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Tracking System And Accident Detection

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ABSTRACT: GPS is one of the technologies that are used in a huge number of applications today. One application is tracking MTC bus and regularly monitoring them. This tracking system gives information about the location and route travelled by MTC bus. This information can be observed from any other remote location. This system uses GPS and GSM technologies. It also includes the web application that provides us exact location of target. This system enables us to track target in any weather conditions. This paper includes the hardware part which comprises of GPS, GSM, Linkit one pin out, 16x2LCD, software part which is used for interfacing all the required models and web application is also developed at the client side. Main objective is to design a tacking system that can be easily installed and to provide platform for further enhancement.

KEYWORDS: GPS, GSM, Linket one pin out, vibration sensor, button/sensor.

I. INTRODUCTION

The vehicle tracking system is used in a wide variety of applications. Most of the tracking systems use geographic position and time information from the global positioning satellites. GSM (Global system of Mobile Communications) and GPS(Global Positioning System) based vehicle location and tracking system will provide effective, real time vehicle location, mapping and reporting [2]. It also provides the most up-to-date information about the ongoing trips. This system incorporates a hardware device (GPS receivers) installed in the bus. The GPS unit placed in the bus receives signal from any four visible satellites among the constellation of satellites in the space. The GPS unit consists of a receiver, a controller/processing unit and a communication interface.

The basic function of the device in the bus is to acquire and transmit the position of the bus to the server at a fixed interval of time. Microcontroller unit forms the heart of the tracking unit, which acquires and process the position data from the GPS module. The communication interface is responsible for receiving the signals from the satellites and sending the information to the server [1].

The Vehicle Tracking System developed by C-DAC, Thiruvananthapuram employs a GPS (Global Positioning System) receiver to identify the location of the vehicle and transmit the information to the base server over the GSM (Global System for Mobile Communication) network[5].In paper [3], architecture for tracking the vehicle is developed using the wireless sensor devices for detecting the theft of the vehicle .But this application does not track the vehicle if it is away from the parking lot and also for the Vehicle in motion. Vehicle Tracking systems uses a wide range of new technologies and communication networks including General Packet Radio Service (GPRS), Global System for Mobile Communication (GSM), the Internet or the World Wide Web and Global Positioning System (GPS)[4]. The following section discusses the framework for a bus tracking system using GPS and GSM technologies.

II. LITERATURE SURVEY

Participatory Sensing, user activity recognition and Urban Sensing provides a rich contextual information for applications of mobile such as location based services and social networking**.** Mobile devices consumes huge amount of energy by continuously capturing this contextual information. A new design framework for an Energy Efficient Mobile Sensing System (EEMSS) is proposed in this paper. To recognize user states as well as to detect state transitions EEMSS uses hierarchical sensor management strategy. EEMSS significantly improves device battery life by powering only a minimum set of sensors and using appropriate sensor duty cycles. A set of users' daily activities in real time using sensors on an off-the helf high-end smart phone can be mechanically documented by EEMSS. This approach

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increases the mobile battery life by more than 75% while maintaining both low potential and high accuracy in recognizing changes between end-user activities by design , implementation and estimate of EEMSS with 10 users over one week has been presented in this paper[3]. To provide location-based or context-aware services many evolving smart phone applications require position information. In spite of the GSM/Wi-Fi based positioning systems; GPS is frequently preferred over its alternatives as it is known to be more accurate. A positioning system that delivers accurate position information while spending minimal energy is the main requirement of such applications. This paper proposes a Rate-Adaptive Positioning System (RAPS) for smart phone applications. Generally GPS is less accurate in urban areas, so it is sufficient to turn on GPS only when it is necessary to achieve this accuracy. To smartly determine when to turn on GPS, RAPS uses a collection of techniques. It turns on GPS adaptively only if the estimated uncertainty in position exceeds the accuracy threshold based on the location-time history of the user to estimate user velocity. Using a duty-cycled accelerometer it efficiently estimates user movement and to reduce position uncertainty among adjacent devices it make use of Bluetooth communication. To avoid turning on GPS it employs cell tower-RSS blacklisting to detect GPS unavailability i.e., indoors. Using a prototype implementation on a modern smart phone .We evaluate RAPS through real-world experiments and prove that it can increase mobile battery lifetime by more than a factor of 3.8 where GPS is always on[4]. A critical task in many applications is Activity monitoring, often conducted using expensive video cameras. Evaluating images from multiple cameras in effectively monitoring a large field remains a challenging issue. In other way it is necessary to attach the special devices to track the object which is not possible in many scenarios. To resolve this issue, this paper proposes to use RF tag arrays for monitoring the activity where data mining plays a vital role. Due to the low cost of RF readers and tags the RFID technology provides an economically attractive solution. The tracking objects do not need to be prepared with any RF transmitters or receivers is another important feature of this design. The noise of RF tag data and mine frequent path patterns are offset to model the regular activities by designing a practical fault-tolerant method. The feasibility and the effectiveness of this design can be determined by observed study using real RFID systems and data sets [5]. Most of the developing context aware services and location based applications require the position information. These applications make use of more energy-hungry GPS instead of preferring the use cell tower-based localization because of its inaccuracy. This paper proposes a Cell-ID Aided Positioning System (CAPS). CAPS influence the position history of a user and near-continuous mobility to significantly achieve better accuracy than the cell tower-based approach by keeping the low energy overhead. Based on the insight that users show reliability in routes travelled, and that cell-ID transition points that the user experiences on a frequently travelled route, uniquely identify position CAPS is designed. To estimate current position based on the GPS position sequences that match the current cell-ID sequence and history of cell-ID CAPS uses a cell-ID sequence matching technique. CAPS have been employed on Android based smart phones and evaluates it at different platforms, and different transporters and locations which results in 90% of the energy spent by the positioning system compared to where GPS is always used and reasonably provides a accurate position information with less than 20% of errors than the cell tower-based scheme[6]. In order to use a Easy Tracker, a transit agency must obtain android- based smart phones, install an application and to place a phone in each transfer vehicle. The online algorithm in transit vehicle automatically determines the location server, infer schedules and locate stops at a given time and predict its arrival time in its upcoming stops. The main goal of this paper is to reduce the cost and difficulty in offering these services by developing an automatic system for mapping, transit tracking and arrival time prediction i.e. Easy Tracker. This system consists of four main components 1. Smartphone - installed in each bus or vehicle, which functions as a tracking device or an automatic vehicle location system. 2. Back-end server- which stores vehicle trajectories into schedules, route maps and prediction parameters, 3. Online processing - which uses the real-time location of a vehicle to predict arrival time. 4. User interface - allows a user to access current vehicle locations and predicted arrival time[7]

III. PROPOSED SYSTEM

A)BUS TRACKING SYSTEM

The GPS receiver of the vehicle terminal receives and resolves the navigation message broadcasted by GPS position satellites and computes the longitude and latitude of vehicle coordinates. This information is transmitted into the server using GSM network using SMS and the information is stored in the database of the server.

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The users can retrieve the data on registering themselves by sending the route number and the stop name where they need an alert. When the bus reaches the particular stop, the reply from the server is the location of the particular bus at that time. The overall architecture of the tracking system is given in figure:1

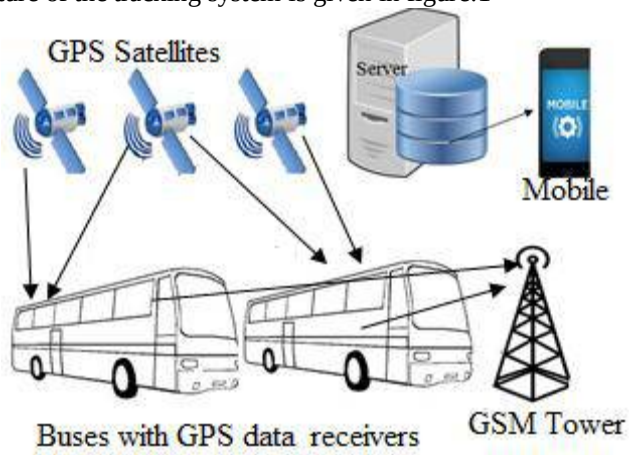

Figure-1 Overall Architecture of the tracking system

This system also has a ability for informing the change of route & eliminations to registered users and can resolve following problems such as late arrivals, unsuitable use of vehicles, unsafe driving practices etc. The tasks involved in the systems includes, tracking the vehicle, communicating between the tracker and server, locating the vehicle using GPS data and communicating between the user and the server .

B) RELATED TECHNOLOGY

The LinkIt ONE development platform is an open source, high performance board for prototyping Wearables and IoT devices. It is based on the world's leading SoC for Wearables, BMediaTek Aster (MT2502) combined with high performance Wi-Fi (MT5931) and GPS (MT3332) chipsets to provide you with access to all the features of MediaTek LinkIt. It also provides similar pin-out features to Arduino boards, making it easy to connect various sensors, peripherals, and Arduino shields. LinkIt One is an all-in-one prototyping board for IoT/wearables devices. Integrating GSM, GPRS, Wi-Fi, GPS, Bluetooth feature

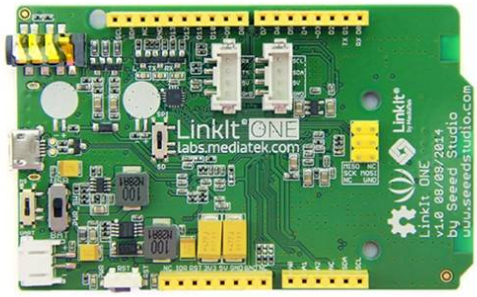

Figure-2 linkit one pinout board

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Includes ARM7 EJ-S™, GSM, GPRS, Wi-Fi, Bluetooth BR/EDR/BLE, GPS, Audio codec, and SD card connector on a single development board. λ Pin-out similar to Arduino boards, including Digital I/O, Analog I/O, PWM, I2C, SPI, UART and power supply, compatible with Arduino. λ Provides various interfaces for connecting to most sensors, peripherals, Groves, and other widgets. λ You are what you wear. Using LinkIt ONE together with MediaTek LinkIt SDK (for Arduino) you will be able to easily turn your ideas into practical prototypes and make them a reality with the Seed agile manufacturing and promote service.

C)SENSORS

1. VIBRATION SENSOR:

The vibration module based on the vibration sensor SW-420 and comparator LM393 to detect if there is any vibration that beyond the threshold. The threshold can be adjusted by the on-board potentiometer. When this no vibration, this module output logic LOW the signal indicate LED light, and vice versa. No shock, vibration switch was closed conduction state, output of low output, the green indicator light. Shock, vibration switch instantly disconnected, the output-side output high, the green light does not shine. The output can be directly connected to the microcontroller to detect high and low, thereby detecting whether the vibration environment, played the role of the police.

Figure-3 vibration sensor.

2. PUSH BUTTON

A Push button Switch is a Switch designed so that its contacts are opened and closed by depressing and releasing a push button on the switch in the direction of its axis .Push button Switches come in two categories :lighted and non lighted. The push button returns to its original position after it is released.

IV.BLOCK DIAGRAM AND IMPLEMENTATION

The Block diagram of MTC bus tracking system based on GSM and GPS technology is shown in the figure5. It consists the power supply section, GSM, GPS, vibration sensor, Linkit one pin out, IR Transmitter, IR receiver, LCD and button sensor. The GSM board has a valid SIM card . The circuits powered by +5v Dc. The system was implemented and tested. When the request SMS was sent the device responded by sending a response SMS to the user with the location details.

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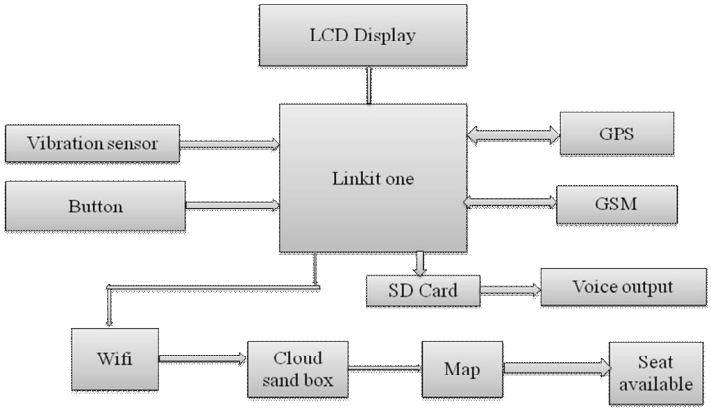

Figure-5 block diagram of MTC bus tracking system.

V. CONCLUSION

Thus our project is used to give real-time location of the bus. SMS service provides real-time bus arrival information for convenience of passengers. Bus passengers can schedule their journey accordingly. It also gives an information about seat availability of the bus to the user. And it gives intimates a message to the user when the bus met with an accident. It is very important for the people residing in cities to use the public means of transport. will be useful and more secure.

VI.FUTURE SCOPE

This work can be extended to include different maneuvers to make the driving system capable of dealing with all driving environments. Future issues may also include an algorithm for autonomous formation of the cooperative driving. Thus with the current and growing awareness of the importance of security, trustworthy, vehicle autonomous systems can be deployed in few years.

VII.ACKNOWLEDGEMENT

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REFERENCES

[1] Dr. Kamal Jain and Rahul Goel, GPS Based Low Cost Intelligent Vehicle Tracking System (IVTS), 2012 International Conference on Traffic and Transportation Engineering (ICTTE 2012) IPCSIT vol. 26 (2012) © (2012) IACSIT Press, Singapore.
[2] Baburao Kodavati, V.K.Raju, S.Srinivasa Rao, A.V.Prabu, T.Appa Rao, Dr.Y.V.Narayana, GSM and GPS based vehicle location and Tracking System, International Journal Research and Applications (IJERA) ISSN: 2248-9622 Vol. 1, Issue 3, pp.616- 625.
[3] Aravind, K. G.; Chakravarty, T.; Chandra, M.G.; Balamuralidhar, P., "On the architecture of vehicle tracking system using wireless sensor devices," Ultra Modern Telecommunications & Workshops, 2009. ICUMT '09. International Conference on , vol., no., pp.1,5, 12-14 Oct. 2009.
[4] Almomani, I.M.; Alkhalil, N.Y.; Ahmad, E.M.; Jodeh, R.M., "Ubiquitous GPS vehicle tracking and management system," Applied Electrical Engineering and Computing Technologies (AEECT), 2011 IEEE Jordan Conference on , vol., no., pp.1,6, 6-8 Dec. 2011.
[5] Kunal Maurya ,Mandeep Singh, Neelu Jain, "Real Time Vehicle Tracking System using GSM and GPS Technology-An Anti-theft Tracking System",International Journal of Electronics And Computer science Engineering,ISSN 2277-1956/VIN3-1103-1107.
[6] El-Medany,W.;Al-Omary,A.;Al-Hakim,R.;Al-Irhayim,S.;Nusaif,M.,"A Cost Effective Real-Time Tracking System Prototype Using Integrated GPS/GPRS Module," Wireless and Mobile Communications .
[7] Chen, H., Chiang, Y. Chang, F. H. Wang, Toward Real-Time Precise Point Positioning: Differential GPS Based on IGS Ultra Rapid Product, SICE Annual Conference, The Grand Hotel, Taipei, Taiwan August 18-21,(2010). .
[8] Asaad M. J. Al-Hindawi, Ibraheem Talib, "Experimentally Evaluation of GPS/ GSM Based System Design", Journal of Electronic Systems
Volume 2 Number 2 June 2012.
[9] Vikram Kulkarni & Viswaprakash Babu, "embedded smart car security system on face detection", special issue of IJCCT, ISSN(Online) : 22310371, ISSN(Print):0975-7449,volume-3, issue-1.