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Implementation of Datalogger for Live Tracking of Vehicle Parameters Using Gsm-Gps for Security

K.Radhika, *Y.Murali Mohan Babu, G.Chinna Narasimhulu

Abstract: ***The state-of-art methods designed for object tracking are instant-based. No previous data will be stored in these methods. In current scenario, continuous tracking of the vehicle is important in providing more security, but the amount of data and power utilization will be high that affects the cost of the system. Designing and development of data logger tool will meet the demand. The track record for Trip, Ignition, Engine Temperature, Distance Travelled, Fuel consumption, Speed Violations, Engine Break Down Conditions, etc. are maintained by sensing the vehicle along with the Geographical locations and get stored in the data logger. The stored data provides more security for the rider as well as dependents and also for government organizations like RTO, Traffic department, etc., This work concentrated on data acquisition and vehicle automation using the Designed Server and Mobile Application for tracking and control. The current location of the vehicle, the speed of the vehicle, ignition on/off status, etc., can be tracked.***

Keywords: ***Datalogger; Tracker; automation; server transmission; mobile application; vehicle;***

I. INTRODUCTION

The user safety and security is important all the time. Tracking systems provide security to the user as well as for the vehicle. The sensors help the user to know about the condition of the vehicle. The navigation tool helps the user to guide the path for the ride. The communication tool helps the user or the well-wisher to know the vehicle's condition and to track it. The emergency message alerts the user and the registered members during the occurrence of sudden change of parameters due to vehicle failure, accidents, crossing geo-fencing, etc., Generally, the GPS and GSM based systems track the vehicle but never disclose any info about the past data. The size of these modules are large and synchronization between these modules fail at some situations where the system turns to idle. It uses multiple sensors for getting the parametric data for packet formation and transmission where chances of getting errors, clustering of wires is a problem. To maintain past track record of the vehicle, it is very difficult, even in the applications like OLA app, Yatragine app, etc., the Current trip can be tracked but cannot view the past trips. The present systems cannot support for right judgment in case of violation of laws during live rides.

II. PROPOSED METHOD

The proposed technique is a methodology of confining the complete collected data from the sensors in a systematic and organized manner with proper data logs such that it can be viewed and processed. It also supports the user with clear indications over the MAP of all the violations and problems that occurred and saves them as the recorded proofs. These proofs will support the Police Department, Traffic Department, Road Transport Department while the investigation of accident cases with clear data proofs such that the justice can be done for the right person. The data collected by the data logger also supports with the clear data of the violations of traffic with proper indications [1-3].

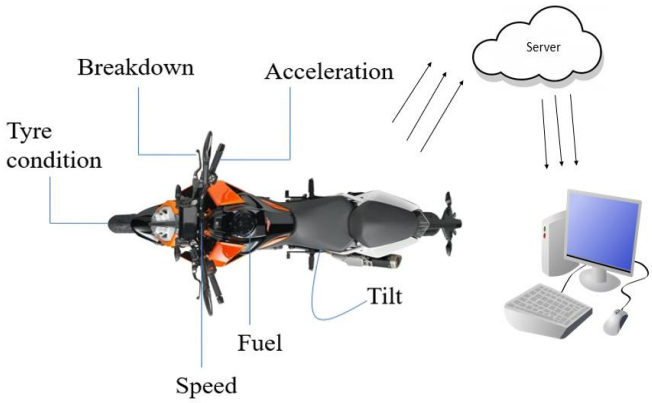

Fig.1 Vehicle tracking unit

This tracking concept can also be used for vehicle thefts. This helps the RTO to track expiry of vehicle's registration certificate from a single place. The proposed system for tracking is designed with the help of a server with which complete track of the vehicle as well as monitoring the parameters of the vehicle is achieved**.** This advancement enhances the user safety level and it is a gift for many families. This is developed with the GSM-GPS integrated module, speed track algorithm based on the change of latitude, longitude calibration as well as many other logical implementations for controlling the conditions of the vehicle. The flowchart for vehicle tracking is shown in Fig.2:

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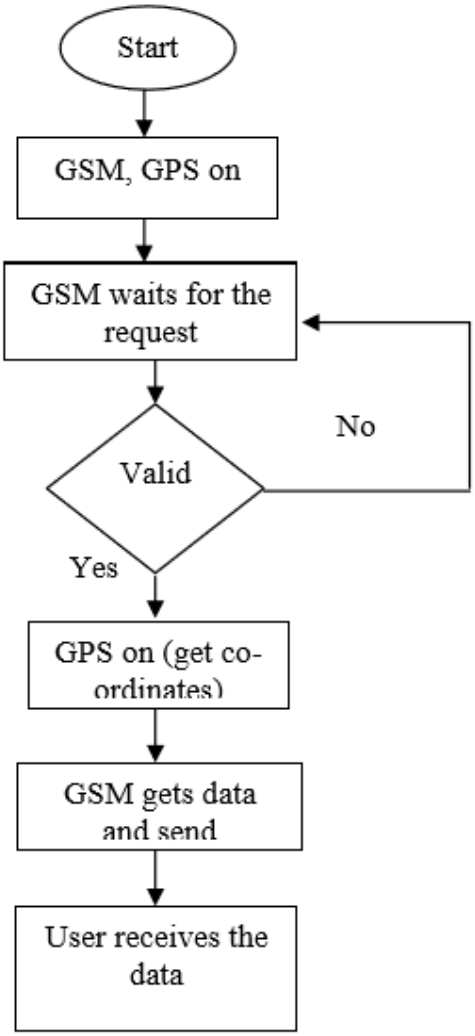

Fig.2: Flowchart for vehicle tracking

A) GSM-GPS MODULE

` The system permits localization of the automobile and transmits the position to the authorized user device on user's request, about the events that occur during vehicle parking. The system is integrated with a GPS receiver, a microcontroller and a GSM module. This module has the functionality of acquiring and transmission of information. The information contains vehicle and parameters status like engine status, speed, direction, engine on/off and excess speed limit alerts, crossings of a specific area [4].

By logging to the server, the system can be used as a navigation system. This technology is cost effective and is useful to track automobile location, vehicle theft. It enables monitoring of adolescent drivers by the parents [5-6].

The proposed solution can be used in other types of applications that require information at an irregular period of time. Tracking of moving vehicle can be done by different methods. Some of them are GPS (Global Positioning System) system, RF (Radio frequency) detection system, etc. The proposed method uses this service along with the embedded system to meet the requirement. This technology is a combination of hardware (motors, Relay and embedded parts) and software (AT commands and program for the microcontroller). Tracking of the vehicle location is done using the GPS, and SMS can be sent or received through GSM modem [7-9].

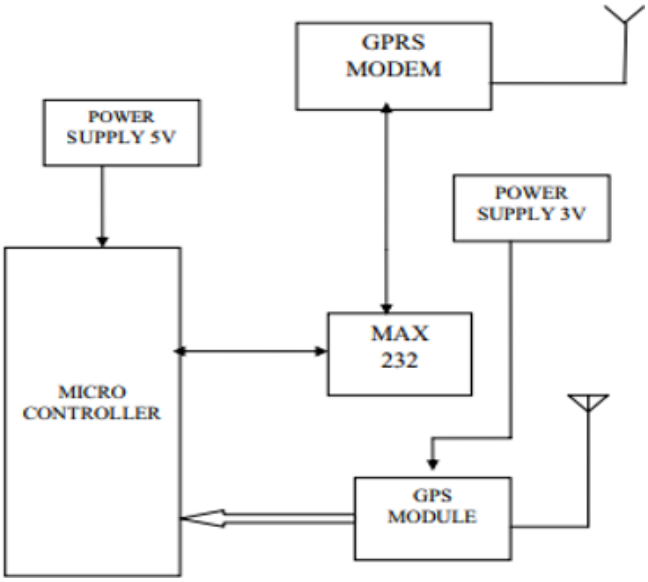

Fig.3 simple microcontroller interfacing with the GPRS and GSM modules

B) IN-VEHICLE UNIT

This is the important unit installed in the vehicle and it is responsible for capturing the following information of the vehicle:

- The current location of the vehicle
- The speed of vehicle x
- Ignition on/off status

This unit is also responsible for transmission of the above information to Tracking Server located anywhere in the world. The advantages of the proposed method are: Reduce operating expense, Save time, Reduce downtime, Optimize resources, Reduce insurance costs, Maximize vehicle utilization, Keep your customers happy , Be more predictable, Manage your field staff and drivers effectively, Optimize financial management, Superior route planning, Increase the number of trips, Locate your assets, Reduce maintenance costs ,Get timely Alerts, Improve Safety drivers, Utilize digital timekeeping, Reduce paperwork.The following are the applications of the proposed method:

1. Generally, when an industry manufactures the vehicles, it may export to different places across the world. If it needs the track of every device vehicle manufactured by it and their working condition, then they need do a survey. This is a very large and expensive process. If we use data logger in every vehicle, the company can easily get the data regarded to the vehicle.

2. A running vehicle may have different problems in different places. The data logger can easily support the problems faced by the user in different places sitting at any corner of the world [10-13].

3. When an accident occurs, the victim says one point and the accused will say one point. It will work very hard for the police department to find what exactly happened and will be trying hard for the proofs. Even the proofs can be manipulated by some people. In such cases data logger very helpful to the police department to identify the people who the mistake and who are innocent.

4. Not only to the vehicles, but this work can also be extended to home appliances. As an example like a washing machine. Homemakers may know how to work with a machine but not the process occurring inside it. If any problem arises they may notice it after a very long time and at that time, it may be difficult to attend the particular problem, or it may be costly. Providing data logger in these appliances, the company can notice it at the beginning stage and can send the serviceman to their homes, so that there exists a friendly relationship between the customer and company and it will the share market of the particular company.

III. RESULTS AND DISCUSSION

The proposed method can be implemented for Web applications and Mobile Applications. The explanation is carried out first web applications, later Mobile applications. The tracking of the vehicle for web applications is as follows:

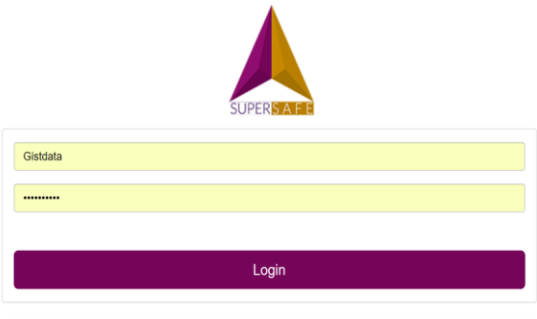

Fig4.1Log in a web page for tracking

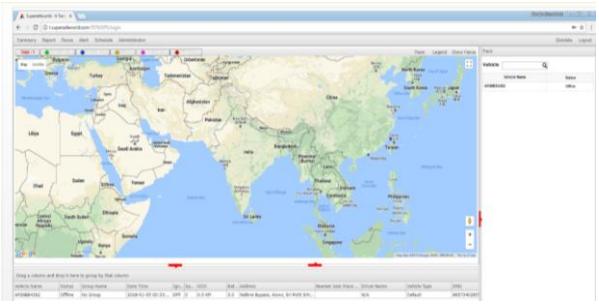

Fig4.2 Mapping of vehicle

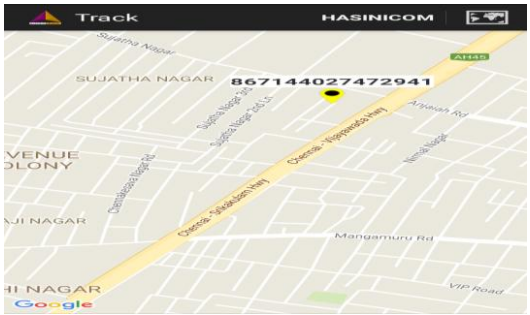

Fig4.3 Map view

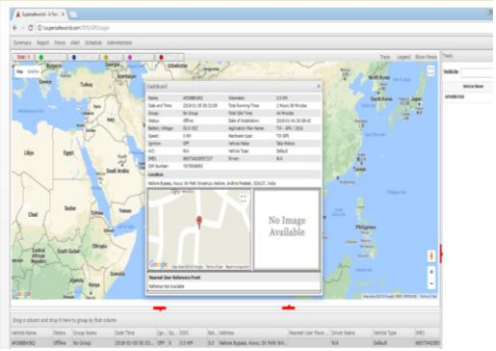

Fig4.4 History of vehicle

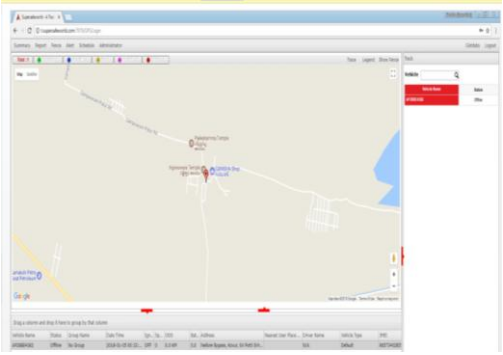

Fig4.5 Exact location of the vehicle

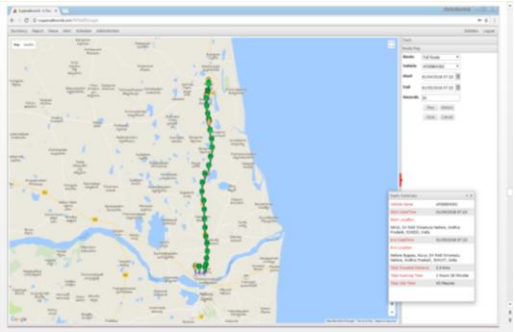

Fig4.6 Route map of the vehicle

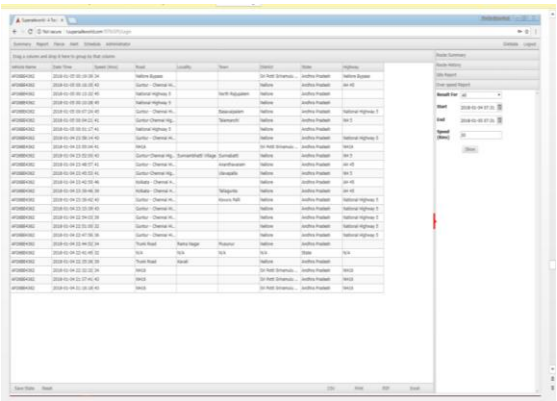

Fig 4.7 History of vehicle location

Fig 4.1 shows the login page of the server or the mobile app via which a user can view the logged data. Once the user login with valid credentials, the access to the logged information is approved and the mapping of the vehicle with its current status is shown as in fig4.2. To track the position of the vehicle the track position button can be pressed which results to figure 4.3. To find the complete history of the vehicle, the vehicle ID has to be pressed which results to fig 4.4 with the date of registration of the vehicle,

ownership of the vehicle details along with the present vehicle status and its location address. To extract the location of the vehicle, the selection of the location detector can be used which results to fig 4.5. To find complete root map od the vehicle with respect to the ride, root map button can be enabled which collect the information from date and time to to-date,that results to the fig 4.6 to get the complete logged information about the coordinated, speed, sensed data with respect to date and time along with the location address can be viewed and downloaded by selecting the logged info from fig4.2 which gives as on figure4.7.The tracking of the vehicle using Mobile is as follows:

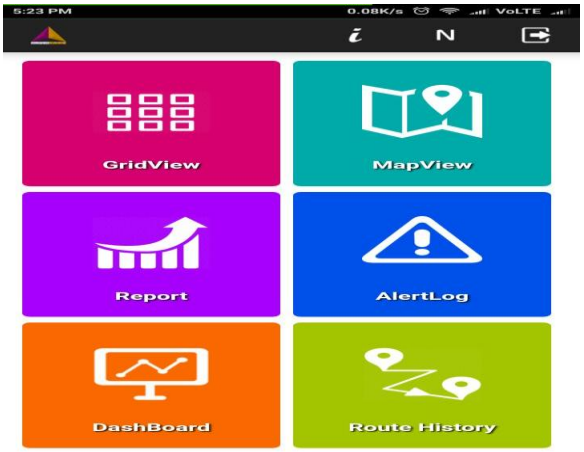

Fig 5.1: Mobile App

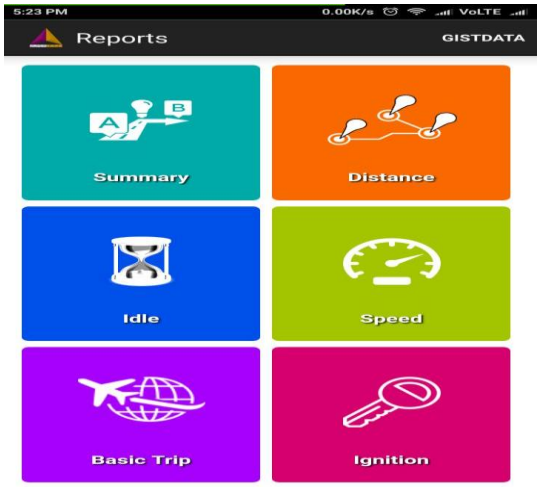

Fig 5.2: Mobile view of reports

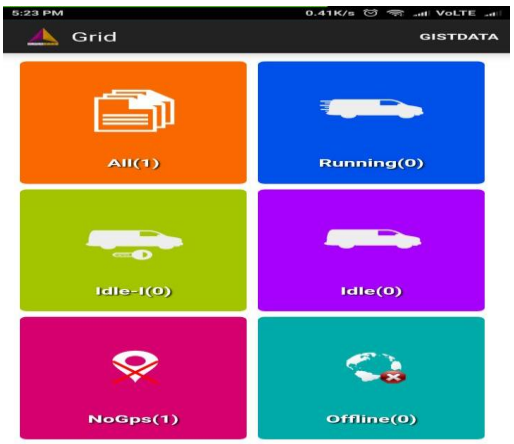

Fig 5.3: Grid view data

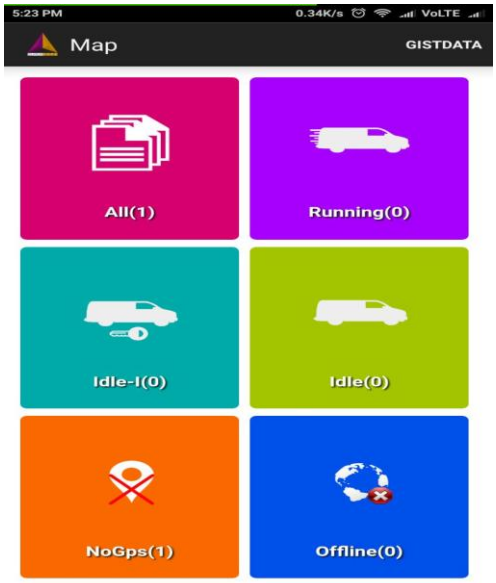

Fig 5.4: Map view details

Fig 5.5: Map view on Mobile

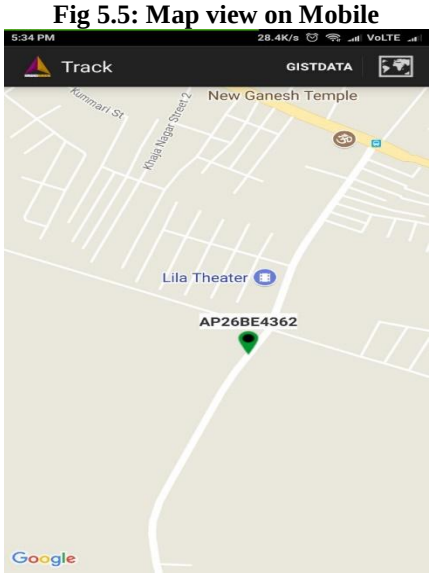

Fig 5.6: Location of the vehicle in Mobile

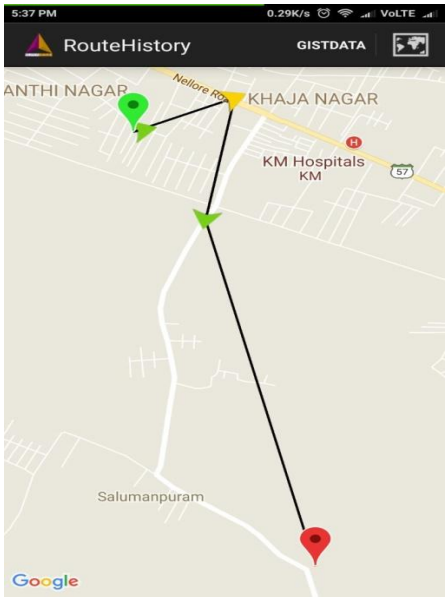

Fig 5.7: Route history

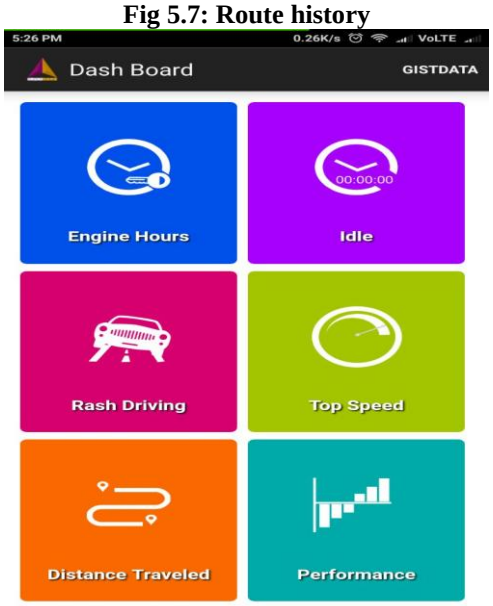

Fig 5.8: dashboard details

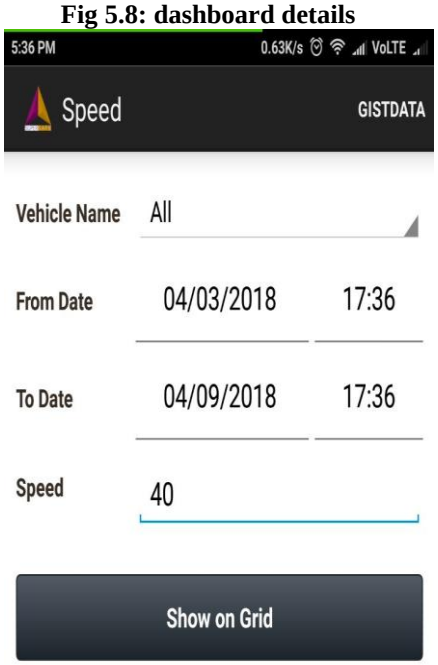

Fig5.9: Speed details

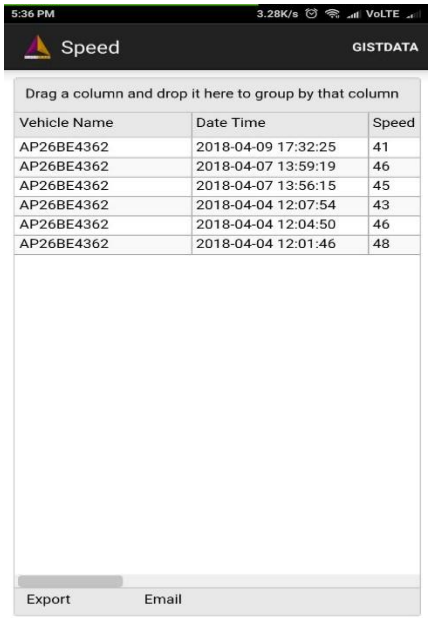

Fig 5.10: Speed report

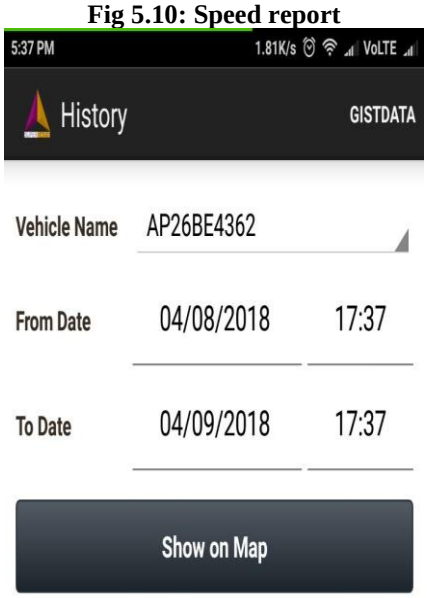

Fig 5.11: History report

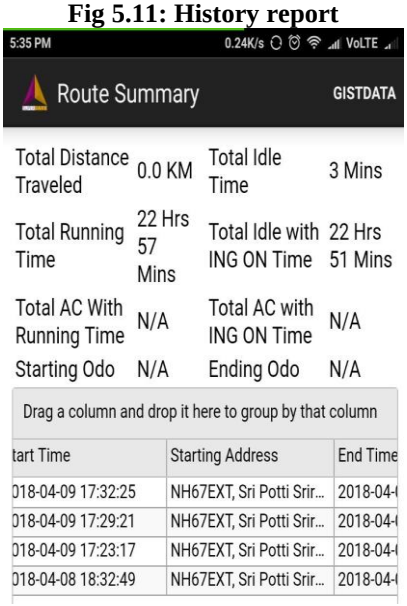

Fig 5.12: Route history

Fig 5.13: Grid data

In successful authentication of the mobile app, a dashboard as fig 5.1 is shown. When the report of data logged need to be viewed the report selection button on the dashboard leads to the figure 5.2. Upon selection of summary, the page is viewed as on fig 5.3 & 5.4 with an indication of the total number of vehicles and their status to view the map view and locate the vehicle the selection of appropriate status button in the map view data need to be selected which results in fig 5.5 with the location details app in fig 5.6. On selection of distance in the dashboard of report fig 5.7.If viewed on the selection of dashboard new other features can be viewed as in 5.8. Based on which 5.9 to 5.13 will be displayed based on the selection of the elements on the dashboard. The engine hours, idle hours, top speed of the vehicle can be witnessed on the selection of engine hours idle and rash driving with performance buttons on the dashboard.

IV. CONCLUSION

The paper is all about rider safety and vehicle security. Vehicle security is accomplished by the use of GPS, GSM technology and a web application and is simulated by PROTEUS software. This technology is beneficial for Parents to view past track record of the children. It also helps for delivery services, to track animals in jungles, to easily perceive the accused by the police department, to notice Engine replacement malpractice, recycling of the expired vehicular parts.

This paper can be further enhanced by the use of camera and by developing a mobile-based application to get the real-time view of the vehicle instead to check it on PC, which would be more convenient for the user to track the target.This paper can obtain vehicle condition survey very easily on different types of regions and roads with the logged data and also determine which type of vehicle is useful for geographical regions and roads. Here not only sense the vehicle parameters but also vehicle automation is accomplished with a clear track record using the designed server and mobile application.

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