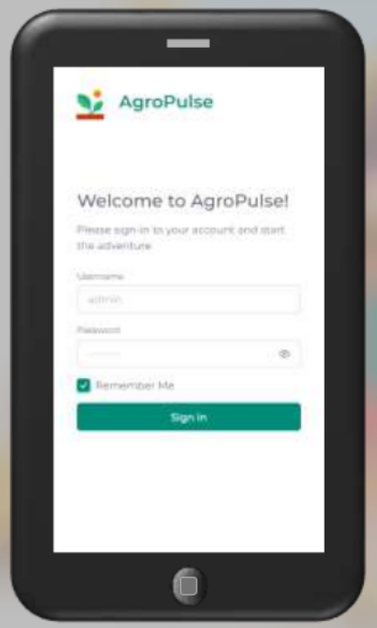
Data Insights

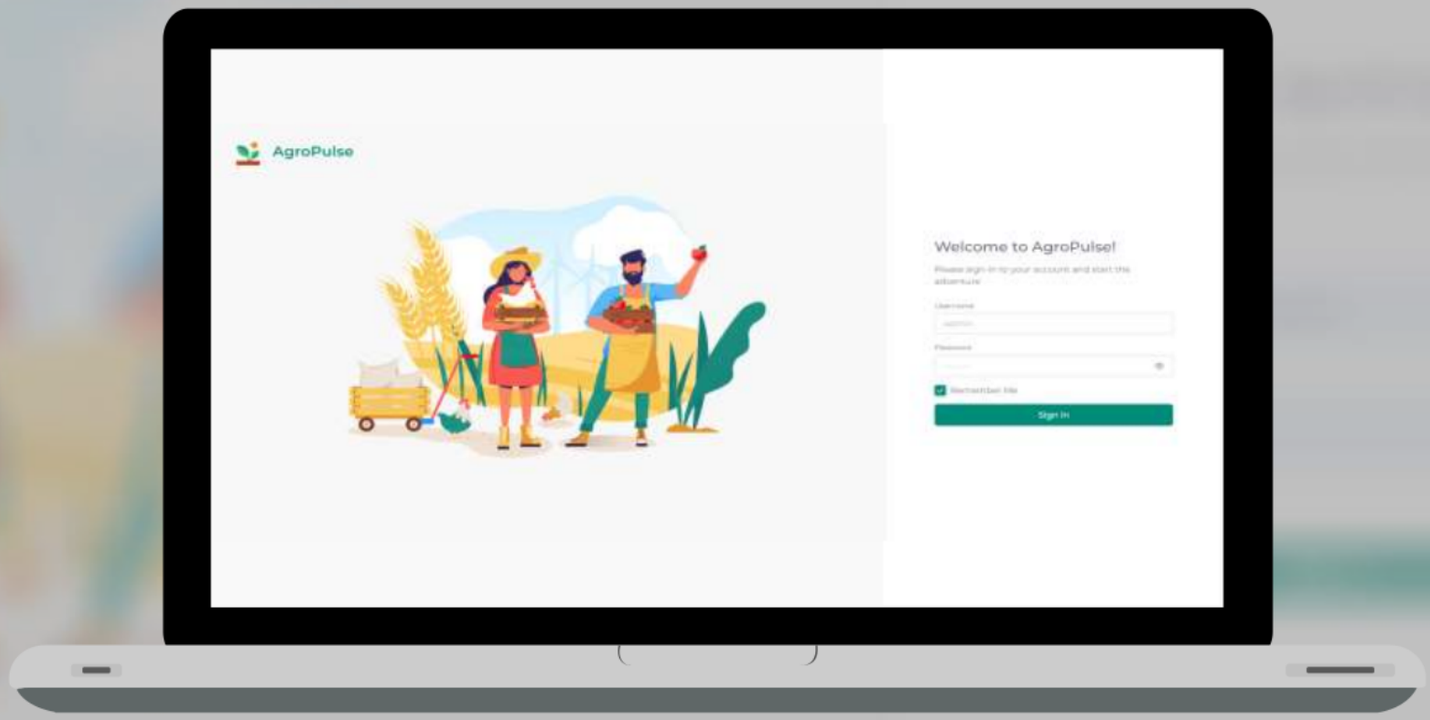
Present significant patterns and insights discovered through the analysis of IoT data

Model Performance

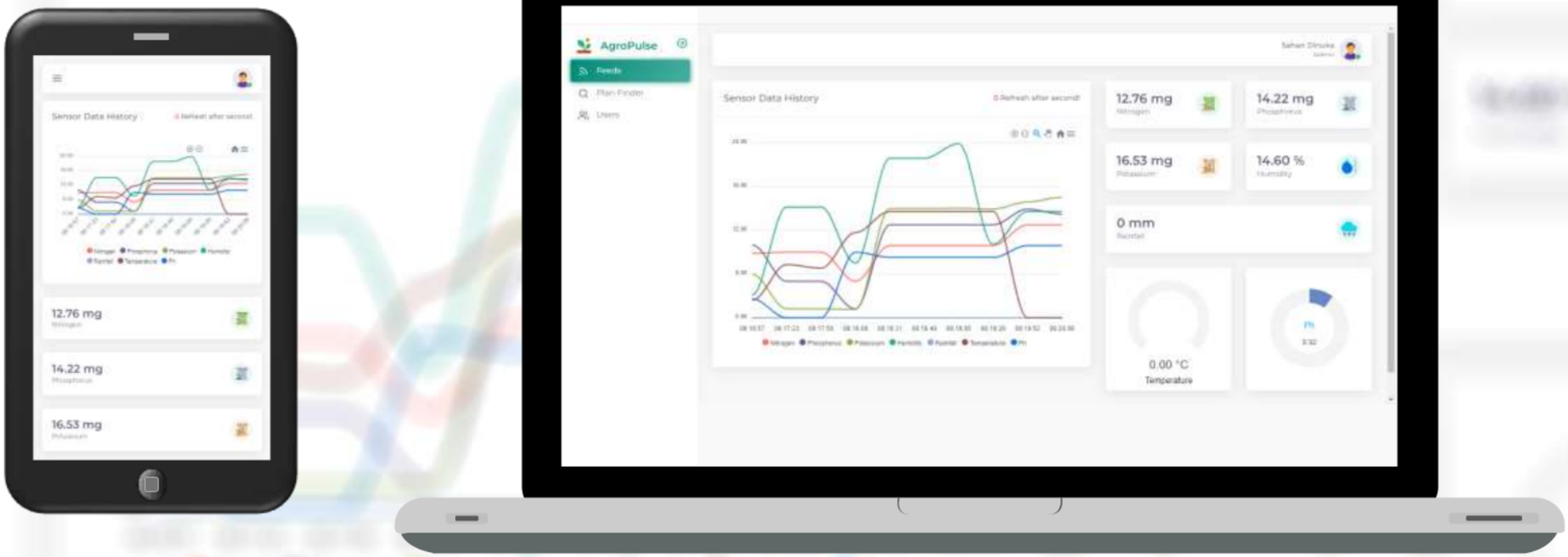
Share results regarding the accuracy and reliability of the machine learning models.

DESIGN (Login)

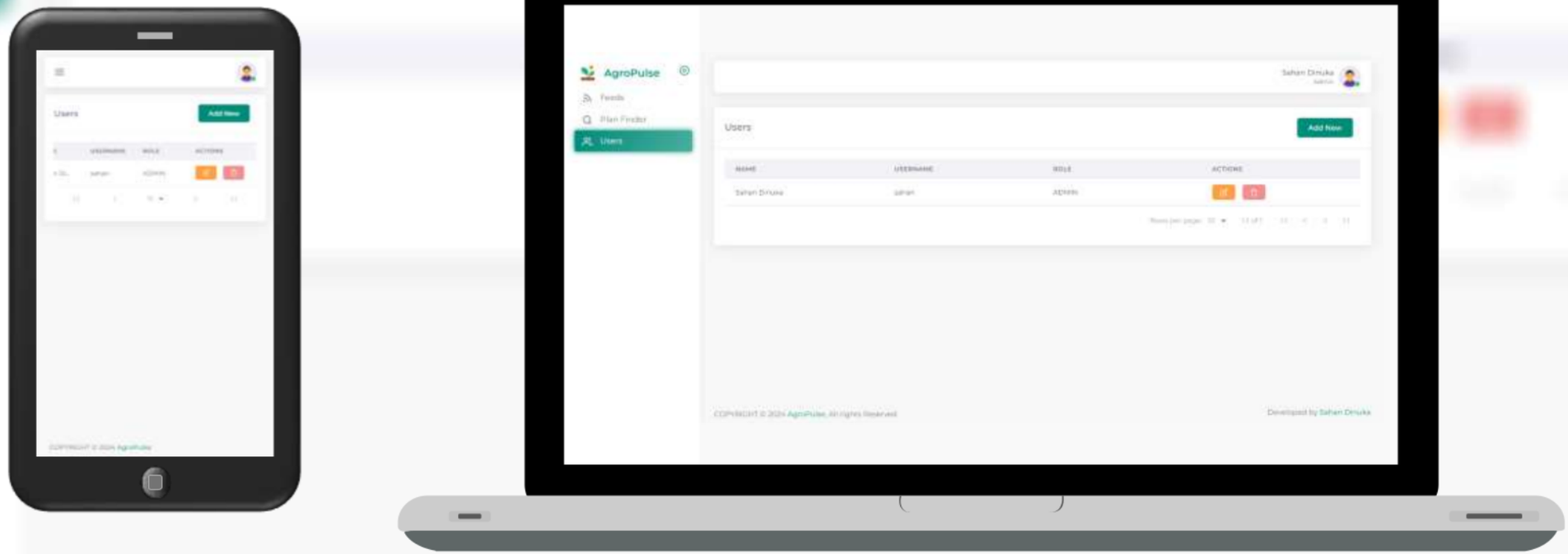




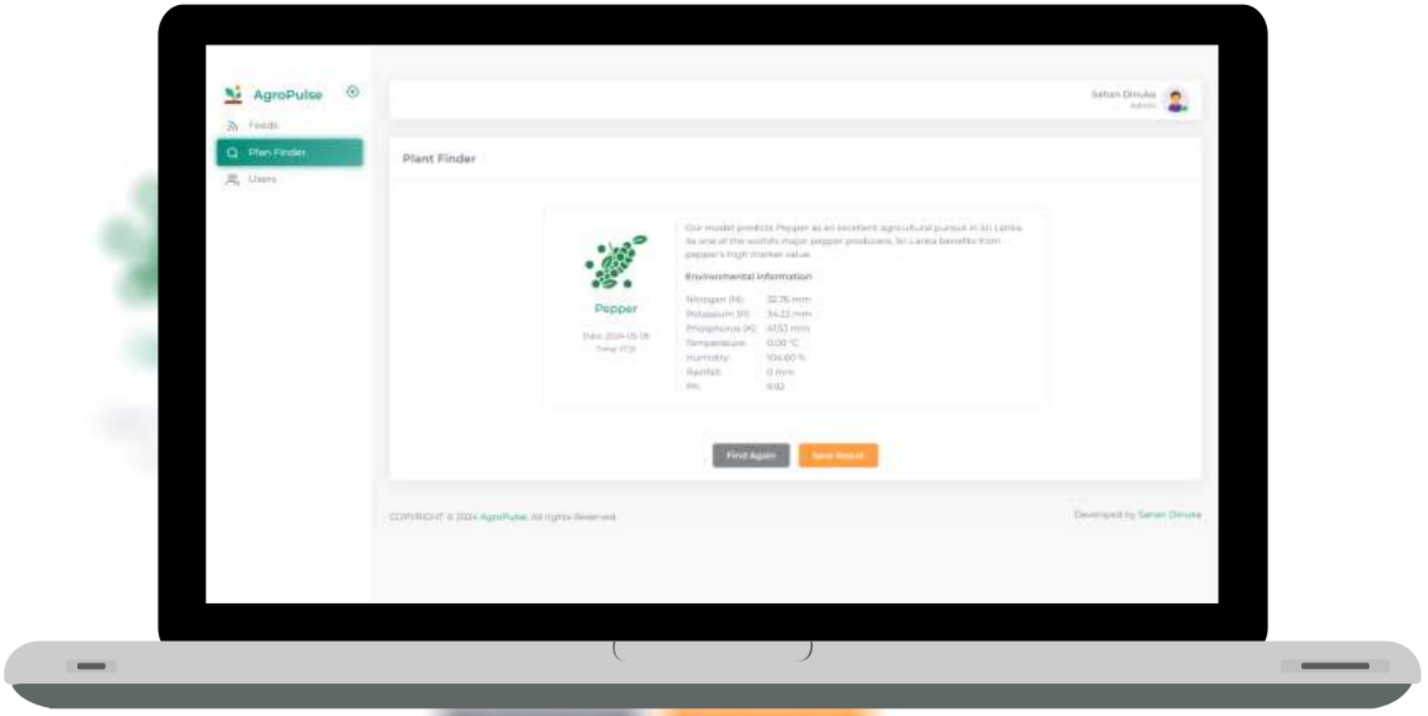
DESIGN (Dashboard)



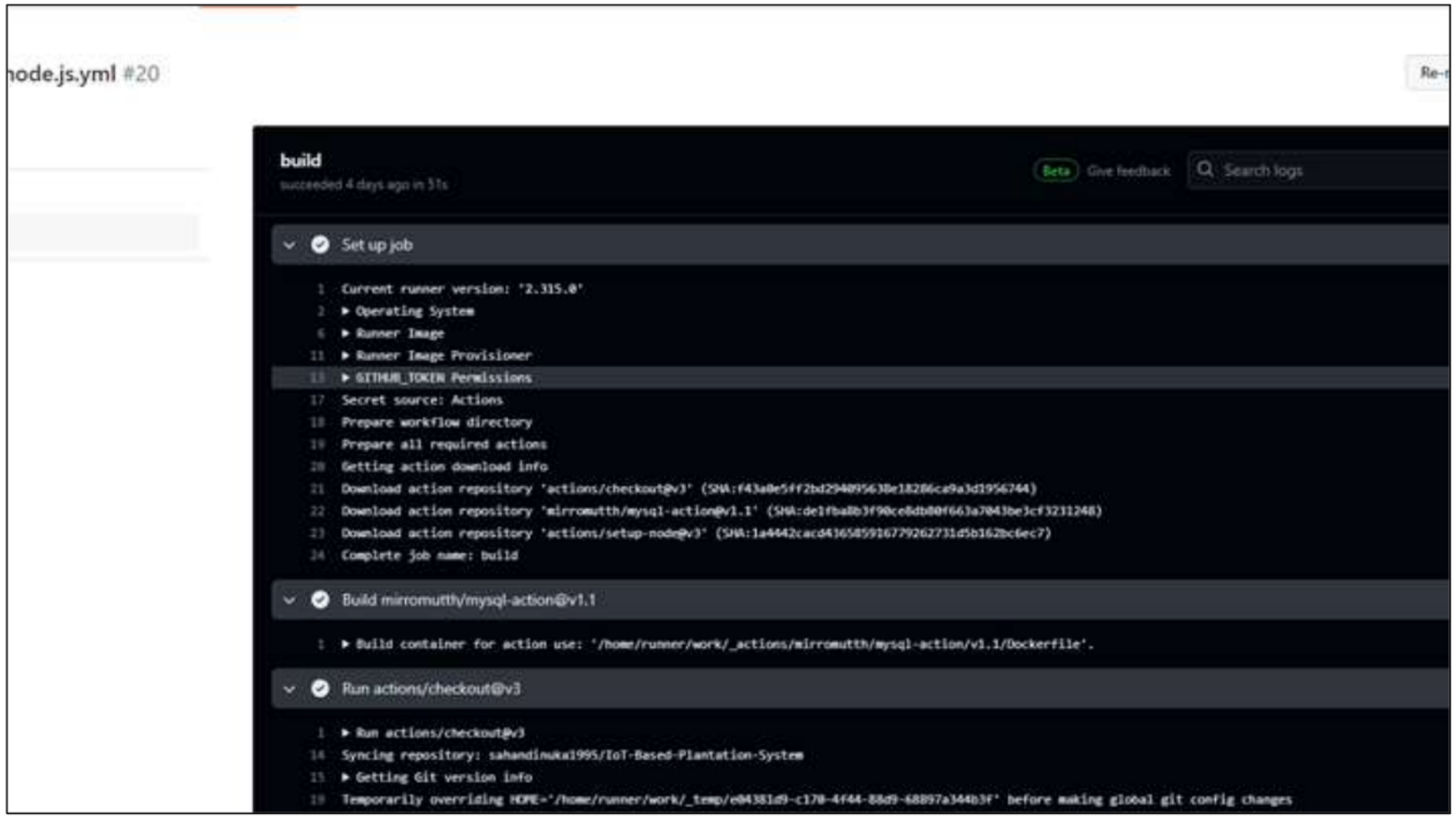
DESIGN (Users)



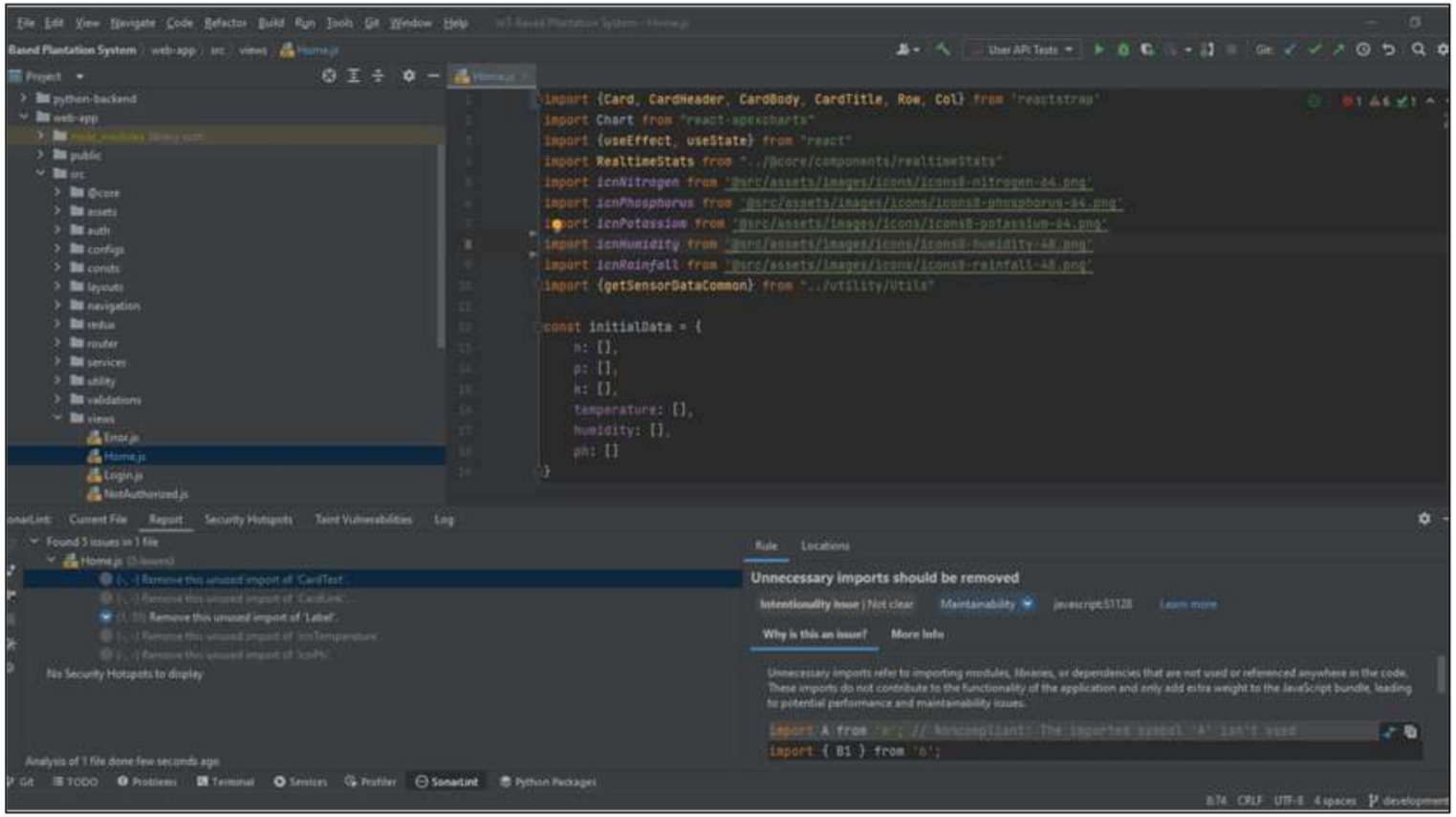
DESIGN (Prediction)



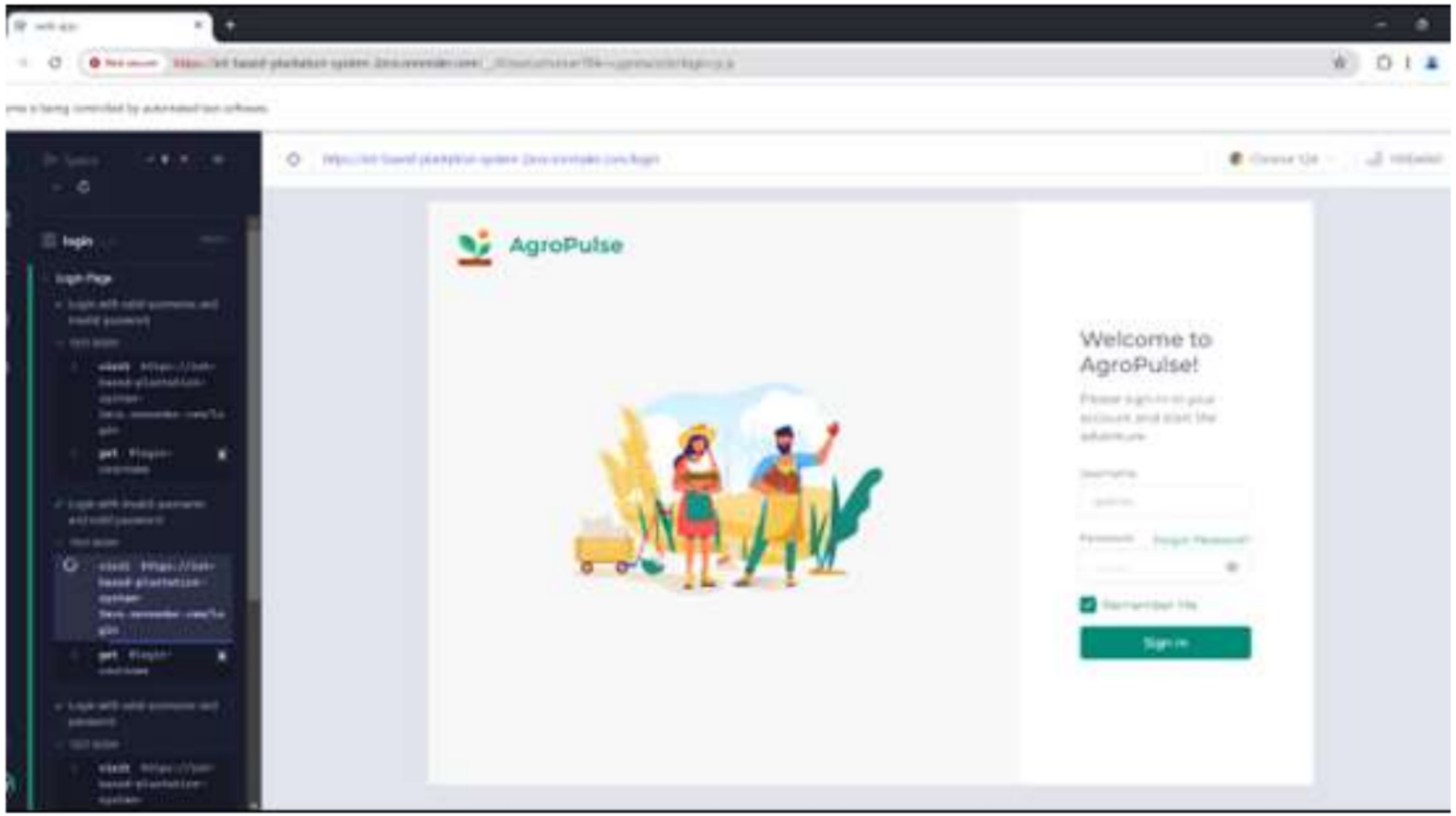
GITH ACTION TEST RESULTS



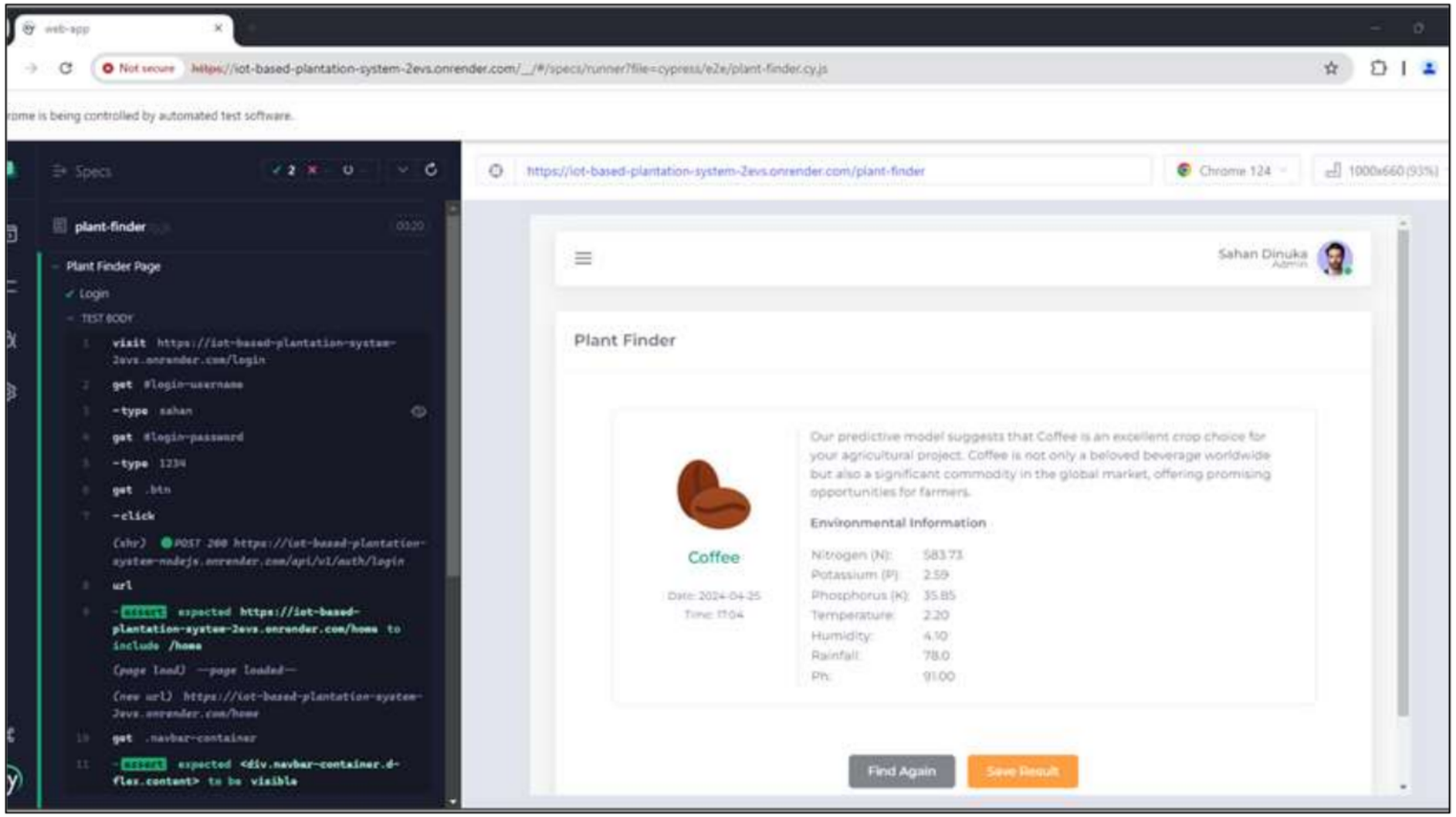
SONARLINT CODE QUALITY TEST

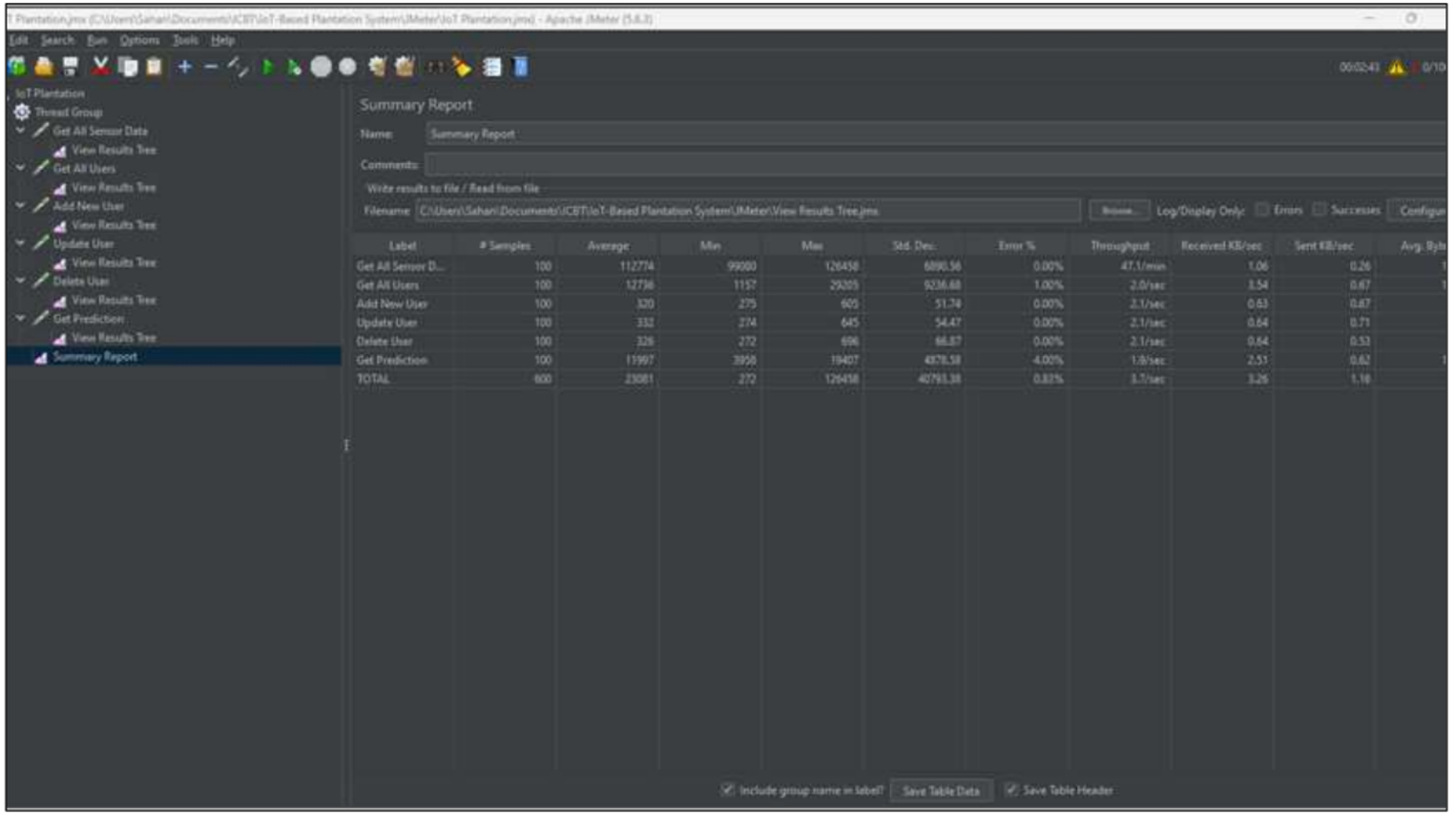


UI AUTOMATION TEST RESULT



UI AUTOMATION TEST RESULT





LOAD & PERFORMANCE TEST RESULT

CONCLUSION

This research demonstrated that the integration of Internet of Things (IoT) and Machine Learning (ML) technologies can significantly enhance crop selection processes and overall agricultural productivity in Sri Lanka.

The application of these technologies enabled precise monitoring and analysis of environmental and soil conditions, leading to more informed and effective farming decisions.

By adapting agriculture to technological advancements, Sri Lanka can improve food security, increase export opportunities, and bolster the national economy.

REFERENCES

1) AbdelRahman, M. A. E., Saleh, A. M., & Arafat, S. M. (2022). Assessment of land suitability using a soil-indicator-based approach in a geomatics environment. Scientific Reports, 12(1). https://doi.org/10.1038/s41598-022-22727-7

2) Abubakar, A., Ishak, M. Y., Uddin, M. K., Abu Bakar, A., & Mohammed, M. U. (2023). What does Modelling Tells us on the Influence of Certain Weather Parameters on Oil Palm Production in Peninsular Malaysia. Indian Journal of Agricultural Research, 57(1). https://doi.org/10.18805/IJARe.AF-715

3) Affoh, R., Zheng, H., Zhang, X., Yu, W., & Qu, C. (2023). Influences of Meteorological Factors on Maize and Sorghum Yield in Togo, West Africa. Land, 12(1). https://doi.org/10.3390/land12010123

4) Ahmed, U., Lin, J. C. W., Srivastava, G., & Djenouri, Y. (2021). A nutrient recommendation system for soil fertilization based on evolutionary computation. Computers and Electronics in Agriculture, 189. https://doi.org/10.1016/j.compag.2021.106407

5) Alhajj Ali, S., Vivaldi, G. A., Garofalo, S. Pietro, Costanza, L., & Camposeo, S. (2023). Land Suitability Analysis of Six Fruit Tree Species Immune/Resistant to Xylella fastidiosa as Alternative Crops in Infected Olive-Growing Areas. Agronomy, 13(2). https://doi.org/10.3390/agronomy13020547

8) Baldini, M., Ferfuia, C., Zuliani, F., & Danuso, F. (2020). Suitability assessment of different hemp (Cannabis sativa L.) varieties to the cultivation environment. Industrial Crops and Products, 143. https://doi.org/10.1016/j.indcrop.2019.111860

9) Chiu, M. C., Chen, C. L., Chen, C. W., & Lin, H. J. (2022). Weather fluctuation can override the effects of integrated nutrient management on fungal disease incidence in the rice fields in Taiwan. Scientific Reports, 12(1). https://doi.org/10.1038/s41598-022-08139-7

10) Confalonieri, R., Francone, C., Cappelli, G., Stella, T., Frasso, N., Carpani, M., Bregaglio, S., Acutis, M., Tubiello, F. N., & Fernandes, E. (2013). A multi-approach software library for estimating crop suitability to environment. Computers and Electronics in Agriculture, 90. https://doi.org/10.1016/j.compag.2012.09.016


THANK YOU

CLBSCSD2611_ST20284589_FINAL_PRES.pptx

ORIGINALITY REPORT

7%	7%	3%	0%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	sifisheriessciences.com Internet Source	4%
2	www.mrs.org Internet Source	2%
3	wiki.smu.edu.sg Internet Source	2%

Exclude quotes	Off	Exclude matches	Off
Exclude bibliography	On		