Smart Goods Transportation system using Internet of Vehicle

Sunanda More[1], Shraddha Pawar[2], Lalita Gavit[3]

1,2,3 Student DEPARTMENT OF COMPUTER ENGINEERING Nashik District Maratha Vidya Prasarak Samaj's Karmaveer Adv. Baburao Ganpatrao Thakare College of Engineering, Nashik-13

Abstract- **Nowadays, the concept of the smart cities became more popular. The evolution of internet of things helps the idea of smart city more achievable. A major branch of smart city is the smart transportation/. Problem such as fuel theft, accidents, drink and drive can be resolved by the IoT. The system checks for change in GPS coordinates of the vehicle when not being used by the owner. Once the location of vehicle changes, owner is notified via text SMS Message. The text SMS message consists of current GPS Location of vehicle and also a warning message. The owner then sends a SMS, which instructs the microcontroller to turn OFF the vehicle by switching the relay supply of the battery of the vehicle. The enviable advantage of this system is that it helps the owner in tracking the vehicle at a greater pace, and reduces the complexities compared to other systems, besides being a cheapest alternative for anti-theft system as well. In this system we design the smart transportation system for the car and transport owner using the various sensor and cloud storage. This system will detect theft of fuel and alert the owner of the truck. The owner can also locate the vehicle using the text message. This system will reduce the accident occurred in transportation.**

Index Terms- Cloud storage, Flow sensor, MQ-135, Nodemcu, PIR sensor, Ultrasonic sensor, Vibration sensor

I. INTRODUCTION

Transportation is a very dynamic market and entails a great potential across many industry verticals. The advancements in technology due to the never ending RD in this sector makes it one of the prominent segments in the current IT industry scenario. The components, devices, and products have continuously developed from their traditional operations to meet the demands of the growing IoT technology. The software has a major role to play in this sector due to the cost effective matrix, and it leads to a longer life cycle of devices and systems with greater reliability.

The highlighting features of IoT in transportation include higher efficiency, better properties to withstand rough environmental conditions, and a longer life that is best-suited for multiple transportation applications.

The report describes the market trends, drivers, and challenges with respect to the IoT market in intelligent transportation systems and forecasts the market till 2020. This global report gives a detailed view of the market across geographies The Americas, Europe, Asia-Pacific (APAC), Middle East, and Africa. The Americas is the largest geography in terms of the IoT market in intelligent transportation systems value. APAC has been identified as the fastest growing region. Europe has a very promising market, while the Middle East and Africa are also impetus to the growth. The report profiles 10 promising players in the IoT market in intelligent transportation systems.

The key players operating in the global IoT in transportation market include Alcatel-Lucent, ATT Inc., Garmin International Inc., IBM Corp., Denso Corp., Thales Group, General Electric, Verizon Communications Inc., Cisco Systems, Inc., and Tom-Tom N.V. These players have expanded their market presence by adopting various business strategies such as acquisition, geographical expansion, product development, strategic alliance, and collaboration.

Growth in Information, Communication, Technology (ICT)as per the report published by World Bank, the minimum internet penetration rate is 15% in the least developed countries of South Asia and Sub Saharan Africa. Further, technological innovation drives the development of Information Communication Technology (ICT) infrastructure.

Decrease in the Cost of Sensors Controllers the increase in internet penetration, infrastructural development, growth in demand for automation and

analytics are the factors that reduce the cost of powerful sensors and controllers used in the transportation sector. Furthermore, various tools and software provided by the key market players is used to optimize devices that helps reduce costs and manages the connectivity of devices effectively. Government Expenditure for Smart Cities and Smart Transportation Systems in Several Developed and Developing Regions IoT in transportation is an ongoing trend in business intelligence and analytics, owing to the growing acceptance of this acceptance and increasing utilization rate across the globe. However, high costs associated with the implementation of this system across enterprises hamper the market growth. The government of several developed developing countries has invested and supported IoT usage in the several developed and the developing regions especially Asia-Pacific, North America, and Europe. Public transport is a service available on sharing basis for the benefit of general public. It includes city buses, trolleybuses, trams, passenger trains, ferries and rapid transit like metro and subways. Unlike transportation modes like carpooling, rickshaws and taxis, this system encompasses an entirety of strangers. The main reason why the people choose public transportation over other modes of transport are its subsidized rates, environment-friendly attributes and easy accessibility. Firstly, public transport is very economical allowing a large population to have access to it. Using a bus or a train to commute is comparatively cheaper than using a private car. If people have their own car, they have to spend a lot of money on fuel, car servicing, repairs, and insurance. There are many discounts available for some individuals, like students and senior citizens who choose public transport as their transportation option to get to work or to school. Secondly, public transport can preserve the environment by reducing the amount of pollution. With an increase in the use of public transportation, there will be a reasonable dip in the number of private vehicles on the road, therefore, improving the environment and in addition, solving the traffic congestion issue[10]. Furthermore, public transportation has good accessibility in big cities, making it easier to travel to any part of the city, making buses a favorable option. It provides personal mobility and freedom for people. Taking into consideration the other aspects of public

transportation, there are some downsides to this service as well. Public transportation, by its very nature, is far more time consuming than any other mode of transportation.

Most trains and buses run in accordance with a scheduled timetable. The offered goods transportation services are delivered for the movement and transport of goods. Our offered goods transportation services are rendered by the most experienced technicians of the domain. The offered goods transportation services are available at very competitive market rates. However, these time schedules are seldom followed. There is always an uncertainty regarding the arrival of a bus. Often, buses break down causing further problem to commuters. Another pitfall we see is that public transportation often lacks organization. Commuters are often confused with regards to bus routes and bus stops. These systems have the potential to deliver significant benefits with respect to operational efficiency, service reliability, infrastructure management, as well as enhanced safety, reduced environmental impact, and valuable information services for transport users. The range of systems include those for: 1.accident management, 2.support for public transport operations, 3.demand management, 4.traveller information and trip planning services, 5. freight and eet management, 6.-incident management and support for emergency services.

India has been building roads since ancient times as is evident from the Harappan civil isation.As per 2017 estimates, the total road length in India is 5,603,293 km (3,481,725 mi);making the Indian road network the second largest road network in the world after the United States. At 0.66 km of highway per square kilometre of land the density of India's highway network is higher than that of the United States (0.65) and far higher than that of China's (0.16) or Brazil's (0.20).India has a network of National Highways connecting all the major cities and state capitals, forming the economic backbone of the country. As of 2013, India has a total of 70,934 km (44,076 mi) of National Highways, of which 1,205 km (749 mi) are classified as expressways.

1.2 Motivation
1. Current Indian transportation system
2. Increasing accident count day to day

3. Theft of goods and fuel while transporting by drivers

II.LITERATURE SURVEY

No.	Author	Publication	Year	Paper Title	Advantages/disadvantages	Review
1	Mucahit Haluk Eren	IEEE	2016	Smart Driving in smart city by Mucahit, Haluk Eren	Used the biological data of drivers to integrate to system. we cannot store each and every driver for single car.	Intelligent driver assistant systems and driver less cars can be built to exhibit similar behavior to an actual driver. Further, it reduces the possibility of accidents enabling comfortable travel.
2	Somchok, Juladis	IJETA	2015	IoT solution for bad habit of car security by Somchoke Juladis	Processing speed is fast Failure of network	Apply the Internet of Things (IoT) to detect these habits and use mobile applications to monitor and alarm the owner. We will name of mobile application "car Alert"; which alerts you when you forget to turn off the car lights or close the windows when the engine is off.
3	By Joel C McCall and Mohan M. Trivedi	IEEE	2007	Driver Behaviour and Situation Aware Brake Assistance for Intelligent Vehicles	Accident reduce, Effectively detect over speed situation. Difficult to use in mixed traffic.	By using sensors that capture the drivers intended action.
4	H.avan N.Bird	IEEE	2011	Driver activity monitoring through supervised and unsupervised learning	Low cost wrong information may occur	Detect driver activities that are not safe, such as talking on a cellular telephone or adjusting the dashboard radio system.

III. SYSTEM DESIGN

3.1 System Architecture

The system is consisting of the various sensors, microcontroller and google application programming interface. The motion sensor detects whether the human or any motion is detected in the container area after activating the sensors if any motion is detected then it will notify the owner with the messages. If the accident is occurred, the vibration sensor will send the alert or sos notifications to the police station. The alcohol sensor also sends the alert notifications to owner and police if the driver is drunken more than the official limit. This all data is stored in the cloud database using the nodemcu microcontroller using Internet. We can also display the current location of the vehicle using latitude and longitude using gmap api. The vehicle history is also stored in the log of system, so we can traced out the vehicle travelled in whole day.
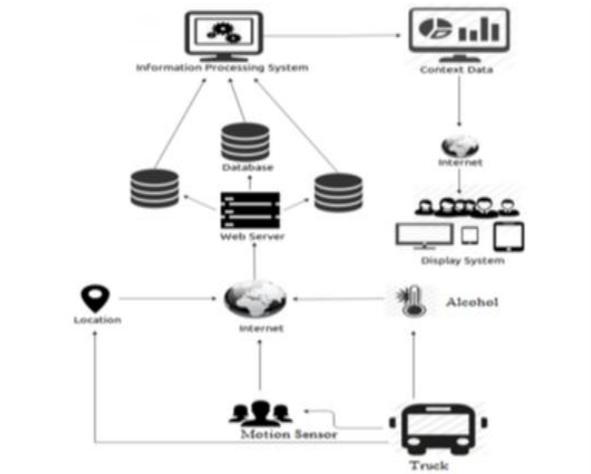

Figure: System Architecture

V CONCLUSION AND FUTURE WORK

A .Conclusion

We want to implement system which secures delivery of the goods in Indian Transportation system. The

proposed system also includes the driven alcohol detection, accident detection system as well as the ultrasonic sensors to protect the vehicle. If any emergency is occurred the owner of the vehicle will get notified by text notifications. We feel that our system serves something good to the society and like to present it before the prosperous world.

B. Future Scope

In future, current and growing awareness of the importance of security, trustworthy vehicle autonomous systems can be deployed in few years. Smart car systems will also be designed and developed according to citizen needs as a part of intelligent cities. Therefore, it can be understood that smart phones are indispensable parts for these types of systems. With development of wearable intelligent technologies, human biological data can also be integrated into the intelligent system. In this way, systems can be developed so that it can better recognize drivers in the future, and are more likely to predict possible driving behaviors. Thus, intelligent driver assistant systems and driverless cars can be built to exhibit similar behavior to an actual driver. Further, it reduces the possibility of accidents enabling comfortable travel.

APPENDIX

Appendixes, if needed, appear before the acknowledgment.

ACKNOWLEDGMENT

We express our heartily gratitude towards respected guide Mr. B. S. Gholap and head of department Dr. V. S. Pawar for his valuable guidance, profound advice, persistent encouragement and help during the completion of this work. His time to time helpful suggestions boosted us to complete this task successfully. He has helped us in all possible ways right from gathering the materials to report preparation. We express our thanks to our Project Coordinator Mrs. R. P. Chandwadkar for his kind cooperation for providing all kinds of cooperation during the course. Our sincere thanks the Principal Prof. N. B. Desale for his inspiration. Finally we are thankful to the supporting staff of computer department and all those who directly or indirectly contributed to complete this work.

REFERENCES

[1] Alvin. (2014, February 18). 3G + GPS Shield for Arduino [Online]. Available:http://linksprite.com /wiki/index.php5?title=3G GPS Shield for Arduino

[2] Amazon web services. Format carrying out messaging of Cloud MQTT [Online].Available: https://www.cloudmqtt.com/docs.html

[3] sKlara Nahrstedt. \Keynote: Internet of Mobile Things: Challenges and Opportunities," in 2014 23rd International Conference on Parallel Architecture and Compilation Techniques (PACT). bibitema M.F. Haider, B. Kanning, and S.F. Peik, \Wireless Energy Autonomous Light Sensor for Automotive Applications," in 2016 IEEE Intelligent Vehicles Symposium (IV)., 2016, pp. 619-624.

[4] Marco Schwartz (2013, 26 March). Smart Lighting using Arduino and a Photo cell [Online].Available:https://openhomeautomation. net/ smartlighting-arduinophotocell/

[5] Tanvi Banerjee and Amit Sheth, \IoT Quality Control for Data and Application Needs," in IEEE Intelligent Systems., 2017, pp. 68-73.

[6] Xinguo Li, Yi Wang, Ting Fan, Dongmang Zhang and Hong Liu. \Online Sound Event Detection and Recognition Based on Adaptive Background Model for Robot Audition," in 2013 IEEE International Conference on Robotics and Biomimetics (ROBIO)., 2013, pp. 10891094.

[7] Y. Faridah and W M Amir Asyraf W Abdul Rahman. \Car Alarm Detection Device," in 2016 IEEE Symposium on Computer Applications Industrial Electronics (ISCAIE)., 2016, pp. 195-199.

[8] Arduino. Arduino Mega [Online]. Available: https://www.arduino.cc/en/Main/arduinoBoardM ega

[9] Arduino. Sound Sensor Example [Online]. Available:http://www.arduino.org/learning/tutori als/boards-tutorials/sound sensorexample

[10] Byron J. (2014, 27 February). Sound Detector Hookup Guide [Online]. Available: https://learn.sparkfun.com/tutorials/sounddetecto r-hookupguide

[11] Fabio. (2010, 29 July). Pushbuttons and tilt sensor/switches: how they work and some Arduino usage examples [Online]. Available:http://www.varesano.net/blog/fabio/pushbuttons

[12] Forrest Stroud. What Is Internet of Things [Online]. Available:http://www.webopedia.com/TERM/I/internetofthings:html