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Development and Management of State-wise Vehicle tracking platform for Safety & Enforcement

Mr. Ayush Gaur, Shraddha Sharma

1. Introduction

With the increase in the number of crimes against women and children now a days. It has become utterly important to have safety measure at every step. With public transport being the biggest medium of travelling in India, a suitable prevention measure must be taken in order to protect women and children traveling in the vehicle. It was after the unfortunate Nirbhaya incident, that Government of India, did come up with plans and measures to take step towards a new and more protected traveling in public transport. Ministry of Road Transport and Highways, Government oof India had issued a notification dated on 28th November 2016, which stated that Vehicle Location Tracking (VLT) Device and Emergency Button were mandated to be fitted in all public service vehicles w.e.f 1st April, 2018. ln order to standardize the specification of VLT and Emergency button across thecountry, AIS 140 standards were released by ARAI for Ministry of Road Transport &Highway (MoRTH). The standard mainly includes the specifications for VehicleLocation Tracking device (VLTD) and vehicle tracking Backend system. The vehiclelocation tracking device and the emergency button must be fitted by themanufacturers or their respective dealers or operators as the case may be inaccordance with the AIS 140, as amended from time to time, title corresponding BISStandards are notified under the Bureau of Indian Standards Act, 1986.

The States were required to set up Command and Control Centre's (MonitoringCentres) as per MoRTH notification and AIS-140 to provide interface to variousstakeholders etc. as per code of practice of AIS 140. Since the States could not set up the Monitoring Centres, the effective implementation of the vehicle tracking system could not be done. Though a few states for implementation of VLT Devices and Emergency Buttons are using BSNL AIS 140 Compliant Common Layer backend. It was therefore felt necessary to support the States under Nirbhaya Framework to set up Monitoring Centres at the earliestso as to effectively implement the vehicle tracking system and ensure safe commute to the women and children in public passenger transport vehicles.

The Monitoring Centresin the States shall be used to provide interface to variousstakeholders such as State emergency response centre, the transport departmentor Regional Transport Offices, MoRTH and its designated agency, law enforcementagency, VLT device manufacturers and their franchisees, etc. The MonitoringCentres shall receive data from the VLT devices in the vehicles and process thesame. The Monitoring Centre shallalso process the alerts specified in AIS 140specification. The Ministry therefore has decided to support the States/UTs to implement the project by providing funds under the Nirbhaya Framework and wouldlike to takeonboard at the States/UTs to implement the same effectively.

2. OBJECTIVES

2.1. Safety of women and girl children is a prime concern during their travel in publicpassenger transport vehicles [like cabs, taxis, public buses etc. The proposed systemenvisages to enhance the safety of the women and the girl children by equipping allthe public passenger transport vehicles with location tracking device andemergency buttons for raising an alert in case of emergency.

2.2. Monitoring Centre shall be setup in each State/UT for monitoring the alerts andcoordinating with State ERSS for responding to distress calls.

3. Research Methodology

An individual study is being done on this topic as very less research paper has been written on this topic in detail. This study is being solely done on the basis of secondary data and the guidelines provided by the mentor. A very vital role in the statistical analysis is gathering data from various sources. Primary and Secondary Data in research are the two methods to gather information from various sources, under which come various other sub-methods. (Douglas, 2015) (ajayi, 2017). Primary data is the data that is gathered by researchers from first-hand sources with the use of various methods like interviews, surveys, or experiments. It is collected by directly from the primary a source keeping the project in mind. (Brizee, 2017). On the other hand, secondary data is based on the preexisting sources and re-analyzing or re-interpreting them.

3.1 Qualitative and Quantitative Techniques as Research Methodology

To attain the objective of this research, the qualitative method was opted. One major pro of the qualitative method is that it is the most apt method for small samples. Qualitative data it develops a defined and a generous data depending on the behaviour of a certain group of people or any taken sample. Its general characteristic, which also includes its basic difference with quantitative research, is that it gives a comprehensive explanation and analysis of a research subject, without limiting the scope of the research and nature of the participant's responses. (Collis and Hussey 2003)

However, the strength of qualitative research is vitally based on the abilities and skills of researcher, the aftermath may not be perceived as reliable, because they mostly come from researcher's own point of view interpretation and judgements. Since it is more appropriate for small samples, also it is risky for the results of qualitative research to be considered as reflecting the opinions of a wider population (Bell, 2005)

3.2 Research Approach

The approach that was opted for this research was proven to be an influencing one. Researchers begun with this specific observation, which helps in producing theories and solution, can also be drawn from them. The reason for taking up the inductive approach was that it takes into account the context where research effort is being made active, while it is also most appropriate for small samples that produce qualitative data. The reliability of the research outcomes gets under question because of its one of the major weakness of the inductive approach which is creating generalized theories and solutions based only on a sample of small

number of observations. (Denzin& Lincoln, 2005).

3.3 Data Collection and Methods

In this research paper secondary data is used. The data was picked form the several trusted sources available wiz, guidelines provided, Internet, blogs, newspaper, research papers, journals, articles etc. The data from a secondary source set is typically already cleansed and stored in an electronic format, so the researcher can spend time on analysing the data instead of investing the time in having to prepare the data for analysis

Another advantage of analysing and interpreting the secondary data instead of collecting and analysing primary data, it is sheer volume and breadth of the data that is already available. The information was retrieved from DIMTS website itself, as mentioned above news articles, etc. Primary data could not be used for this as the process is confidential and not everything could be kept out in the public.

4. System Overview

The proposed Vehicle Tracking System consists of a Vehicle Location Tracking (VLT) device, which possess Emergency buttons, meeting the specifications of AIS-140, mounted in the vehicle, which will send the vehicle location, health status, alerts and other data to the Monitoring centre at a specified periodicity. A Standard Operating procedure (SoP) shall be defined by State/UT for handling emergency alerts at the Monitoring Centre. The Transport Department officials will be able to access the system and monitor the alerts at the Monitoring Centre. The actionable alerts will be filtered and handled as per the Standard Operating Procedure (SoP) formulated by State/ UT.

The system will be a web-based system so that the officials concerned will be able to use the system on their desktop computers. For states equipped with fullyfunctional ERSS, the VLT device shall be configured to send data to Monitoring Centre and to the ERSS of the State. However, for states equipped with only partially functional ERSS, the VLT device will be configured to send emergency button press alert and related data to Monitoring Centre. The alert will be handled by the monitoring official and forwarded to the concerned aid agency or police manually.

The steps taken by the Government of India will not only help the people traveling in public transport but will also be helpful for those who owns them. A team of professionals are constantly working on this project to be a success and to help in decrease the number of crimes against women and children.

5. Data Analysis

Talking about the implementation of the tracking devices it is in the hand of State Government partially. Going by the multiple articles, research papers on the safety for women and children, most of them points at the capital of India for being the most unsafe place for women to travel alone be it a day or night.

With number of females working as professionals in day shift or night shifts, a responsibility of their safety is constantly a topic to think about and worry. With the implementation of State Wise, vehicle tracking system A majority of 65 per cent of women in Delhi interviewed said they felt insecure working

in night shifts, while the figure was the least for Mumbai at 26 per cent, according to a survey by industry chamber Assocham. Also when Delhi being a famous tourist place for foreigners it becomes necessary to take such steps and make it mandatory all over the country to input these tracking devices.

For the mechanism and implementation, the states have to set up monitoring centre(Command and Control Centre or backend system) in compliance to AIS- 140.

The states will deploy agencies to build the monitoring centre. The Centre has decided to lend their support to State/UTs in setting up the Monitoring Centrethrough Nirbhaya framework by providing financial assistance as per the Scheme.

Till the time the states set up the Monitoring Centres under this Scheme, they shallensure the compliance of CMVR125H for vehicles registered after 1st Jan 2019through VAHAN/ respective state vehicle registration system using any backendsystem as per MoRTH SO No. 5453 date 25 October 2018. The states shall notify the timelines for implementation of VLT device installation with respect to the vehicles registered prior to 1't Jan 2019. The passenger transport vehicle owners shall have the responsibility to purchase the vehicle tracking device and emergency button(s) and get them installed from any of the type approved VLT device vendors. For ensuring proper fitment of VLTD in vehicles, the VLT manufacturer shall enterthe Unique identification number in VAHAN database for the purposes of tinkling theVLT device to the specific public service vehicle, in case of retro fitment in oldvehicles. ln case of new vehicles where the VLT device is installed by the vehiclemanufacturer, then the above process shall be undertaken by the vehiclemanufacturer/ or their authorized agency. The Monitoring Centre set up by States/UTs shalt provide access to variousstakeholders / systems such as their transport department/RTO officials, devicesuppliers, testing agencies, permit holders, VAHAN &MoRTH. The States/UTs willensure that the Monitoring Centre are mandatoryto linked to States/ UTsERSS/otheremergency response systems.A Dashboard will be set up at MoRTH for the monitoring of Scheme. The State/UT'sMonitoring Centres will share data with MORTH Dashboard as defined in AIS 140 orspecified by MoRTH from time to time, for the purpose of monitoring of the Scheme.

5.1Sources of finance for the Scheme and Total Cost of the Project

The Government of India has set up Nirbhaya Fund which is being administered byDepartment of Economic Affairs, Ministry of Finance. The fund is mandated to beutilized for projects related to women safety and security. The instant project shallbe financedfrom Nirbhaya Fund Total cost shall [be shared between Centre Government andStates/UTs in the ratio as mentioned in Nirbhaya framework guidelines. The Project cost to be funded by MoRTH under this Scheme will include costs towards the backend Software, Monitoring Centre equipment, space for setting up the Monitoring Centre, training, and helpdesk support for vendors and department officials, cloud service, map services, State/ UT's own manpower to be engaged for Monitoring Centre, state-level project management, and national PMU set up by MoRTH. Operations & Maintenance (O&M) charges for two years following the

commissioning of the system (refer section 8) will [also be part of the funding Scheme.
State specific requirements in addition to the AIS-140 standards can be taken up aspart of the project cost as per the requirement of the States/UTs.

5.2 Setting up of a PMU

MoRTH will set up a National Project Management Unit (PMU) through DIMTS Ltd. Toscrutinize State/UT applications seeking funds under the Scheme, to coordinatebetweenthe stakeholders, monitor implementation of the project and to verify implementation/operation reports submitted by the State/UT. The PMU will be set up immediately and it will be for a period of three years. Thetenure of the PMU can be further increased, if required.
DIMTS Ltd. as the National PMU for the Scheme will undertake the followingactivities:

- Scrutinize applications by States/UTs for funding under the Scheme
- Monitor the implementation of the Scheme
- Coordinate among various stakeholders including States/UTs, monitoringcentre, NIC, etc.
- Check/verify various implementation /operation reports submitted byStates/ UTs.
- Reconcile payments made by MoRTH to States/UTs against utilizationcertificates submitted by states/ UTs.
- Assist MoRTH in resolving queries/issues of States/UTs regarding compliance toAIS-1401 notifications issued by MoRTH/ other issues related to implementation
- Undertake periodic (quarterly) review of implementation of the Scheme acrossvarious States/UTs and give suggestions for improvement in the Scheme/itsimplementation
- Undertake periodic visits to States/UTs (once per milestone) implementing theproject under the Scheme to assess the progress at the ground level.

The PMU will comprise 3 full-time resources (one senior resource with 7 years plusexperience and two resources with 3 year plus experience) deployed by DIMTS atMoRTH. ln addition to the full-time resources, PMU will also be supported by othersubject matter experts provided by DIMTS for PMU.
The fees of PMU will be 2% of the Scheme value plus GST and would be part of theScheme. The fee will be payable to PMU as under:
1% of the total Scheme value payable on half yearly basis in advance in equalinstalment over a period of 36 months from the date of deployment of PMU;and Balance 1% of the project value payable along with release of milestone linkedfee to the states concerned for the respective projects, to be paid quarterly.

SCOPE OF THE PROJECT

The scope of the project shall be as below:

- Setting up the Monitoring Centre
  - Space for setting up of Monitoring Centre
  - Development / Customisation of backend software
  - Cloud Hosting & Deployment of backend software and map platform on NICCloud
  - Map data and services and along with its integration
  - Equipment at Monitoring Centre
  - Connectivity to Monitoring Centre
  - Helpdesk support
- State level project management for Monitoring Centre. The {State/UT} mayappoint a project management consultant (PMC) for project management.
- Manpower for operations of Monitoring Centre
- Training and capacity building
- operations and maintenance (O&M) of Monitoring centre for two years after its

Commissioning.

The costs towards the above scope shall only be considered as project cost for the

purpose of funding under the Scheme, as per the terms of this MoU.

6. Conclusion

Accordingly, all the specified public service vehicles shall be equipped with vehicle location tracking (VLT) device with multiple emergency buttons for requesting emergency response.

The {State/UT} shall set up a Monitoring centre for monitoring the alerts and health status of VLTD and emergency buttons fitted in the vehicles.The Monitoring centre will include a backend system for handling and processing the data and alerts (except Emergency button press alert) sent from the VLT devices fitted in vehicles.

The Monitoring centre shall be integrated with ERSS through a backend system, for handling the alerts generated by a passenger in distress, by pressing the emergency button fitted in the vehicles.

The project was cleared for the implementation in 53 cities with more than a million in population which, among other measures, will ensure installation of emergency buttons in public transport vehicles and video recording facility. The total estimated cost of the project is Rs 1404.68 crore which will be funded by Ministry of Finance from "Nirbhaya Fund".

7. References

- Guidelines provided by the mentor