Sri Lanka Institute of Information Technology

PROJECT REGISTRATION FORM

(This form should be completed and submitted on or before 11.55 PM, Friday 17th January, 2020)

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), 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.

PROJECT TITLE (As per the accepted topic assessment form)	SmartCop - Automated Platform to Mitigate the Impact of Road Accidents

RESEARCH GROUP **(as per the Topic assessment Form)**	ICT for Development

PROJECT NUMBER	Tmp/2020/27	(will be assigned by the lecture in charge)

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

	STUDENT NAME	STUDENT NO.	CONTACT NO.	EMAIL ADDRESS
1	Sewwandi A.K.T. (GROUP LEADER)	IT16165830	0778540164	tharukiamayasewwandi95@gmail.com
2	Dissanayake D.M.K.P.	IT16138896	0776006758	kavipabasara@gmail.com
3	Navanjani D.H.K.H.	IT16170094	0714732226	hnavanjani11@gmail.com
4	Shangavie R.	IT16167124	0774602435	sshangavie@gmail.com

SUPERVISOR Details

Dr. Windhya Rankothge		
Name	Signature	Date

CO-SUPERVISOR Details (will be assigned by the Supervisor, if necessary)

Ms. Narmada Gamage		
Name	Signature	Date

EXTERNAL SUPERVISOR Details (if any, may be from the industry)

Name	Affiliation	Contact Address	Contact Numbers	Signature/Date

ACCEPTANCE BY CDAP MEMBER

Name	Signature	Date

PROJECT DETAILS

Brief Description of your Research Problem: (extract from the topic assessment form)

Nowadays, there is a considerable increase in number of road accidents in Sri Lanka due to various reasons. As a result of these incidents, injuries and cause of deaths as well as damages for assets and public infrastructure are increasing. As a responsible government authority in protecting people and assets of civilians, the Department of Police in Sri Lanka has a major duty to eliminate road accidents into acceptable levels. Even though, there are several statistical analysis which are conducted manually by relevant police stations, still that has not been significantly contributed to decrease the trend of road accidents. In addition, police stations encounter various inconveniences in scheduling and disseminating police officers to control road accidents effectively and efficiently. Furthermore, the lack of awareness of the public regarding road accidents especially how to prevent from road accidents and how to react and response after road accidents is major cause of increasing road accidents.

[1] Wilson, J.M. and Weiss, A., "Police Staffing Allocation and Managing Workload Demand: A Critical Assessment of Existing Practices" Policing, Vol. 8, no. 2. Pgs. 96-108, February, 2014.

[2] M.F.Dando, P.Joshi, P.k.De Guzman, E.Tampos, F.Balahadia, "Development of Game based learning Application for First Aid Awareness ".

[3] M.Chong, A.Abraham and M.Paprzycki, "Traffic Accident Analysis Using Machine Learning Paradigms".

[4] S.T.C.I.Wimaladharma, A.G.A.ampath, J.D.B.Sampath, C.H.V.Sapumohotti, "A Game Based Driving Learning System for Sri Lankan Driving Learners to Enrich the Awareness of Road Rules".

[5] Nikhat Ikram, Shilpa Mahajan: "Road accidents: Overview of its causes, avoidance scheme and a new proposed technique for avoidance", 2016 3rd International Conference on Computing for Sustainable Global Development (INDIACom), IEEE Conferences, 2016.

Description of the Solution: (extract from the topic assessment form)

Main solution is to provide an automated platform called "SmartCop" to predict road accidents, schedule police officers according to predictions, road accident prevention awareness game and road accident response awareness game. The system will be developed as a requirement of the Sri Lanka Police. According to that we have planned to use the Nugegoda Police administrative division in Sri Lanka as the data source and testing environment with the intention to maximize the system to facilitate the whole country in future.

Road accidents prediction will be done using identified set of variables gathered from relevant police stations according to specified algorithms. The output will be displayed accurately to the responsible parties of the police stations. The data and analytics will be categorized according to predefined measurements.

In addition, police officers enforcement will be done by using predicted data of road accidents in order to eliminate road accidents up to some extent. Furthermore several parameters will be used to analyse performance and availability of each police officers in order to recommend the most suitable and available police officer for the duty.

Moreover the system aims to develop a Game Based Learning mobile application in order to disseminate information and improve public awareness about prevention and response for road accidents. The application will educate and instruct the user on how to perform the game through a tutorial session so that users from any age range can be easily familiar with the game. Apart from that the Sri Lanka Police also will be able to gain the insight about the overall public awareness on road accidents.

Main expected outcomes of the project: (extract from the topic assessment form)

Main Objective :

- Minimizing the impact of road accidents using Machine Learning based prediction and Game Based Learning.

Sub Objectives :

- Develop a model for predicting road accidents
- Schedule traffic police officers according to predicted road accidents forecasts.
- Introduce a game based learning approach to enhance road accident prevention awareness among drivers and pedestrians.
- Develop a game based learning application to improve the awareness on accident response among people.

WORKLOAD ALLOCATION (extract from the topic assessment form)
(Please provide a brief description about the workload allocation)

MEMBER 1

Schedule traffic police officers according to predicted road accidents forecasts

- Develop a dashboard to allocate and schedule traffic police officers according to predicted forecasts.
- Analyse experience, training taken and qualifications of police officers in order to identify police officers with best performance.
- Develop a model to predict the availability of traffic police officers and allocate them to appropriate tasks by analysing leave taken and shift information.
- Schedule and disseminate recognized traffic police officers to predicted road accident hotspots.

- Send notifications and reminders to allocated police officers.

MEMBER 2

Develop a model for predicting road accidents

- Develop a model for predicting road accidents with the help of data provided by relevant police stations
- Develop main dashboard including proper analytics and prediction results with a notification system
- Gather relevant data according to selected variables, train them and update the automated system

- Database management

MEMBER 3

Introduce a Game Based Learning approach to enhance road accident prevention awareness among drivers and pedestrians.

- Identify essential competencies required for enhancing the awareness about primary and secondary prevention of road accidents and develop an appropriate game. (primary prevention : the prevention of incidents which might lead to injury such as road hazard and irresponsible driving, secondary prevention : the prevention of injury in incidents which do happen such as the use of seat belts, air bags and helmets.)
- Evaluating provided answers for the game, assign scores and determine user's awareness level.
- Develop user profiles containing individual awareness level, previous attempt details, used time duration etc.
- Allow police officers to view overall public awareness reports through the web portal.

MEMBER 4

Develop a game based learning application to improve the awareness on road accident response among people.

- Recognize crucial skills necessary for road accident treatment awareness and create a suitable game with appropriate questions, answers and pictures.
- Display individual awareness level as a result to the individual on how many times he/she takes a game, how long have they spent on each question to answer in each try and their score in each try through mobile device.

- Display overall awareness level on accident response of people to police officers through web portal.

- Realtime data management.

DECLARATION

"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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