Software Requirements Specification

EEY4189

GROUP PROJECT

ROAD TRAFFIC MANAGEMENT SYSTEM

The Open University of Sri Lanka

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Document Revisions

Date	Version	Description	Author
Not applicable			

Document Approval

Quality Software Corporation and Police Officer of Traffic Department OIC reviewed this document and hereby agree that the contents herein are accurate. Any changes to this document must be communicated in writing and signed off by both parties.

Signature: Signed document attached in Appendix	Signature
Date: 20.10.2022	Date:
Name: Dr. S.M. Sathath	Name: Ms. Ahali Suthaharan
Customer: Chief Inspector of Police, OIC acting - Akkaraipattu Police	

Introduction

Our scope of this project as a solution for the Road Traffic Management system offers the ability to acquire real time traffic information and Motor Traffic services. In our team experts enables the operators to perform real time data analysis on the information gathered. The aim of this project improving the safety and flow of traffic utilizing traffic capacity more effectively.

1.1 Purpose

The purpose of this project is to improve poor transport operations and transport services profitability, reduce traffic jams and fatalities, provide sufficient driving training with ethic, maintain road infrastructure, and strictly maintain traffic law enforcement. Mainly improvised for looking after the set off data of region to manage the Traffic along that rea and implement various useful technologies that are been to require for various persons who are vehicle drivers, pedestrians, Sri Lanka visitors and the traffic police etc. is to give details which can be used and can be implemented in their day to day life without spent more time in a queue.

1.2 Document Conventions

In this project the highlighted part is identify the real-time road traffic status via starlight images. Therefore we link to other webpage (Google Maps) in order to get ride off from the heavy traffic situations.

1.3 Summary

As of the course EEY4189 Software Design in group we are form a group with four members. And we have been requested to do a project and before that we are planning to propose our project. In order that our project title was "Road Traffic Management".

Nowadays the topic is that need to be talked about because traffic information differs from city to city, thus when dealing with a new city, how we can merge the original traffic technology with the

new concept automatically is an important topic. We have proposed a framework for Traffic management system there are still many issues left for further development.

The main concept of traffic technology is on planning, designing, and implementing the transportation network, traffic control systems and public service in order to have smooth and efficient transportation and services.

1.4 Intended Audience and Reading Suggestions

As of this project the most significant intended for the reader is, however we all struck in the traffic and get terrible situation in our life. And we waste our valuable times in the mid road somewhere and feel the irritated moment as well. More complicated thing is waiting in the long queue in order to accomplish the task.

But we offered this project to get ride off from the all uncomfortable moments that mentions in the above. Before we get start or if you feel you would not struck from the traffic then you may refer our web based application there is a page navigate you with live traffic situation over the island by district wise. Once you check that it will guide you which area is having heavy traffic by indicating 'Red' color by road.

1.5 Scope of the project

The proposed traffic management system is a Hi quality graphical analytic module and provide premium quality Traffic incident or violation Detection and real time Traffic flow metrics and statistical analysis. Moreover this smart invention monitoring can integrate with third party management and roadway systems and host a feature rich product scope. This system can be used for identify the incident detection and road law violators or for statistical metrics of a roadway.

1.6 References

1. Bretherton, D. , Bowen, G. , Wood, K. 2002, "Effective Urban traffic management and control scoot version 4.4'. Proceedings of European Transport Conference Proceedings Cambridge.
2. https://www.sciencedirect.com/topics/computer-science/traffic-control-system
3. Google map

Overall Description

2.1 Product Perspective

This thesis aims to reduce the number of people stuck in traffic jams and we have decided to establish an integrated web based application like spot out the direct traffic situation prevailing in our country.

The topic of our thesis is Road Traffic Management System, which covers a wide range of information, so we decided to bring out the limited benefits through this network. It was also prepared with a view to bring under a single vision. All are the self-contained, existing state-owned organizations. In this program all the systems interact with each other and the following architecture is formed.

Architectural design
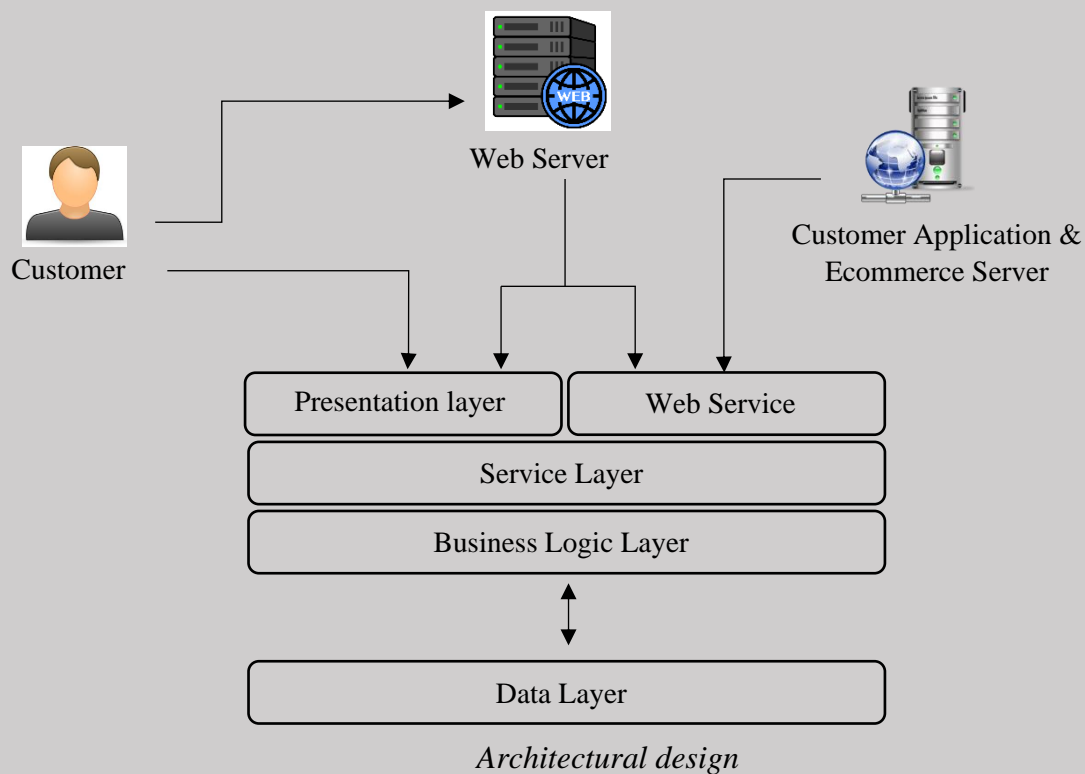
2.2 Operating Environment

In computer software, an operating environment or integrated applications environment is the environment in which users run application software. The environment consists of a user interface provided by an applications manager and usually an application programming interface to the applications manager.

Functional Requirements.

3.1 Use Case Diagram Description:

A use case diagram is a graphical depiction of a user's possible interactions with a system. A use case diagram shows various use cases and different types of users the system has and will often be accompanied by other types of diagrams as well. The use cases are represented by either circles or ellipses. The actors are often shown as stick figures.

The main purpose of a use case diagram is to show what system functions are performed for which actor. Roles of the actors in the system can be depicted. The use case analysis is the foundation upon which the system will be built.

3.2 Use case Actors and Characteristics

Users (Super Admin, System User, Traffic Police, Vehicle Owner) : User plays a main role in the project. In users we have different types of users Traffic data which can he able to use and required login form for differentusers who can register for maintaining the data.

Super Admin: Admin can manage full Applications and maintain their data securely. He can update the detailsand day to day updatingcan be done by admin.

System User : System can give the suggestions to the users during their discussion indiscussion forum. He /She will give the traffic details. For participating in discussion forum he/she has to be registered.

Traffic police : Smart Traffic Management plays a important role in maintaining data of road Trafficof a region which is helpful to users.

Vehicle Owner: Login and Logout from System and Search Traffic Routes.

3.3 use case diagram:

Hence the use case diagram mentioned below is drawn to illustrate the characteristics and professions of the actors in our project.
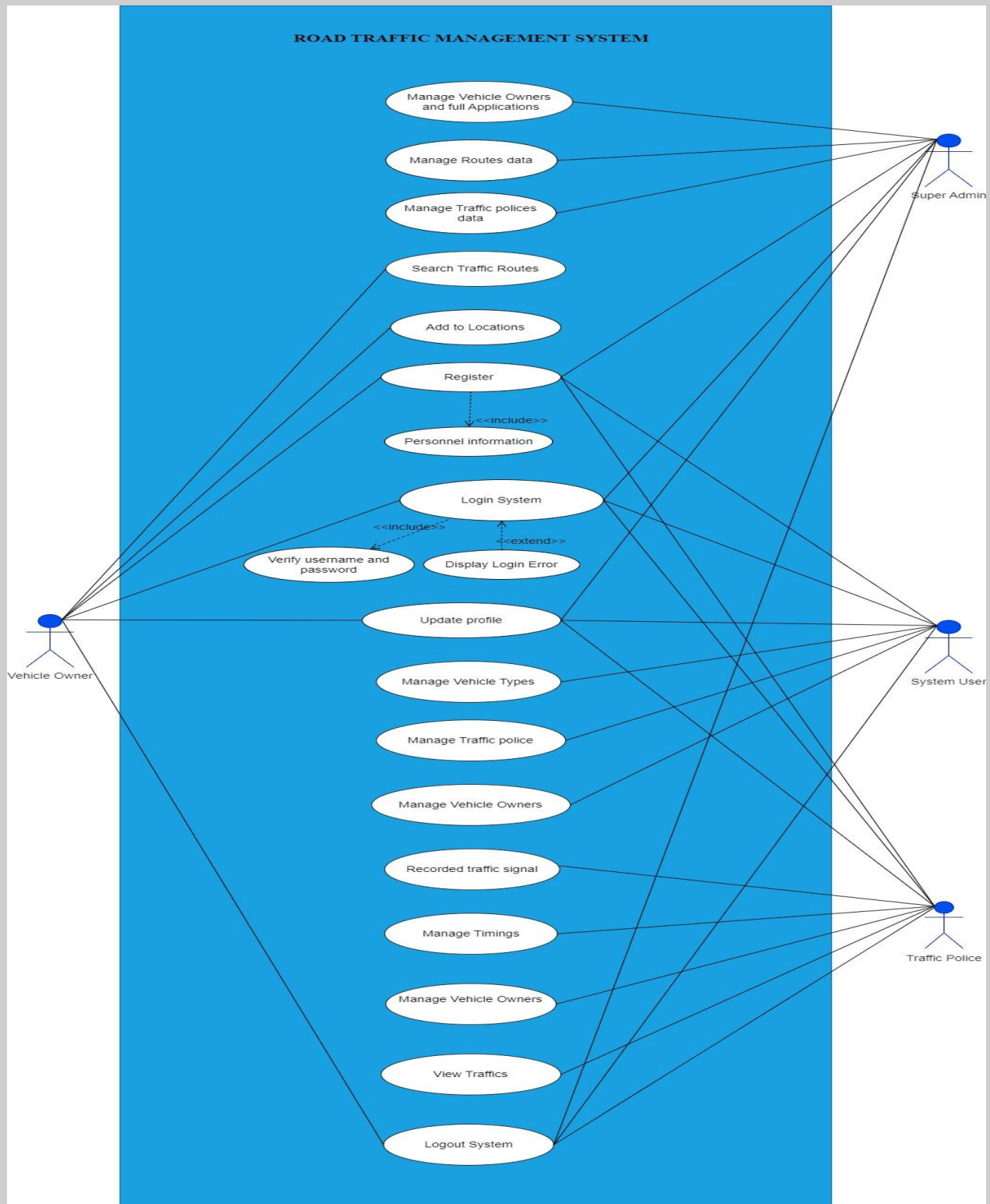
3.4 Function 1 (Functional Requirements)

Functional requirements specify that the functionality of the system. In a software development environment the system's perspective the software functionality that developers must build into the product to enable users to accomplish their tasks.

Functional Requirements are the activities that how a system should perform. The following tasks are identified in our project as functional requirement

- The system will show the traffics on a road graphically.
- The System have capability to enter the type of vehicle for specific way or should give priority to according to given type of vehicle.
- System should measure density of traffic.
- System allow which way traffic will go by.
- System should have ability to reduce traffic jam.

Register new User account.
- The register User must be familiar with the Road traffic management system.
- System must be able to verify personal information.

User Login
- Username is provided when they register.
- The system must only allow user with valid username and password to enter the system.
- The system performs authorization process which decides what user level can access.

Update profile

- Input Name in characters, email and password in alpha numeric value, mobile number profile picture, date of birth Processing Storing the values entered, in the database
  Output Confirmation message profile updated successfully.

User Logout

- The user must be able to logout after they finished system

3.5 User Profiles, Roles and Privileges.

A User Profile roles and privileges is a core app used to manage all employee information and access. Each employee is assigned a core identity user account with a single profile within the system. Identities store personal information such as user names, ID numbers, first and last names, contact information, work location, department, job title, etc. The system will also store information regarding what application accounts the user has access to, and what specific permissions are available to that user for each of those accounts.

Non-Functional Requirements

4.1.1 Performance and Load Requirements

- The performance of the functions and every module must be well.
- The overall performance of the software will enable the users to work efficiently.
- System should give better resource sharing results.
- Performance of the results and data application should be efficient and fast enough.

4.1.2. Compatibility Requirements

Compatibility testing is software testing which comes under the non functional testing category, and it is performed on an application to check its compatibility (running capability) on different platform/environments. This testing is done only when the application becomes stable.

4.1.3 External Interface Requirements

4.1.3.1 User Interfaces

The user interface must fulfil ergonomic requirements of Live traffic news. The design and layout of every form will be very clear and very interactive to the administrator. When the administrator open the software, the welcome window will appear. From each and every window the user can easily go to any desired window so that there will be an absolute and relative linking and admin can monitor and track the process easily. There should be proper coordination between the different modules and that should also be maintained at the front end in terms of look and feel to the DA. In the screen layout, the background color is very light and the graphics and font style will be in proper manner and well organized. The admin will be able to check out the logs anytime for identification of errors or lags in the system. Also the user interface must be interactive with traffic news The website must also provide some videos on home screen how to get started.
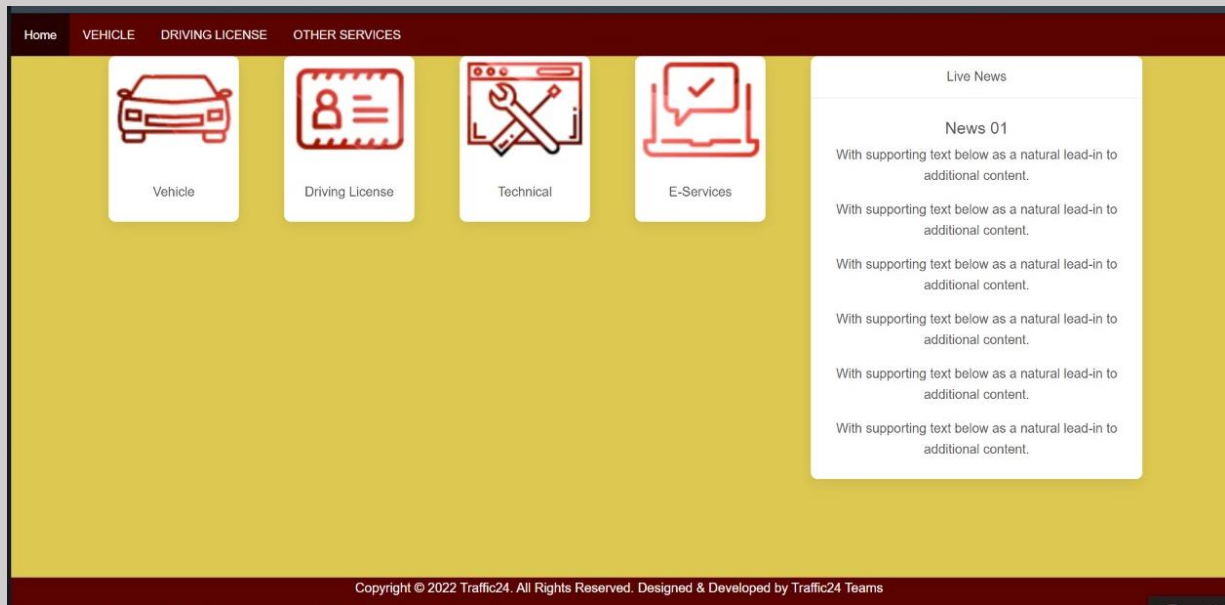
Specific Requirements

Sign up: To get access of this system user must registered and sign up their account is must.

Admin: Day to Day updating in improvements of operations can be provided by admin and they can be send to registered user every day.

View Query: The information and services are provide to the users who ask query.

4.1.3.2 Hardware Interfaces

In order to get effective and efficient performance of this system the followings are required minimal hardware requirement for this system.

Processor   :   1.2 GHz and more

Memory   :   4GB Ram

HDD Disk Space   :   150GB and more

Network   :   Ethernet or wireless connection

Keyboard   :   PS2 or USB or wireless connector

Mouse   :   PS2 or USB or wireless connector

4.1.3.3 Software Interfaces

As of this system software interface requirement will be compatible to access internet system will be advisable for this system. So that a good quality software that can be installed and guarantee its establishment and proper function when it is necessary to use an environment regularly.

Supporting OS :   The general rule that the latest version of operating system can support this system. It may windows, MacOs and Linux etc.

Web Browsing software : Internet explorer is the most common in builder web browser in Windows OS. Not only Internet explorer there are lots of browsers available in the market for free, can select which is easy to access. I recommend Microsoft Edge is most comfortable to use.

Other software :   In order to perfume well experience of internet need to install some plug in software like Adobe flash player, Pdf reader, java etc

4.1.3.4 Communication Interface:

- Client on Internet will be using HTTP/HTTPS protocols
- Firewall security is required for securing the server
- TCP/IP protocol is a basic need for client side

4.1.4 Non Functional Requirements

Non-functional requirement play a significant role in the development of the system. If nit captured properly, the system may not fulfill some of the basic business needs.

Availability

- System should be available every time and on every window it should support.

Reliability

- System should he reliable enough to satisfactorily the performance.

Supportability

- It should provide support to user to easily access all the pages without much effort and it should be capable to update and maintain in future.

Maintainability

- System should be easily maintainable. It should be flexible enough tis stand with change and exceptions. The system should also handle new requirements. It should have capability to maintain in new environment.

Usability

- System should be user friendly and should provide informative error message to inform user when something goes wrong.

Security

- Security is the main issue. System should be safe and ensure the security. It will ensure secure transfer of data.

Other Nonfunctional Requirements

The following constraints are the system must work consist of non-functional requirements:

- Confidential data security
- 24 x 7 observation and surveillance facility
- Get a better performance at the peak times
- Flexible service based architecture will be highly desirable for future extension.

5.1 Performance requirements

Nowadays many of us facing transport and traffic problems in every cities in this Island. It is very difficult to objectively assess the effects of the specific technology to make us comfortable. This report identifies the needs of users get effective services.

This analysis of the benefits does not necessarily indicate the direct comparison of the effectiveness of a city's policies with another, but signifies mainly the evaluation of the benefit of a specific investment against its cost.

5.2 Safety requirement

The problems like malfunctioning traffic signal controller due to natural disaster such as flood land sliding and the loss of power to the signal unit due to electrical outage can be lead to the traffic accidents.

A normal regular traffic controller equipment can withstand rain without malfunctioning but if submerged in water during flood then the equipment will get wet and leading to malfunction. Preventing malfunction of the equipment can be controlled as soon as the flooding subsides.

5.3 Security requirement

Sensitive data is protected from unwanted access by the user's appropriate technology and implementing strict user access criteria. Facilitated of unique username and password in such a way that unauthorized user cannot logged in. User's allows only specific terminals and specific options only.

5.4 Software Quality Attributes

This is a only allowing users to access particular terminal in order to gain service related Motor Traffic and Road Traffic services. It might be accurate and qualitative service.

5.5 Business Rules

In this system there is no any certain rules applicable other than authentication.

Other Requirements

Appendix A: Interview Questions and Answers with the interviewee's signatures

For this project research I have been handle the Interview requirement elicitation methodology. In a software engineering the term Requirement elicitation methodology is commonly used to gather information prior to develop a system. In our research it is wide range exploration but we planned to do limited part of it. Therefore we prepared the following questionnaire in order to get information for our project.

1. In our area how do you manage or control the road traffic?

Answer: Usually there is no traffics here, in case any traffic will occurred we appoint an officer to handle them

2. Within your controlled area, if the traffic certainly increased then what is your plan in order to clear the situation?

Answer: We monitor that how this traffic happened and remove the barrier or interrupting thing clean as soon as possible

3. Is there any accident occurred in the rush area's how do you handle them?

Answer: First we concern both parties if they are compromise then we leave then with their own by writing a letter both parties. If not then we take all the vehicles in our custody and file a case to produce them in a court.

4. If the Traffic officers not in the spot at right time then how do you investigate the incident?

Answer: First we start investigate from surrounding eye witness who is the victim how this happened and more.

5. What is your expectation in order to improve current system?

Answer: Most welcoming thing is all drivers should follow the Traffic law and act.

6. What are the maximum cases you been charged so far?

Answer: Most cases happened that two wheelers not following road safety and obey the police instructions

7. In your point of view, why this much case filed?

Answer: Poor road sign knowledge and don't understand the law and act.

8. What is your future consideration to be greatest achievement?

Answer: All drivers should follow and care the road rules and accident free riding is best achievement.

9. There are many drivers' drives the vehicles without any road safety awareness, what is your opinion for them?

Answer: We should teach them the road safety and rules by conducting seminars.

10. If the violators identified then what is your legal action and how do you charge them?

Answer: If the police officer instruct the driver if not care the instruction then in section 158/2 snatching the driving license and produce the charge sheet. Likewise file case and charge them upon guilty.

11. If it is ok then can I have a copy of this charge sheet for our reference?

Answer: For the security reason we cannot provide them unless you been caught by police.

12. How do you remind the suspects in order to present the court?

Answer: We send officers to their home and produce the warrant

13. If we propose this system, what is your point of view?

Answer: Much appreciate your mind mapping

14. How satisfy you are? With the current system of our proposed system?

Answer: This is good one by the way not only me decide the others as well

15. We have planned to spot out the direct traffic situation prevailing in our country by district wise in our system. Also we are trying to design this to help not only the local people but also foreign tourists. What is your opinion regarding this?

Answer: This idea was appreciated and it will be easy to us for the investigation and find the culprits who are violate rules.

Interviewee Details:

Name :   Dr. S.M. Sathath Chief Inspector of Police, OIC Acting
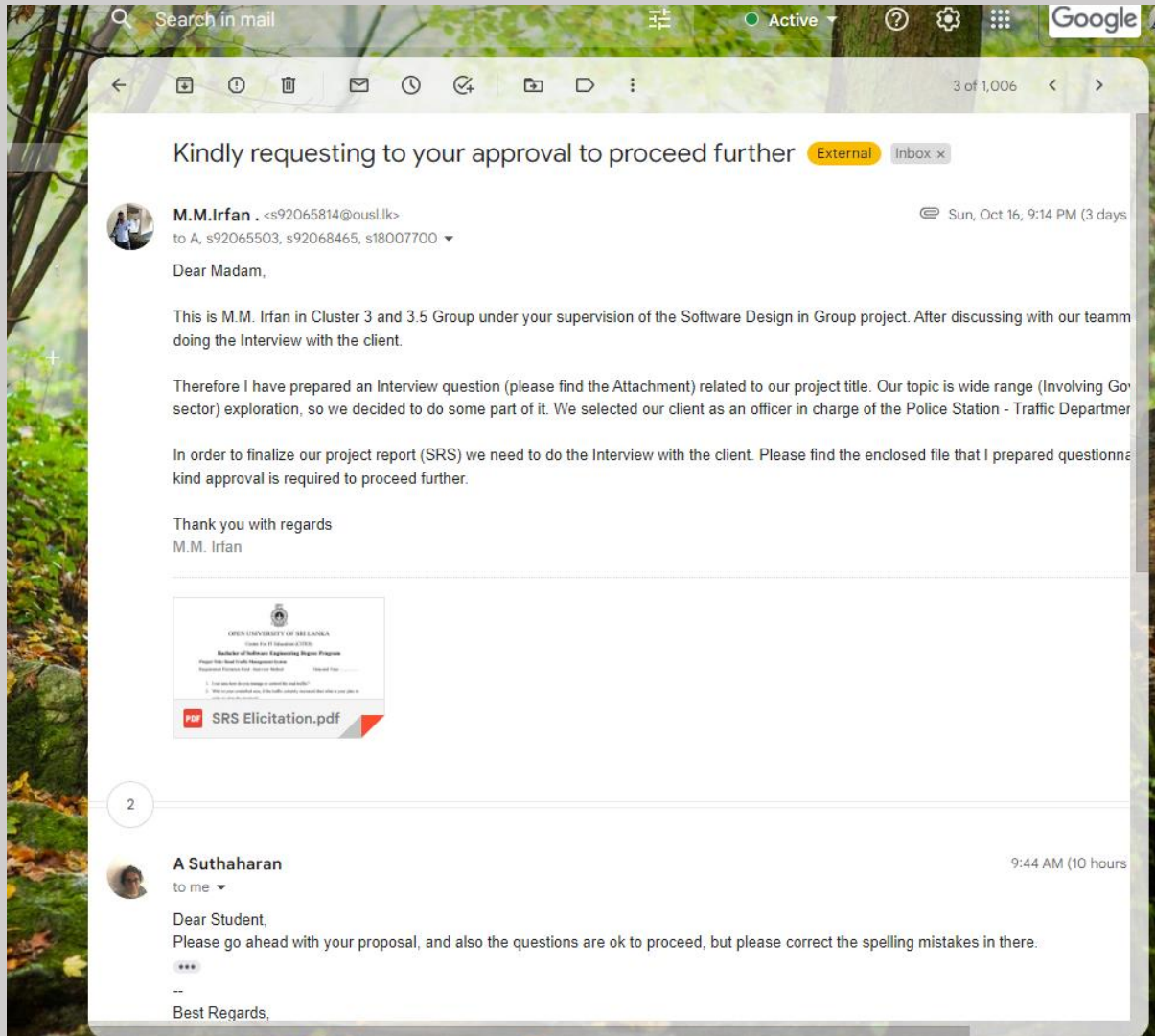
Address :   Akkaraipattu Police Station, Akkaraipattu
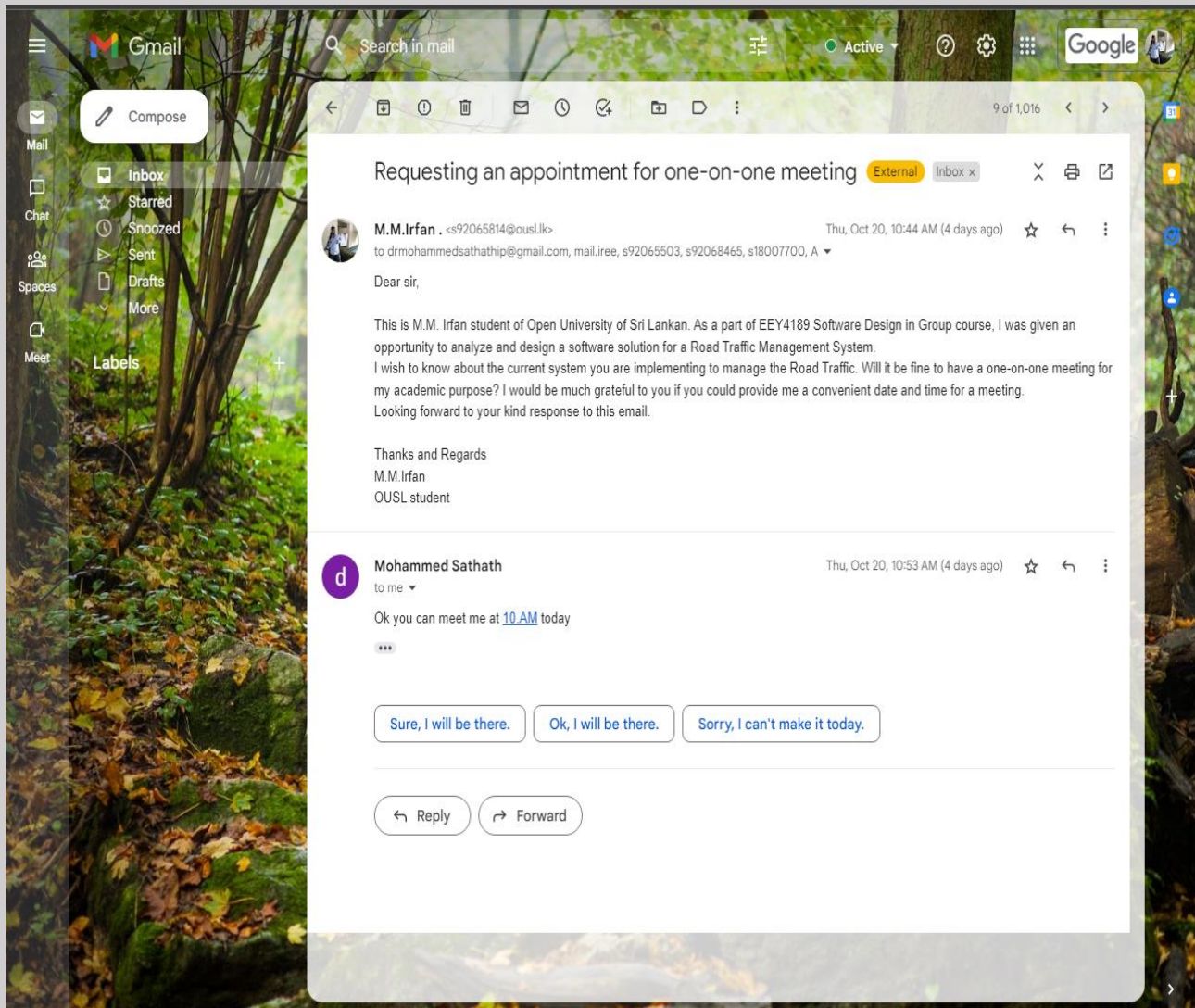
Email: drmohammedsathathip@gmail.com

Contact :   0741477771

Date :   20.10.2022 at 10 AM

Approval mail from Supervisor for Interview

One-on-One meeting Request letter

Interviewee Signature copy.

Note: The interview made with the client in Tamil medium and the answers are converted into English and mentions in the Questionnaire.

OPEN UNIVERSITY OF SRI LANKA

Center For IT Education (CITES)

Bachelor of Software Engineering Degree Program

Project Title: Road Traffic Management System

Requirement Elicitation Used : Interview Method

Date and Time: 20.10.2022. 10 AM.

1. In our area how do you manage or control the road traffic?
2. Within your controlled area, if the traffic certainly increased then what is your plan in order to clear the situation?
3. Is there any accident occurred in the rush area's how do you handle them?
4. If the Traffic officers not in the spot at right time then how do you investigate the incident?
5. What is your expectation in order to improve current system?
6. What are the maximum cases you been charged so far?
7. In your point of view, why this much case filed?
8. What is your future consideration to be greatest achievement?
9. There are many drivers' drives the vehicles without any road safety awareness, what is your opinion for them?
10. If the violators identified then what is your legal action and how do you charge them?
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15. We have planned to spot out the direct traffic situation prevailing in our country by district wise in our system. Also we are trying to design this to help not only the local people but also foreign tourists. What is your opinion regarding this?

Interviewer Details

Name: M.M. Irfan

Student of OUSL

Interviewee Details

Name: Dr. S.M. Sathath. Cheif inspector of police OIC acting

Address: OIC acting - Akkaraipattu. Akkaraipattu

Contacts: 0741477771

Signature with Office Stamp

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Conclusion

Traffic jam is a very serious issue in every city that causes several problems for common man. It consumes so much of time and energy unnecessarily and hence the loss of the nation. Therefore, serious measures have to be taken by the authorities to control traffic and promote the use of public transport. Development of public transport network at economical rates is essential. Implementation of traffic safety rules by traffic police is a must. People should drive more sensibly and responsibly. Hence we all can work in this way to solve the big threat of the current time.

Thank you.