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Fleet Management System

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Abstract: Nowadays, various organizations that are related with transportation or vehicle management are focusing on making the use of tracking system in order to track the real time location of a particular vehicle. But in various organizations where this system is required such as school buses, public transportation, etc. The lack of security is a major issue. Fleet management in our country is found to be quite complicated, time consuming and costly process. According, in order to overcome these issues it is necessary to introduce automation. So the aim of our project is to overcome the drawbacks of current fleet system and try to improve its performance. In order to make system automated the methods used are tracking of truck through GPS, generating notification based on its location, generating automatic journey logs.
Keywords: (FLEET, GPS/GPRS, VANET, LTE, RSU, GSM, OTP)

I.   INTRODUCTION

A fleet can be referred as the collection of vehicles – Trucks, cars, buses, etc. Where all of these vehicles co-operate for a common purpose. The vehicle fleet management involves administration of vehicles in various aspects.

Fleet management allows the companies that are related with transportation to minimize the risks related to improving transportation efficiency and minimize amount of human devotion.

In one of the existing system, the network topology is used for the proposed model. The RSU (Road Side Unit) is used as a wireless LAN access point, in VANET communication. The information of this proposed model is in electronic road database LTE (Long Term Evolution) connectivity is used to send an interrogation message to the traffic monitor center. This system was capable of optimizing the road capacity, decrease the number of accidents, low fuel consumption and reduce emissions. The drawback of this system is automated merging, lane changing joining and leaving the platoons.

In another existing fleet management system, it was found that the use of Linux based embedded microprocessor was done, GPS receiver is interfaced for vehicle location tracking, GSM-GPRS modem is used for communication and for security purpose a physical panic button, biometric sensor, camera and speakers are used [16] [17]. One dedicated server was required for data acquisition and a GUI renderer is created for user interface. The main drawback of this system is that it is platform dependent.

In a survey done by cognizant, it was found that among the biggest challenges the fleet management system face today is maintaining the delicate balance of increased material and transportation costs against the expectation of service levels mandated by customers. To achieve better customer service at reduced costs, organization are increasingly adopting the two levels of process improvement and technological breakthroughs is track-in trace, improved control system and IT innovations such as cloud platforms. This survey said that the visibility of the current system is limited and has a higher running cost. It is comparatively less flexible.

The proposed system focuses on tracking of vehicle (truck) by means of GPS and submission of the trip details through the web portal or android app. This will probably help in reduction of human devotion and maintenance of huge log of papers. Automated calculations of trip expenses and data analysis and report generation which will help organization to know about companies profit.

II.   LITERATURE SURVEY

International Research Journal of Engineering and Technology in Tracking and Recovery of the vehicle using GPS and GSM. The proposed system provided vehicle security and mechanism to handle emergency situation [16]. But the drawback of the system was its higher running cost and also this system was limited for bikes only [8].

International conference of interdisciplinary Engineering in Fleet Management System for Truck Platoons. The proposed Intelligent Transport System requires real-time and high quality traffic information. This system generates an optimum route in terms of fuel consumption. But the limitation of it was automating merging of trucks and joining and leaving platoon is difficult [1].

 Anand kalathi et.al.in Maximizing Supply Chain Performance in the Transportation and Logistics Industry. The proposed system provided the Commercial as well as on-demand visibility solution. But the limitation of it was higher running cost and it was not much flexible [11] [12].

Fabio da costa Albuquerque et.al.in A Proactive Application to monitor truck fleets. The working of this proposed system was automated. It provided traffic analysis, timely delivery at the site, and was efficient. But the major drawback of this system was that it was really very costly [18].

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Management and Security System. One of the important advantage of this system was in case if GSM network coverage is lost, program is written to detect and to store data in internal database and once GSM network coverage available it will transmit data. But it has a major drawback of being platform dependent [10].
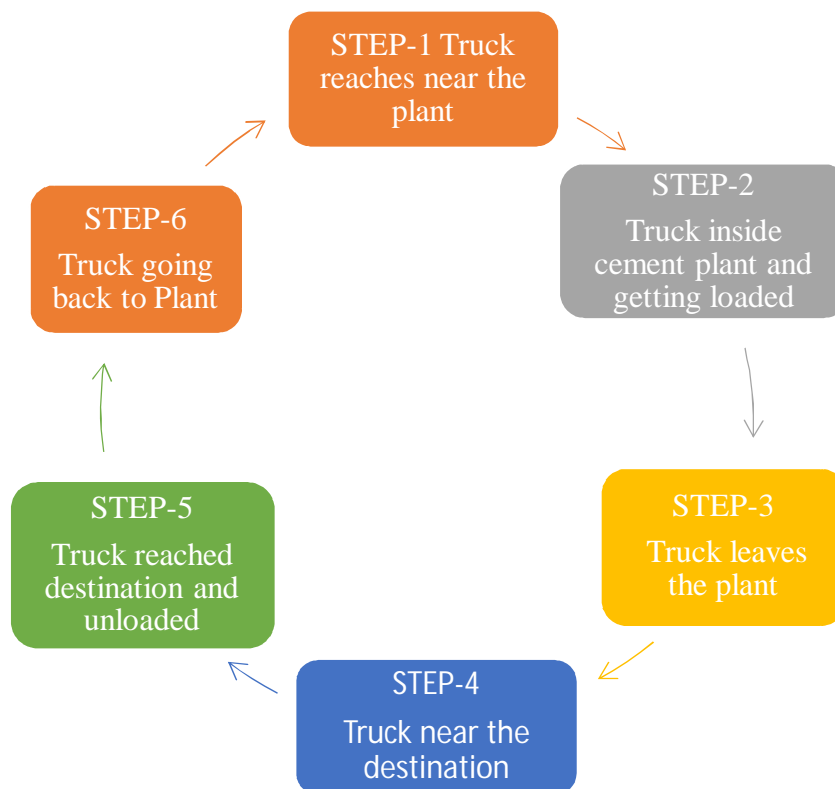
III.   IMPLEMENTATION

Fig. 1 System Workflow Diagram

A.   Admin logs into his web-portal account.
B.   Admin creates the new driver, staff, truck and client.
C.   Client logs into their android application account.
D.   Places the order according to their needs by specifying number of bags of cement required, probably when the delivery needs to be planned, etc.
E.   Admin receives the order placed by the client, checks for the requirements, checks the driver that is free for that particular journey and assigns the trip to that driver.
F.   Driver checks the order that has been assigned to him by the admin on the android app.
G.   Clicks on the start button on the app while starting the trip.
H.   In case there is a need to refill the fuel or make any other sort of transaction, will click on the expenses tab on the android app and enter all the valid information there.
I.   The client as-well-as admin both can make the real time tracking of the truck that is on journey.
J.   When the client finds out that the truck has reached nearby, he will make all the arrangements to unload the truck.
K.   After receiving the commodity, client will click on the complete button on his android app so that the driver will be now visible in the available drivers list to the admin and he can assign a new journey to the driver.
L.   In case, any mishap takes place during the journey in order to notify the admin the driver will press the panic button.

M. The panic alert will be showcased on the admin portal as well as he will get a notification message on his cell phone.

N. The report for the journey can be maintained as a document for reference purpose.

O. The monthly expenses can be shown as a document in order to keep a track of profit or loss.

P. Data stored in central location and can be accessed from anywhere.
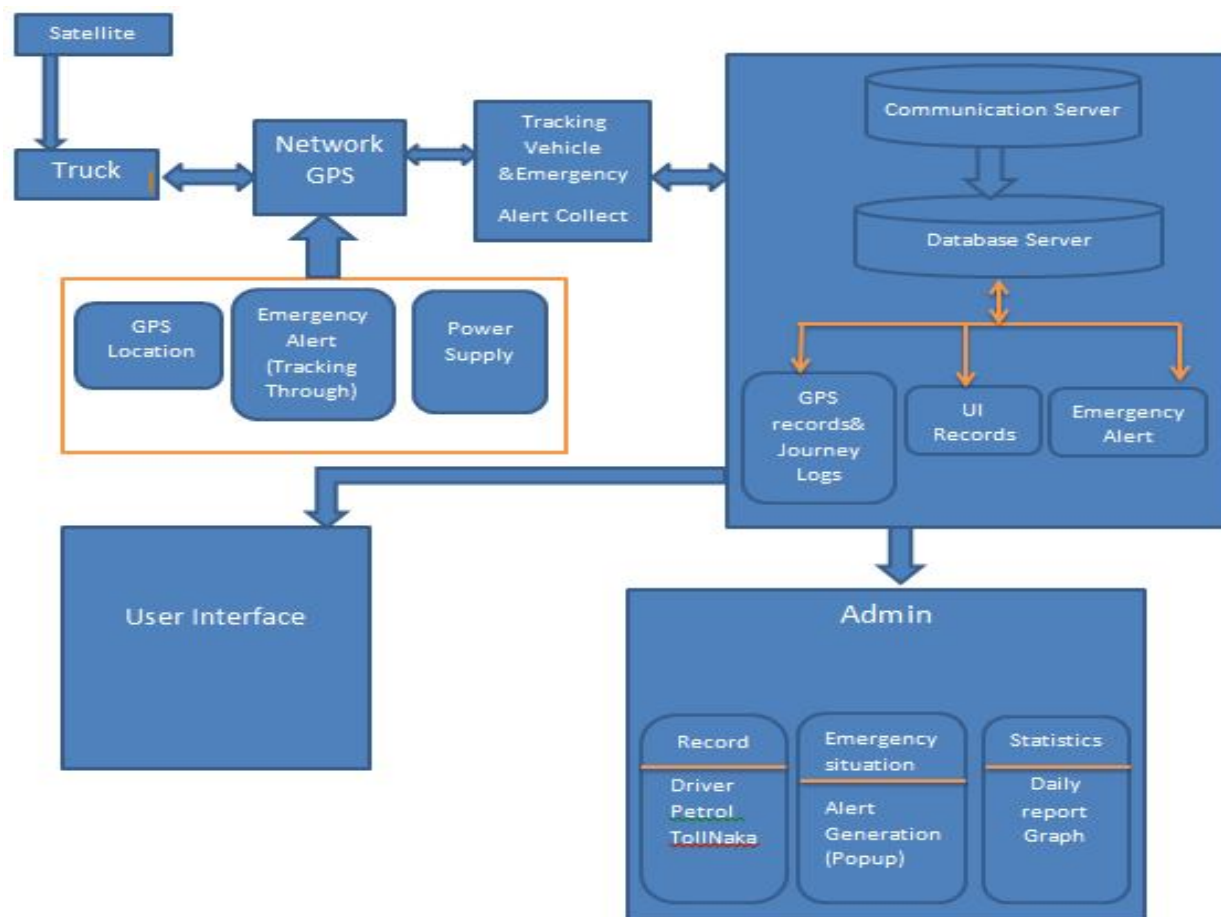
IV. SYSTEM ARCHITECTURE

Fig. 2 System Architecture Diagram

In today's world it is very important to make proper management of the vehicles, but care must be taken that along with the vehicles the data related to the expenses and route of the vehicle must also be stored.

Our focus is on implementing one such model that will not only store the vehicles data but along with that it will store the data related to the driver who was driving it at a particular moment of time and also the expenses needed during the whole journey As the workload increases the human devotion needed to handle the task also increases. But our focus is on reducing human workload by introducing automation, for this given are the modules that are taken into consideration for initial working.

The System architecture of Fleet Management System is divided into three parts

A. Tracking System

Tracking system is nothing but the phenomenon which consist of satellite, network GPS, power supply, tracking of vehicles and emergency alert generation and collection. In proposed system Global Positioning System (GPS) is used to track and study the vehicles in the fleet at any time. GPS is satellite base radio navigation system. The vehicle's real time data is transmitted through satellite to the client and the admin accessed the data by logging on the website. GPS information picked up by each tracking device through the tablet phone network and sent it to the tracker system which provides a live vehicle location. Tracking system can shows the direction and speed of a vehicle and as well as its live location.

Vehicle tracking system is the most basic function of Fleet Management System. Vehicle tracking component is usually GPS-based platform. In proposed system truck tracked over GPS. Then GPRS alert is generated within 20 km range sent across. So transport staff prepare and line-up truck in advance. Driver submits the previous journey delivery details and transport staff enters details in the system. Transport staff enters the data in the online system with automatic serial number which is generated for new journey.

B. Database

Proposed system have one communication server. The socket communication server is the central server component. The communication server communicates with the tracking system. The communication server is capable of communicating with multiple users. It uses custom defined application level protocol for data transfer.

When a remote tracking device is connects the communication server will authenticate and acknowledge the user. Then the server will proceed to receive the information from the user's or remote tracking device and will store them in the database server.

Database is accessible by both android mobile application as well as web application. It is responsible for storing all operational data generated by Mobile application and web application. Data stored in central database and can be accessed from anywhere.

C. User Interface

In proposed system user interface will develop for truck driver, client and admin also.

Web application is created for the admin. The web application will retrieve the data from database server. Then the web application do the preprocessing on the retrieved data for further operations as requested by the admin. It is the main management tool of the system. Admin can log in to the system via this application and gain access. Admin have rights to add, delete and modify truck as well as driver details user interface which is provided to him.

Mobile android application is developed for driver as well as client use through which continuous tracking of vehicle, online transaction for petrol pump and tollbooth emergency alert will be done. Mobile application will be having driver as well as client login. Driver can login and start/end his trip. This application can be also used to provide messaging, warnings and help to the driver. Warnings can be is used if schedules are not being followed.

Client can log in to the application and place an order, display all orders and continuous tracking of driver is done. Client can display all completed and pending orders. Client can be able to see driver's live location during the trip. Client can have complete trip button on his application interface. Whenever order is delivered successfully to client he can press that button and admin will get notification.

V. FUTURE SCOPE

External Hardware can be added for handling emergency situation. External GPS device can be added for continues tracking of truck. Traffic analysis for generating optimum route. RFID can be added for identification purpose as well as tracking the device. Traffic management, route optimization can be achieved by adding some more logic. Money on fuel can be saved and productivity can be optimized through efficient Fleet Management Software. Tracking system can be used for planning a refuel location.

VI. CONCLUSION

Fleet Management comprises of a wide range of functions, such as vehicle financing, vehicle maintenance, drive management, fuel management, safety management, speed management, etc. Amongst which, we have successfully implemented driver management, client management, journey log management, staff management, real-time vehicle tracking, panic alert management, security management.

These all aspects are very important in business to remove or minimize the risk associated with vehicle management, improving efficiency, staff management, providing security , increasing productivity, etc.

Hence, we conclude that various challenges faced by the existing system were overcome by mean of introducing automation.

REFERENCES

[1] www.sciencedirect.com]
[2] http://www.paolocorti.net/
[3] Ulhas Patil, Pranal More, Rahul Pandey, Prof. Uday Patkar, "Tracking and Recovery of the vehicle using GPS and GSM", Proc. International Research Journal of Engineering and Technology (IRJET), Mar-2017.
[4] Nicolae Stancel and Maria Claudia Surugiu, "Fleet Management System for Truck platoons-generating an optimum Route in terms of fuel consumption," Science direct, Proc.10th International Conference Interdisciplinary in Engineering, INTER-ENG 2016.

[5]   Channakeshava Gowda V R, and Gopal Krishna K,"Real Time Vehicle Fleet Management and Security System," Proc. 2015 IEEE Recent Advances in Intelligent Computational Systems (RAICS), 2015.

[6]   "KPI-Driven Supply Chains: How to Master Complexity, Optimize Inventories and Meet Rising Customer Expectations," white paper, CDC Software

[7]   Chris Caplice, Yossi Sheffi, (1995) "A Review and Evaluation of Logistics Performance Measurement Systems," International Journal of Logistics Management, Vol. 6 Issue 1, pp.61 – 74.

[8]   iWow GP-810 GPS Module product hardware technical Specification , released 22nd March 2006,

[9]   Michael Worboys, Matt Duckham, CIS: A Computing Perspective, 2nd Edition, CRC Press, 2004.

[10] Nimalika Fernando, Sirimevan Widyasekera, Lalith Gamage, Dileeka Dias "Study on feasibility of practical use of low cost GIS tools in the context of Sri Lanka tor preparation and distribution of digital spatial data" Annual Conference of the Computer Society of Sri Lanka, 2007

[11] S. Vanjale, P.B. Mane, S. Thite Elimination of Rogue access point in Wireless Network", International Journal of Scientific & Engineering Research, Volume 4, Issue 12, December-2013

[12] S. Vanjale, S. Thite, "A novel approach for fake access point detection and prevention in wireless network", International Journal of Computer Science Engineering and information,Technology Research (IJCSEITR), Vol 4, Issue 1, Feb 2014, 35-4

[13] Albuquerque F. da C., Barbosa I., Casanova M. A., Carvalho M. T., Macedo J. A.: Proactive Monitoring of Moving Objects, Proc. ICEIS 2012, pp. 191-194.

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