Ceylon Electricity Consumption Calculator Web Application

CEC SYSTEM

Cluster number : 21
Group number : 21.4
Date of Presentation : 2023 – 12 – 05

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Group members with their role

- **421420224 - R.M.I.N.Weerakoon :** Project Manager and frontend developer and backend developer (Overseeing project progress, coordinating team efforts, and ensuring project deadlines are met.)
- **721436620 - S.D.K.S.David :** Documentation part and backend developer. (Creating and maintaining project documentation user manual, and technical documentation.)
- **521428593 - K.S.Dissanayake :** Front-end Developer ,backend developer and UI/UX Designer. (Designing the user interface and ensuring a seamless user experience.
- **621431330 - U.S.N.Senavirathne :** Front-end Developer. (Implementing the user interface design using HTML, CSS, and JavaScript.)

Each member plays a crucial role in the successful development and delivery of the "Electricity Consumption Rate Calculator" web application

Introduction to the project

- “ Ceylon Electricity Consumption Calculator" web application and showcase the milestones achieved during its development.
- Creating a user-friendly web application that allows users to effortlessly track usage, calculate rates, personalized billing.
- "All stars Software Solutions (Pvt) Ltd," dedicated to completing the " Ceylon Electricity Consumption Calculator " project as part of our Bachelor of Software Engineering.
- Primary Goal is Empower users, promote efficiency, reduce electricity costs..
- Web app features: Input readings, view rates, access billing.
- We assume Users have basic computer skills and internet access.

Project objectives

Key Objectives

Meter Reading Input

- Allow users to manually input meter readings for tracking electricity consumption.

Consumption Calculation

- Calculate daily and monthly consumption rates based on user input.

Billing Accuracy

- Generate accurate billing amounts based on consumption and user-specific pricing plans.

Warning System

- Implement a system to notify users of high energy usage, encouraging conservation.

User Interface

- Develop an intuitive and user-friendly interface for seamless interaction.

Project solution

Major Components

User Registration and Authentication

- Users can securely create accounts and log in to access features.

Meter Reading Input

- User can Enter meter Reading manually.

Consumption Calculation

- The application calculates daily and monthly consumption rates.

Billing and Invoicing

- Accurate bills are generated, considering consumption and pricing plans.

Warning System

- Users receive alerts for exceeding predefined energy consumption thresholds.

User Dashboard and Reports

- A user-friendly dashboard displays consumption trends and historical data.

Technology used

Backend

- **Programming Language**
  - PHP
- **Database**
  - MySQL
- **Database Design Tools**
  - MySQL Workbench, phpMyAdmin

Frontend

- **Languages**
  - HTML5, CSS3, JavaScript
- **UI Design Tools**
  - Figma

Functional Requirement

User Registration & Authentication	• Users can create accounts and log in securely. • Authentication ensures only registered users access the app.
Meter Reading Input	• Users input daily electricity meter readings. • The system stores and validates readings.
Consumption Calculation	• App calculates daily & monthly consumption rates. • Based on entered readings & pricing plans.
Billing Information Display	• Users view total consumption & billing amounts. • Detailed breakdown of billing based on plans.
Energy Usage Notifications	• App sends notifications for high energy usage. • Alerts users of potential billing anomalies.
Data Visualization & Reports	• Visual charts & reports for consumption patterns. • Users generate personalized monthly summaries.
Data Backup & Recovery	• Regular data backups to prevent loss. • Quick recovery in case of system failures.

Non - Functional Requirement

Performance

Current User Load 500 users.

Expected Growth: 20% increase per year

Concurrent Users 100 users.

Transaction Size 50 KB (average).

Max Avg. Transaction Time 2 seconds.

Security

Secure user authentication with at least 8 characters.

Reliability

High reliability with actual time like 2 seconds.

Regular monitoring and maintenance Conduct routine monitoring.

Usability

Intuitive and user-friendly interface Conduct usability testing with target users and aim for a satisfaction score of at least 80%.

Easy navigation and data entry can complete under 3 minutes.

Documentation

Comprehensive technical documentation covering System Architecture.

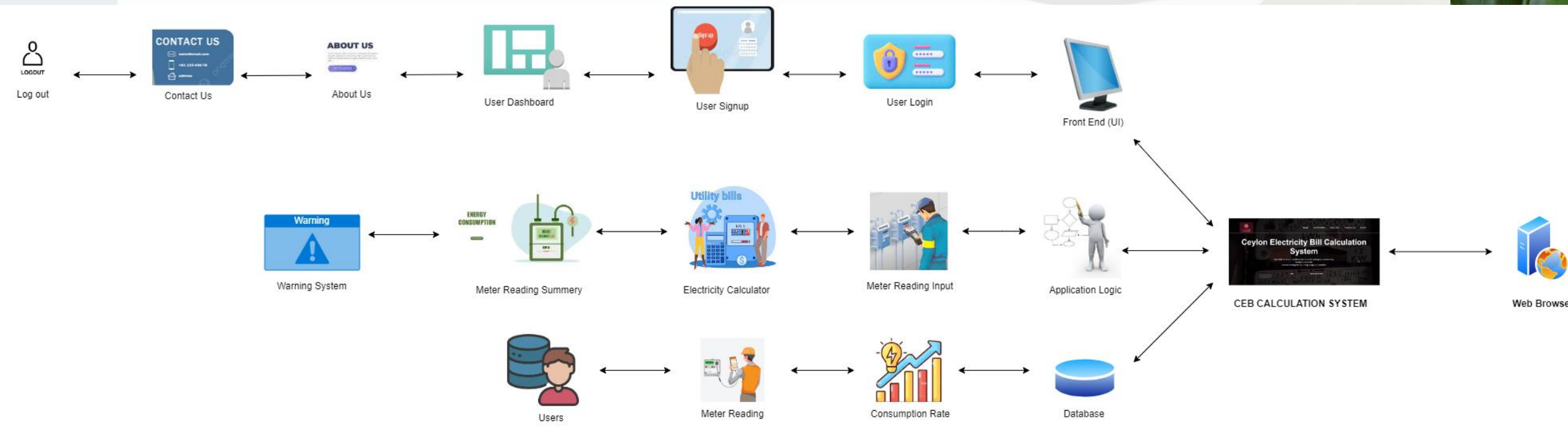
User-friendly guides and manuals written in plain language.

Design documents (Diagrams)

We have made the several design documents please refer following link -

https://drive.google.com/drive/folders/14FezUFSVO1mupnK73McQ20FPNCxNhrKO?usp=drive_link

Overall architectural diagram



Use-case diagram

Test case documents summery

1. **Login and Signup Forms**
   - Successfully validated login functionality.
   - Checked error handling for empty input fields.
2. **Contact and About Us Buttons**
   - Verified navigation functionality for additional information.
3. **Dashboard Navigation**
   - Ensured seamless navigation within the dashboard.
4. **Meter Reading Calculator Form**
   - Validated accurate calculation of consumption values.
5. **Meter Reading Input Form**
   - Confirmed functionality for selecting and inputting reading values.
6. **Meter Reading Summary Form**
   - Verified the retrieval of records for a comprehensive overview.
7. **Confirmation Page**
   - Checked display functionality and warning alerts.
8. **Logout Button**
   - Ensured successful logout and icon change.

Test case documents summery

Use the following link for refer to test case document –
Test case -
https://docs.google.com/spreadsheets/d/1Udwy6ktElq8rnaX13JPTZr1wzBFAowcN/edit?usp=sharing&ouid=104508058601594117432&rtpof=true&sd=true

Quality Assurance Test Cases (QATC)

Author:	ceylon Electricty calculator
Date Created:	11/7/2023
Last Updated:	11/19/2023
Version:	1
Environment:	Windows 8, 8.1 ,10,
Release/Build:	Sprint 2
Functional Group:	

Test Cases Summary	Count
Pass	0
Fail	0
On Hold	0
Not Executed	39
Not Applicable	0
Total Test Cases	39

Revision & Execution History

Test Case ID	Feature Description	Prerequisites	Test Description (test steps)	Input Data	Expected Result
UI					
Login form					
Lg_UI001	Verify the login display menu of the system	User has installed the system in the PC	Click on login button.	N\A	User should be able to display the login menu with user name and password fields to add.
Lg_UI002	Verify the 'Submit' functionality of the login menu	User has installed the system in the PC	Click on login button. Enter the login details. Click on submit button	N\A	User should be able to navigate to the dashboard window.
Lg_UI003	Verify the 'singupl' functionality of the login menu	User has installed the system in the PC	Click on login buttom. Click on "click here" button	N\A	User should be able to navigate to the singup window.
Lg_UI004	Verify login icon will change to username icon in the navigation bar according to username of the user who are logged into the system	User has installed the system in the PC and login in to the system	Click on login buttom. Enter the login details. Click on submit button	N\A	login icon sholud be change to username icon in the navigation bar

Test case documents summery

Use the following link for refer to test case document –
Test results -
http://docs.google.com/spreadsheets/d/1Uy4xqe6B_qPT0BxcZubJVjNJ3Z03RDBf/edit?usp=sharing&ouid=104508058601594117432&rtpof=true&sd=true

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Last Updated:	11/19/2023
Version:	1
Environment:	Windows 8, 8.1 ,10,
Release/Build:	Sprint 2
Functional Group:	

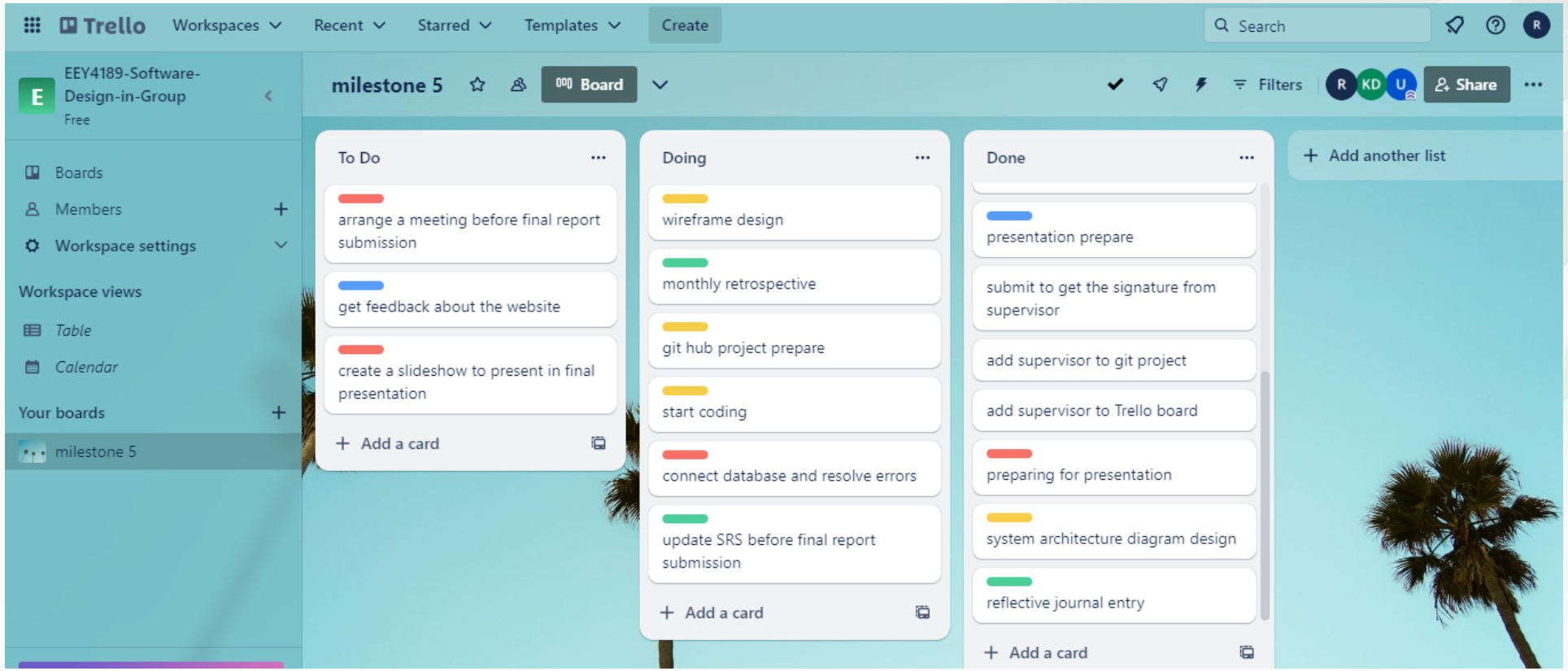
Test Cases Summary	Count
Pass	30
Fail	0
On Hold	0
Not Executed	0
Not Applicable	0
Total Test Cases	30

Revision & Execution History

Test Case ID	Feature Description	Prerequisites	Test Description (test steps)	Input Data	Expected Result
Functional					
Login form					
Lg_F001	Verify the login functionality of the system	User has installed the system in the machine.	Click on login button. Enter the login details. Click on submit button	N\A	User should be able to logged in to the system.
Lg_F002	Verify the error message at empty input functionality of the signup form	User has installed the system in the machine.	Click on signup button. Keep empty as any required filed. Click on submit button	N\A	User should be able to notify this error massage , "Fill in the all fields!"
Lg_F003	Verify the error message at empty input login functionality of the system	User has installed the system in the machine.	Click on login button. Keep empty username or password filed. Click on submit button	N\A	User should be able to notify this error massage , "Fill in the all fields!"
signup form					
SU_F001	Verify the sign up functionality of the system	User has installed the system in the machine.	Click on signup button. Enter the signup details. Click on submit button	N\A	User should be able to signed up in to the system.
SU_F002	Verify the error message at empty input sign up	User has installed the system in the	Click on login button.	N\A	User should be able to notify this error massage , "Fill in the all

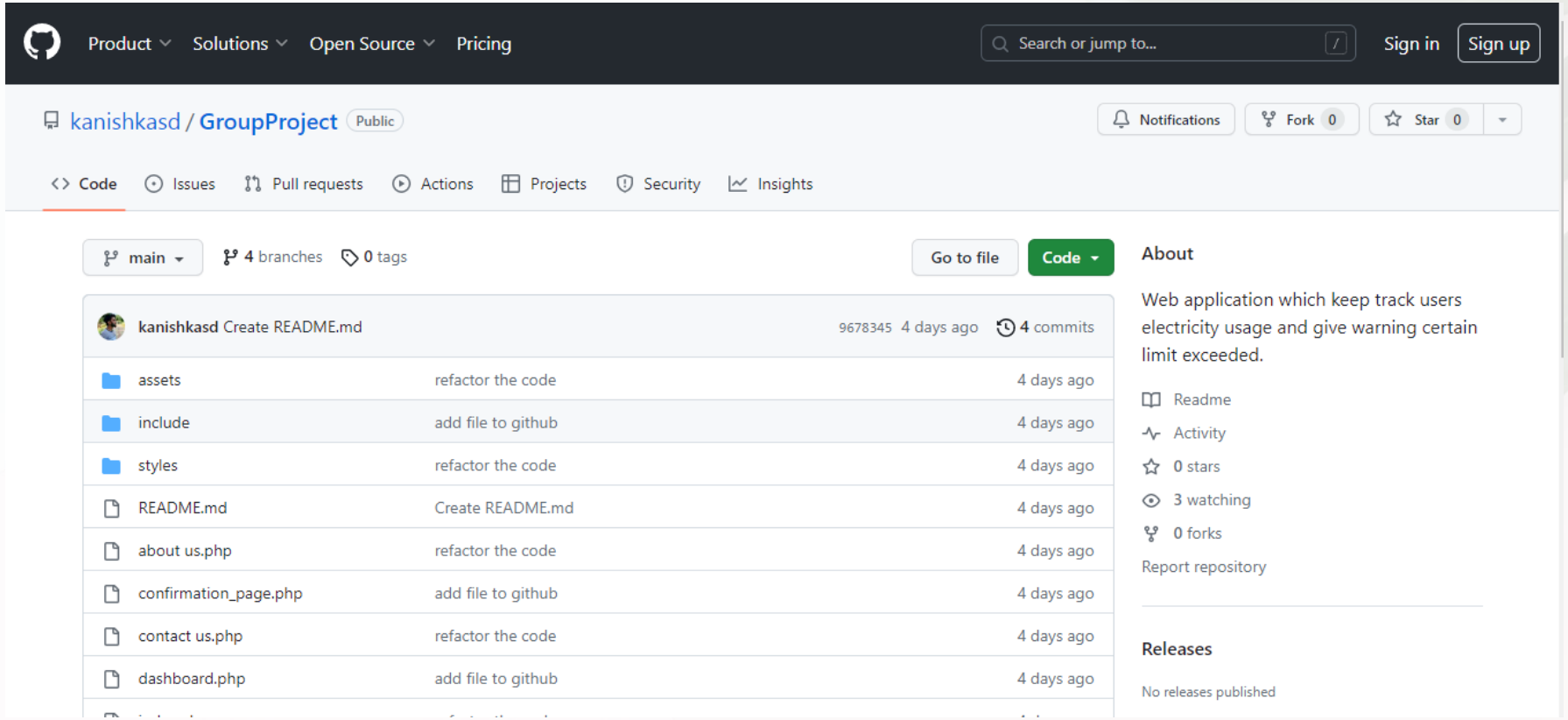
Project governance tool(Trello board)

https://trello.com/b/deiGOo7h/milestone-5



GIT Account

https://github.com/kanishkasd/GroupProject



Monthly Retrospective

- We have conduct six monthly retrospective meeting and we discuss about following
- Currently status of the application after each month.
- Discuss about the tasks which we have completed during each month.
- Review the tasks that we have completed and got the idea about succuss of the task and identify the areas need to improve.
- Identify the challenges which we have to face and discuss solutions to mitigate them.
- Developing the collaboration among team members.

Project limitation and problem encounters

Data Accuracy	Limitation: Accuracy dependent on user-provided meter readings. Problem: Inaccurate inputs may lead to incorrect calculations.
External Data Sources	Limitation: Relying on external data for pricing information. Problem: Delayed data retrieval may impact real-time calculations.
Scalability	Limitation: Challenges in handling significant user growth. Problem: Sudden spikes may cause performance issues.
Data Privacy and Security	Limitation: No guarantee against data breaches. Problem: Constant vigilance required for data protection.
User Education	Limitation: Some users may struggle with using the application. Problem: Additional efforts needed for user education.

conclusion

- **User empowerment:** Through a user-friendly interface, the system tracks usage, calculates costs, and alerts for high consumption.
- **Improvement needs:** Addressing scalability, reliance on precise input, and security risks is crucial for enhancing the system's effectiveness.

Thank you

Ahali

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Supervisor signature

(Ms .Ahali Suthaharan)

30/11/2023

Date