

## The Open University of Sri Lanka

# EEY4189 - SOFTWARE DESIGN IN GROUP (GROUP PROJECT)

CLUSTER 3
GROUP 3.5

## ROAD TRAFFIC MANAGEMENT SYSTEM

MILESTONE 6<sup>TH</sup> REPORT -Final Report

## **Group Members**

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S. Thanujan - (S18007700).

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### 1. Introduction:

In the ever-evolving landscape of urban development and transportation, the need for a sophisticated Road Traffic Management system has become increasingly apparent. Our project aims to address this demand by providing a comprehensive solution that not only acquires real-time traffic information but also offers Motor Traffic services. The primary objective of our project is to rectify the deficiencies in current transport operations and enhance the profitability of transport services. Through the utilization of cutting-edge technologies and data-driven insights, our solution seeks to minimize traffic jams and reduce fatalities on the roads. Additionally, we aspire to contribute to the overall improvement of driving training with a focus on ethical practices.

One of the key features of our system is its adaptability to diverse user groups, catering to the needs of vehicle drivers, pedestrians, visitors in Sri Lanka, and the traffic police. By focusing on the region-specific data, our solution is tailor-made to manage traffic efficiently in a given area. The holistic approach of our project goes beyond mere data collection and analysis. We emphasize the implementation of innovative technologies that resonate with the daily lives of our target users. This project stands as a testament to our commitment to fostering safer roads, more efficient transportation, and a harmonious coexistence of diverse road users.

## **Background:**

In response to the challenges posed by contemporary urban development and transportation, our project addresses the critical need for an advanced Road Traffic Management system. Focused on real-time traffic information acquisition and Motor Traffic services, our expert team empowers operators with real-time data analysis capabilities. The project's core objective is to enhance safety and traffic flow efficiently by optimizing traffic capacity. With a commitment to rectify poor transport operations, increase profitability, and reduce traffic-related issues, the project aims to implement cutting-edge technologies tailored to the specific needs of vehicle drivers, pedestrians, Sri Lanka visitors, and the traffic police, ensuring seamless integration into their daily lives.

### 2. Problem Statement:

The current state of road traffic management faces multifaceted challenges that hinder the safety, efficiency, and overall effectiveness of transportation systems. Common issues include persistent traffic congestion, a high incidence of road fatalities, inadequate training for drivers, and suboptimal utilization of traffic capacity. Additionally, there is a lack of streamlined data analysis capabilities for operators, leading to delays in decision-making and response times. These challenges collectively contribute to poor transport operations, reduced profitability of transport services, and increased frustration among road users.

## **Project Objectives:**

- Real-time Traffic Information Acquisition: Develop a system that efficiently acquires and processes real-time traffic information, providing a comprehensive view of current traffic conditions.
- Rectify Transport Operation Deficiencies: Address and rectify deficiencies in current transport operations to streamline processes and improve overall efficiency.
- Traffic Jams and Fatalities Reduction: Implement initiatives to minimize traffic jams and reduce the incidence of road fatalities through strategic traffic management and awareness programs.
- Driving Training Enhancement with Ethics: Provide comprehensive and ethical driving training programs to improve the skills and ethical practices of drivers, contributing to safer roads.
- Integration of Various Technologies: Implement a range of technologies to cater to the diverse needs of vehicle drivers, pedestrians, visitors, and traffic police, providing a userfriendly and efficient experience.
- Time-efficient Integration into Daily Life: Design the system to offer practical solutions seamlessly integrated into the day-to-day lives of road users, minimizing time spent in queues and enhancing the overall transportation experience.

## 3. Introduction to similar type of Systems

In the ever-evolving landscape of transportation and urban development, various systems have emerged to address the complex challenges associated with road traffic management. These systems are designed to enhance safety, optimize traffic flow, and provide efficient services to diverse user groups. Here, we introduce a few notable examples of similar systems that have made significant contributions to the realm of road traffic management.

## • Smart Traffic Management Systems:

These systems leverage real-time data and advanced analytics to optimize traffic signal timings, adapt to changing traffic conditions, and reduce congestion. Smart Traffic Management Systems aim to improve overall traffic flow and reduce travel times for commuters.

## • Intelligent Transportation Systems (ITS):

ITS encompasses a range of technologies and communication systems to enhance transportation safety and efficiency. This includes real-time traffic monitoring, electronic toll collection, and information dissemination to drivers for route optimization.

## • Traffic Control and Surveillance Systems:

These systems integrate surveillance cameras, sensors, and data analytics to monitor and control traffic. They play a crucial role in detecting traffic violations, managing intersections, and ensuring compliance with traffic regulations.

### • Navigation and Mapping Applications:

Popular navigation apps use real-time traffic data to provide users with optimal routes, estimated travel times, and alternative paths to avoid congested areas. These applications contribute to individual route optimization and overall traffic management.

Each of these systems plays a crucial role in addressing specific aspects of road traffic management, collectively contributing to safer, more efficient, and better-connected transportation networks.

## 4. Project Solution (Main Use case diagram)

Our comprehensive Road Traffic Management system is a groundbreaking solution that addresses the multifaceted challenges of contemporary urban development and transportation. The project's core focus is on real-time traffic information acquisition and the provision of Motor Traffic services, aiming to revolutionize the way we approach and manage traffic. To rectify the deficiencies in current transport operations, our solution employs cutting-edge technologies and leverages data-driven insights. By doing so, we strive to enhance the profitability of transport services and minimize the adverse effects of traffic congestion, ultimately reducing fatalities on the roads.

The login screen for the "Road Traffic Management System" system provides a range of options indicating its functionality and features. Users can access various programs and services related to traffic management. The absence of an option to create a new account suggests that the system is designed for existing users, possibly implying that access is restricted to authorized personnel. The list of programs includes functionalities such as checking, mapping, managing foreign and local entities, making and updating agendas, as well as handling vehicle and driver license information. The absence of a new account creation option reinforces the idea that this system is intended for individuals or entities that already have authorized access.

The adaptability of our system to diverse user groups sets it apart. It caters to the unique needs of vehicle drivers, pedestrians, visitors in Sri Lanka, and the traffic police. This region-specific approach ensures that our solution is tailor-made to efficiently manage traffic in a given area. It goes beyond traditional data collection and analysis by emphasizing the implementation of innovative technologies that seamlessly integrate into the daily lives of our target users. In conclusion, our Road Traffic Management system is not just a technological solution; it's a holistic approach to creating a safer, more efficient, and interconnected transportation ecosystem. Through a careful blend of advanced technologies and a user-centric focus, we aim to leave a lasting impact on the urban development and transportation landscape, setting new standards for road safety and traffic management.

## 5. Technology used - backend (ex. database design tools)/ Frontend (ex. UI Design tools)

## **Backend Technologies:**

Programming Language:

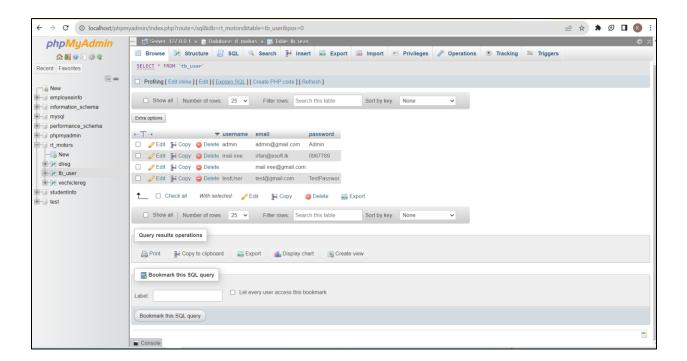
#### PHP:

PHP is chosen as the backend programming language. It is a server-side scripting language that is well-suited for web development, making it a good choice for handling the server-side logic of our Road Traffic Management system.

## **Database Design Tool:**

### phpMyAdmin:

phpMyAdmin is a web-based tool written in PHP, designed for managing MySQL databases. It provides an intuitive interface for database administration, allowing you to interact with our MySQL database, create tables, manage data, and execute SQL queries. It's a practical choice for a project where PHP is already being used as the backend language.



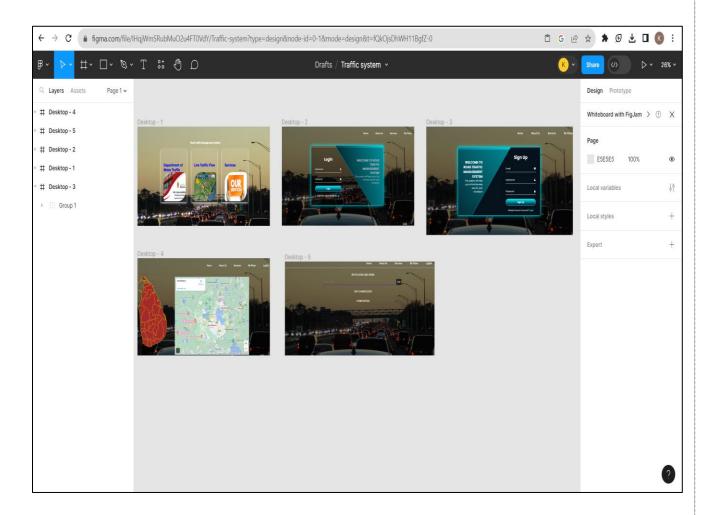
## **Frontend Technologies:**

## **UI Design Tool:**

## Figma:

Figma is selected as the UI design tool. Figma is a cloud-based design tool that facilitates collaboration among designers and other stakeholders. It allows for the creation of interactive and visually appealing user interfaces. Given the collaborative nature of your project and the need for a comprehensive solution, Figma's real-time collaboration features can be beneficial for designing a user-friendly interface that caters to diverse user groups.

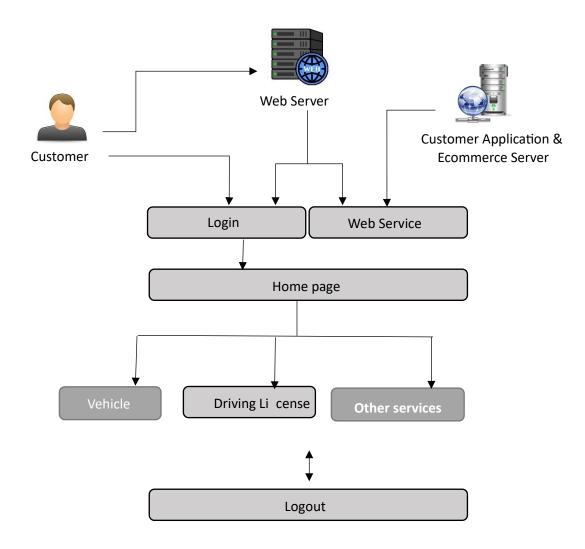
UI Figma design here for our Road Traffic Management system:



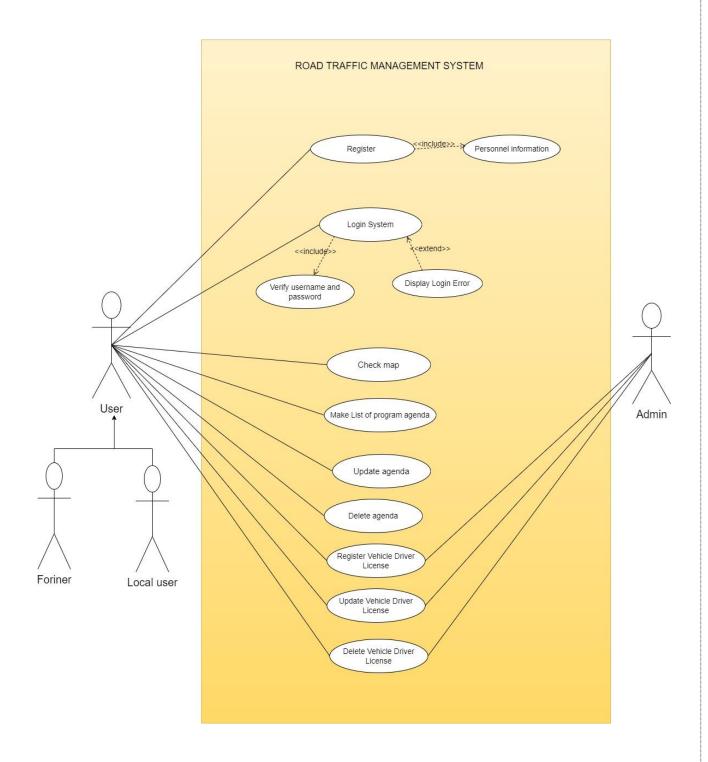
## **6.** Design document:

## Architectural diagram

As of our project the architecture is not made any changes, and it maintained as same as what we planned before. The reason why no changes mean, our project about government involvement or depend on government portal. So that we can't change the architecture of government portal without any proper reason and we don't authorize to do so.



## Use case diagram

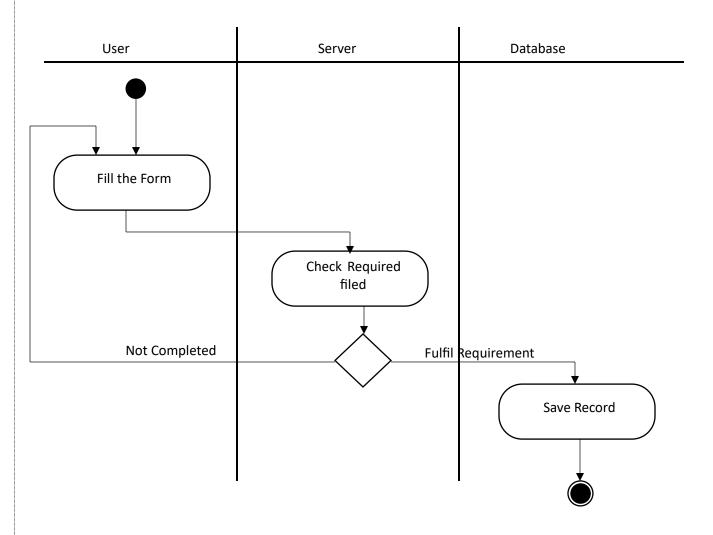


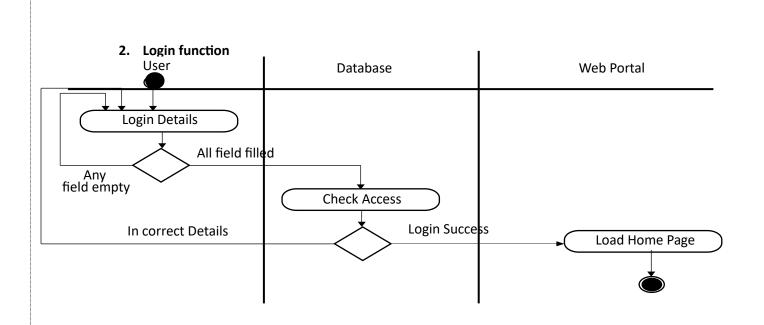
## **Activity Diagram**

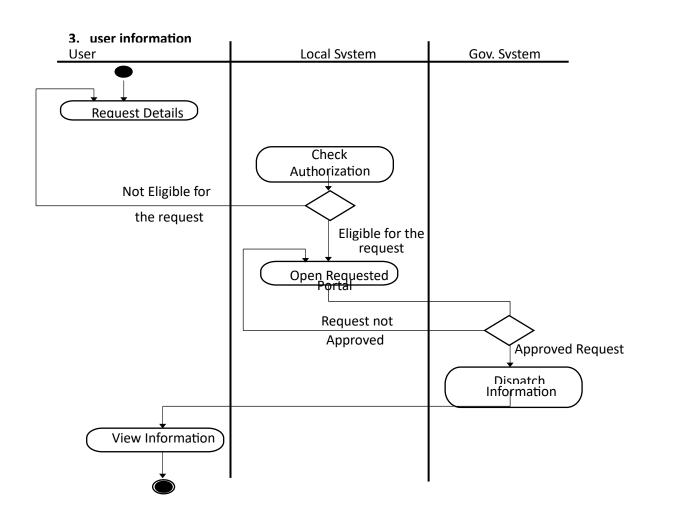
This diagram illustrate the dynamic nature of developing system by the modeling flow of control the activity to activity. Activity diagrams are used to model the work flow of the system functional operations.

The following diagrams are reflecting our system by section wises.

## 1. Activity diagram for New User Registration function

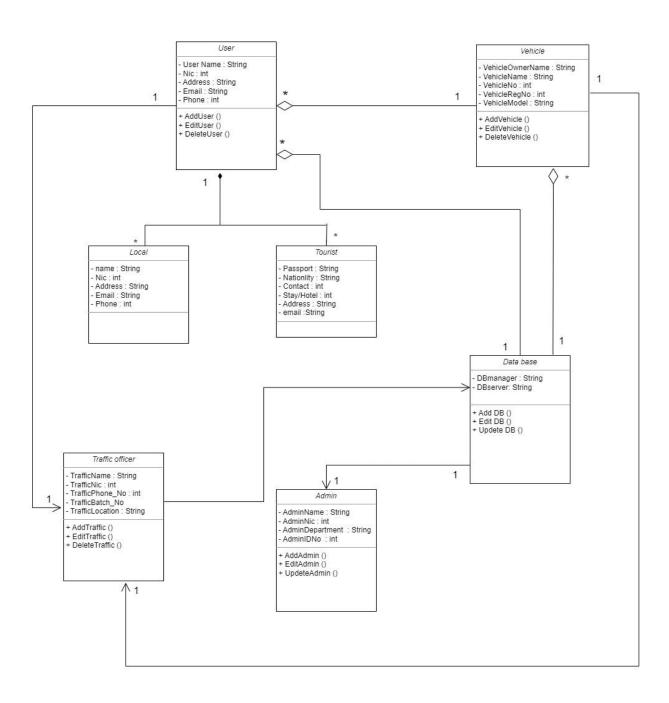




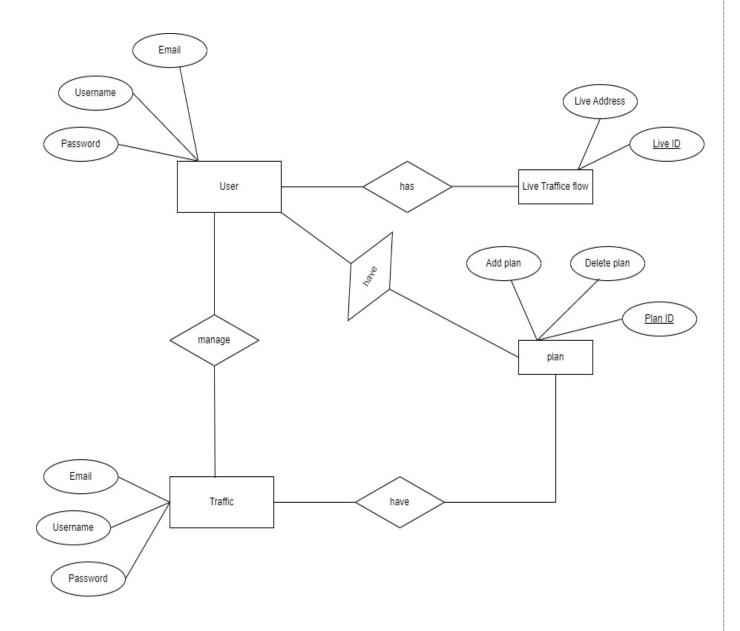


## **Class Diagram**

In short terms of class diagram, every object oriented method including UML Diagram, the class diagrams are backbone of a system.

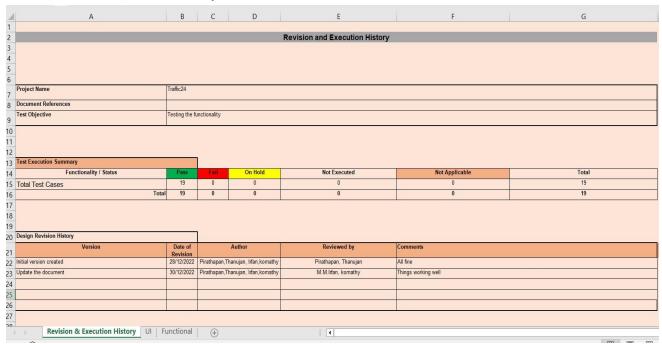


## ER (Entity Relationship) Diagram

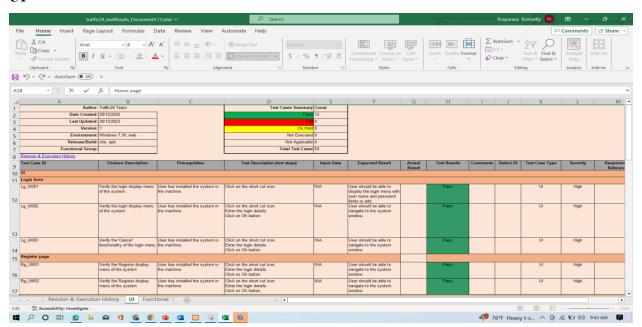


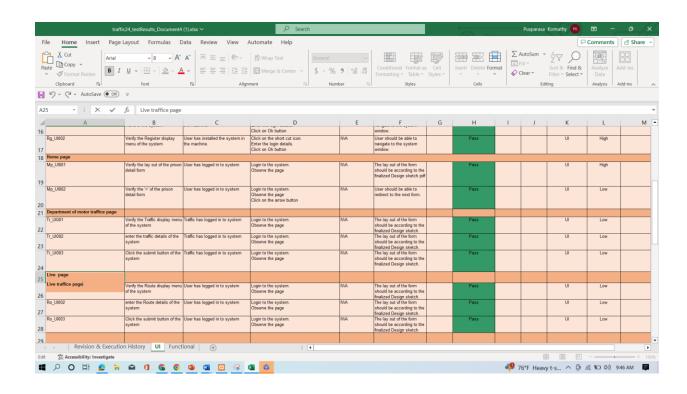
## **7.** Test Case report

## **Revision and Execution history:**

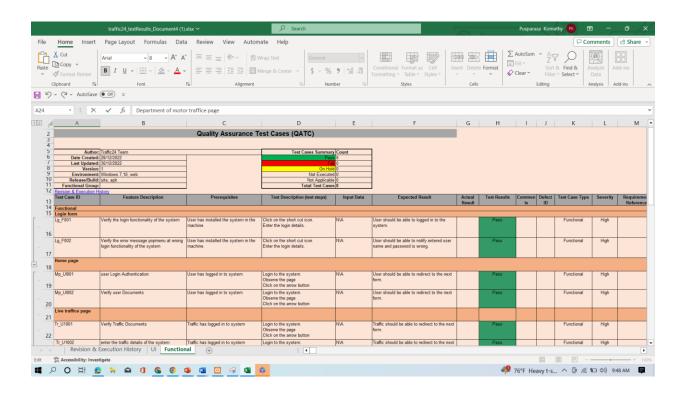


### UI





#### **Functional:**



## 8. Project limitations and Conclusion

## **Project Limitations:**

### • Data Accuracy and Availability:

The effectiveness of real-time traffic information relies on the accuracy and availability of data. Limitations in data sources or inaccuracies in the collected data may impact the system's ability to provide precise information.

## • Infrastructure Challenges:

The success of the system may be influenced by the existing infrastructure. In areas with limited technological infrastructure, the implementation and accessibility of the Road Traffic Management system could be constrained.

## • User Adoption:

The success of the project depends on user adoption. If users, including drivers, pedestrians, and traffic police, are resistant to adopting the new system or face challenges in understanding its features, the desired impact may be hindered.

## • Ethical Driving Training Uptake:

While the project aims to enhance driving training with a focus on ethical practices, the actual uptake of these training programs by drivers may vary. Encouraging widespread adoption of ethical driving practices could be a challenge.

#### • Regulatory and Legal Considerations:

Adherence to existing regulations and legal frameworks is crucial. Changes in legislation or difficulties in obtaining necessary approvals may pose limitations to the full implementation of certain features or services.

## **Conclusion:**

In conclusion, while our Road Traffic Management system represents a significant step forward in addressing the challenges of urban development and transportation, it is essential to acknowledge the project's limitations. Overcoming these limitations requires ongoing collaboration, adaptability, and a commitment to refining the system based on user feedback and changing circumstances.

Our project aims to revolutionize traffic management by providing real-time information and Motor Traffic services, rectifying deficiencies in current transport operations, and contributing to road safety. The adaptability to diverse user groups, region-specific focus, and emphasis on user-friendly technologies set our solution apart.

As we move forward, continuous monitoring, evaluation, and updates to the system will be crucial. Collaborating with relevant stakeholders, including government bodies, transportation authorities, and the community, will be essential to ensure the sustained success and impact of the Road Traffic Management system.

This project stands as a testament to our commitment to safer roads, efficient transportation, and the harmonious coexistence of diverse road users. By addressing the limitations and staying dedicated to our objectives, we believe our system can play a pivotal role in reshaping the future of urban transportation in Sri Lanka and beyond.

## **9.** Project Demonstration:

Our Road Traffic Management System's home page, featuring the Department of Motor Traffic, Live Traffic Flow, and Services sections, offers a comprehensive solution to address the diverse needs of users. Whether managing motor-related services, accessing real-time traffic information, or availing additional conveniences, the system aims to streamline processes and contribute to a safer, more efficient road transportation ecosystem.

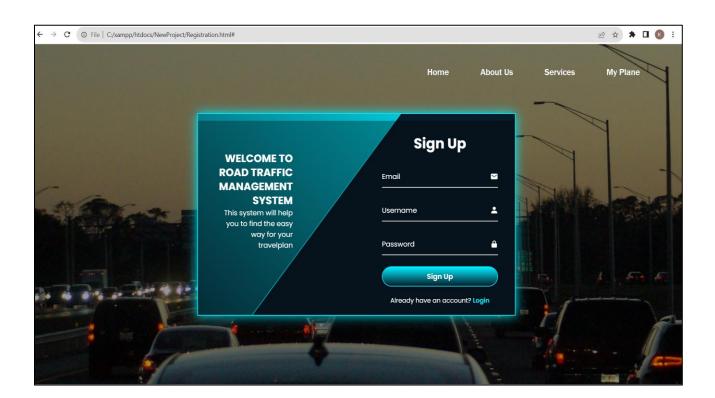


## **User Registration Process:**

- Email: The email serves as a unique identifier for each user. It allows for communication with
  the user, such as sending account-related notifications, updates, and important information.
  User Input: During the registration process, the user is prompted to provide a valid email
  address. The system may include email verification steps to ensure the accuracy of the provided
  email.
- Username: The username is a user-chosen identifier used for logging in and interacting with the system. It contributes to personalization and distinguishes one user from another.

User Input: Users are prompted to choose a username during the registration process. The system may provide guidelines for selecting a unique and appropriate username.

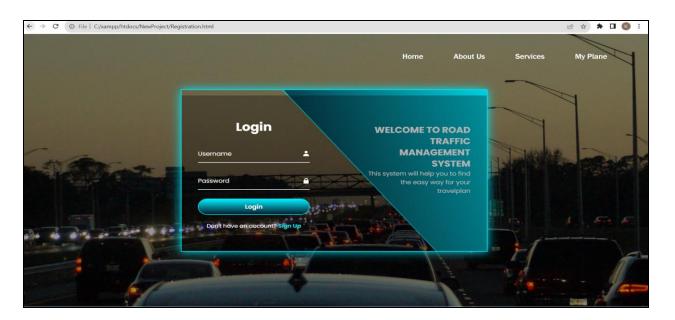
- Password: The password is a confidential authentication credential that ensures the security of
  the user's account. It should be strong and not easily guessable.
   User Input: Users are required to create a password during registration. The system may
  enforce password strength requirements, such as a minimum length, inclusion of uppercase
  and lowercase letters, numbers, and special characters.
- Security Measures: The system should employ secure hashing algorithms to store and protect user passwords. Passwords should not be stored in plaintext for security reasons.
- Account Activation: The user clicks on the confirmation link or enters the code, activating their account. Once activated, the user gains access to the system's features and functionalities.



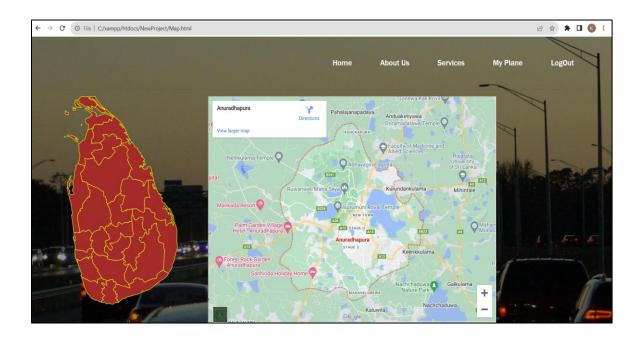
## **User Login Process:**

Enter the username and password to Login system

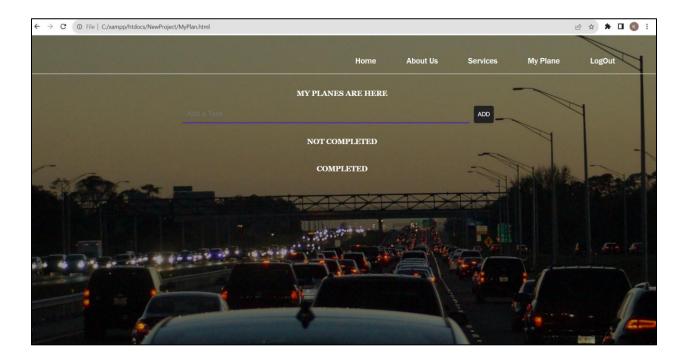
Account Activation: The user clicks on the confirmation link or enters the code, activating their account. Once activated, the user gains access to the system's features and functionalities.



**Live Traffic flow:** see the live traffic flow to click for location



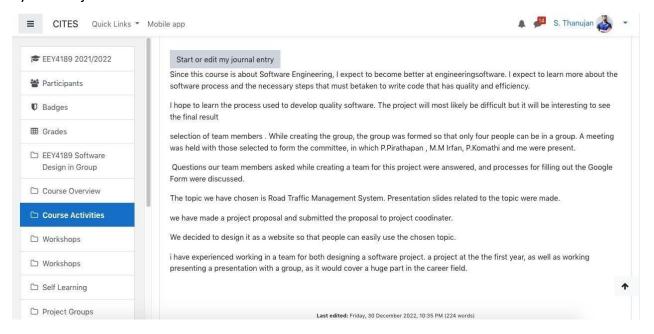
This page is use for add or delete the main plan for system user or traffic manager.



## 10. Appendix:

## Reflective journal

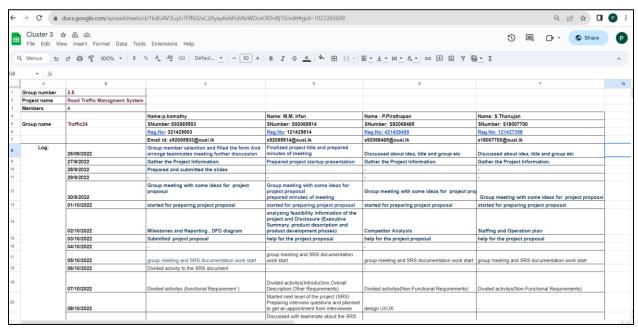
### By S.Thanujan

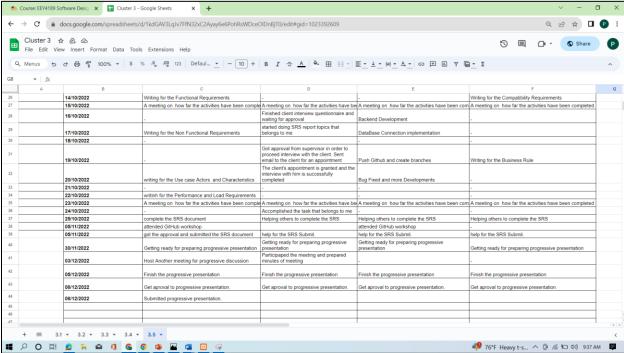


## By P. Komathy(S92065503)

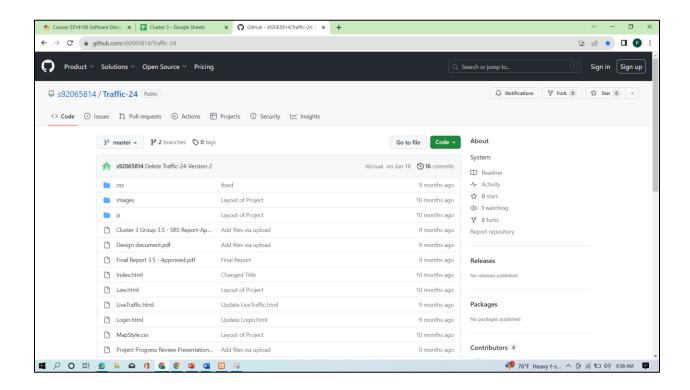


## governance tool:





## **GIT** account:



## **Meeting Minutes:**

Meeting No:1

Meeting minutes

## **Project Title Identification**

Meeting Information					
Meeting Date/Time	26th September 2022 8.30 PM				
Participants	M.M. Irfan P. Komathy P. Pirathapan S. Thanujan				
Estimated Time	1 Hour	Actual Time	45 Minutes		
Special Notes	Shake hand introduction     Project Title identification discuss				
Call/Location Information	Online Meeting via Zoom Technology				
Supported Documents	Not Applicable				

#### Agenda:

- 1. Self-Introduction
- 2. Gathering Idea about the Course
- Analysis suitable and not complicated Title for the project
   Prepare Introduction presentation

#### Notes/Clarifications:

- Gathered several titles
   Finalized with the topic "Road Traffic Management System"

#### **Meeting Minutes:**

- M/s. P. Komathy host the meeting and introduce herself first.
  So on every members introducing themselves.
  Rise up different kind of Topics for the project
  M.M. Irfan suggest the topic "Road Traffic Management System"
  All participants accept the Project Topic
- Wind up the meeting by P. Komathy

#### Action Items:

Action item	Decision made by	
M.M. Irfan	Project Topic	
P. Komathy	Documentation	
P. Prathapan	Frontend and Backend of system	
S. Thanujan	Support to P. Prathapan	

Traffic 24 26th Sep 2022

#### Meeting minutes

## **Software Requirement Specification**

	Meeting I	nformatio	on		
Meeting Date/Time	30th September 2022 9 PM				
Participants	M.M. Irfan P. Komathy P. Pirathapan S. Thanujan				
Estimated Time	1 Hour		1 Hour 30 Minutes		
Special Notes	Divide SRS Documentation Topics to each members				
Call/Location Information	Online Meeting via Zoom Technology				
Supported Documents	Web Search				

#### Agenda:

- 1. Analyze the SRS template
- 2. Divide Topics to each members

#### Notes/Clarifications:

#### **Meeting Minutes:**

- Leader P. Komathy Start the meeting.
- M.M. Irfan take part of the SRS documentation with introduction section and Interview the
- P. Prathapan accept doing UI & UX and Coding section and implement the project graphically
  P. Komathy accepted functional requirement and non-functional requirement section
- S. Thanujan support to P. Prathapan for Implementation.

#### **Action Items:**

Action item	Decision made by
P. Komathy	Functional, non-functional requirement & Use case Diagram
P. Prathapan, S. Thanujan	UI & UX, Coding, frontend and backend process
M.M. Irfan	Introduction section, Conclusion and client interview

Traffic 24 30th Sep 2022

Meeting minutes

## **Progress of SRS Documentation**

	Meeting I	nformatio	on		
Meeting Date/Time	15 <sup>th</sup> October 2022 9.30 PM				
Participants	M.M. Irfan P. Komathy P. Pirathapan S. Thanujan				
Estimated Time	30 Min Actual Time 45 Minutes				
Special Notes	<ul> <li>SRS Progress meeting</li> </ul>				
Call/Location Information	Online Meeting via Zoom Technology				
Supported Documents	Not Applicable				

#### Agenda:

1. Progress of the SRS of each members

#### Notes/Clarifications:

- 1. All members clarified how far they have been done their tasks.
- In case need assistance anyone, who finished their task and support each other to accomplish project millstone.

#### **Meeting Minutes:**

- . P. Prathapan share the meeting link via Whatsapp and Team leader P. Komathy host the meeting. Every one clarify their tasks progress
- Irfan ask help to prepare the documentation to submit
- All members support each other's to complete the millstone in time.
- Team leader checked and agree to send the SRS for Supervisor approval and upload into LMS after reveal.

#### Action Items:

Action item	Decision made by
P. Komathy	Functional, non-functional requirement & Use case Diagram
	Send to Supervisor approval
P. Prathapan, S. Thanujan	UI & UX, Coding, frontend and backend process
M.M. Irfan	Introduction section, Conclusion and done the client interview and send the signed copy to team leader

Traffic 24 15th Oct 2022

#### Meeting minutes

## **Progress of SRS Documentation - 2nd**

	Meeting I	nformatio	on		
Meeting Date/Time	3 <sup>rd</sup> November 2022 8 PM				
Participants	M.M. Irfan P. Komathy P. Pirathapan S. Thanujan				
Estimated Time	30 Min Actual Time 30 Minutes				
Special Notes	Special Notes • SRS Progress meeting - 2				
Call/Location Information	Online Meeting via Zoom Technology				
Supported Documents	Not Applicable				

#### Agenda:

1. Final Correction of the SRS Document after Supervisor comments.

#### Notes/Clarifications:

#### **Meeting Minutes:**

- Team Leader invite all members in a short meeting
- All members done their tasks correctly
  Only small corrections should rectified and the diagram need to include one more content
- Team leader windup the meeting

#### **Action Items:**

Action item	Decision made by
P. Komathy	Removed unwanted information from the SRS report, arranged proper font and alignment and re-submit for approval
M.M. Irfan	Attached annexes (Interview letter, Request mail Screenshot)
P. Pirathapan	Attached UI Screenshot

Traffic 24 3<sup>rd</sup> Nov 2022

#### Meeting minutes

## **Progressive Presentation Milestone**

	Meeting I	nformatio	on		
Meeting Date/Time	3 <sup>rd</sup> December 2022 9 PM				
Participants  M.M. Irfan P. Komathy P. Pirathapan S. Thanujan					
Estimated Time	1 Hour	Actual Time	45 Minutes		
Special Notes	<ul> <li>Presentation Slide preparation</li> </ul>	n			
Call/Location Information	Online Meeting via Zoom Technology				
Supported Documents	SRS Document     Project Proposal Document				

#### Agenda:

- 1. 10 min. presentation slides need to prepare
   Identify what information need to include

#### Notes/Clarifications:

#### **Meeting Minutes:**

- Team Leader invite all members in a meeting
- Each members agree to prepare their presentation slides based on their task Requested to practice each members perform 3 slides in 2 minutes time frame Prepared presentation need to finished within 2 days for approval

#### **Action Items:**

Action item	Decision made by
M.M. Irfan	Introduction, Progress, Attention area and Meeting minutes
P. Pirathapan	Reflective journal, GitHub and UI
P. Komathy	Functional and Non-functional requirement and use of governance tool
S. Thanujan	Document submitted and conclusion

Traffic 24 3rd Dec 2022

1	1	Re	fer	en	ces

1. <a href="https://www.smartdraw.com/uml-diagram/">https://www.smartdraw.com/uml-diagram/</a>

Ahalikai Suthaharan

approved