VEHICLE ACCIDENT DETECTION AND QR CODE BASED INFORMATION SYSTEM

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 Abstract : This project entails the development of a real-world Android application in which the user can easily coordinate and maintain all of the relevant facts about a car (such as the registration certificate, insurance, and vehicle's Pollution Under Control Certificate). Quick Response Code (QR-Code) is a very efficient and quick-to-read technique used to scan a variety of items. A vehicle's specifics A secondary application for a vehicle's inspecting authority is also produced to check the information. The vehicle's credentials the authority must scan a unique QR-Code (issued separately for each vehicle inspection) into the smartphone app is a good idea. The basic UI (User Interface) enables for faster identification of objects. The availability (or lack thereof) of key paperwork relevant to that particular car. These are the applications that aid in the saving of a substantial amount of time and resources now spent on this activity in light of the security threats posed by, In addition to exposing user's personal information, more attention has been paid to data security through the use of QR codes and access control to those particulars.

INTRODUCTION:

Microcontroller are widely used in Embedded Systems products. An Embedded product uses the microprocessor (or microcontroller) to do one task & one task only. A printer is an example of Embedded system since the processor inside it perform one task only namely getting the data and printing it. Although microcontroller is preferred choice for many Embedded systems, there are times that a microcontroller is inadequate for the task. For this reason, in recent years many manufactures of general-purpose microprocessors such as INTEL, Motorola, AMD & Cyrix have targeted their microprocessors for the high end of Embedded market. One of the most critical needs of the embedded system is to decrease power consumptions and space. This can be achieved by integrating more functions into the CPU chips. All the embedded processors have low power consumptions in additions to some forms of I/O, ROM all on a single chip. In higher performance Embedded system, the trend is

to integrate more & more function on the CPU chip & let the designer decide which feature he/she wants to use.

Physically, embedded systems range from portable devices such as digital watches and MP3 players, to large stationary installations like traffic lights, factory controllers, or the systems controlling nuclear power plants. Complexity varies from low, with a single microcontroller chip, to very high with multiple units, peripherals and networks mounted inside a large chassis or enclosure

In general, "embedded system" is not an exactly defined term, as many systems have some element of programmability. For example, Handheld computers share some elements with embedded systems such as the operating systems and microprocessors which power them but are not truly embedded systems, because they allow different applications to be loaded and peripherals to be connected. Embedded systems span all aspects of modern life and there are many examples of their use. Telecommunications systems employ numerous embedded systems from telephone switches for the network to mobile phones at the end-user. Computer networking uses dedicated routers and network bridges to route data.

Embedded systems are designed to do some specific tasks, rather than be a general-purpose computer for multiple tasks. Some also have real-time performance constraints that must be met, for reasons such as safety and usability; others may have low or no performance requirements, allowing the system hardware to be simplified to reduce costs.

Embedded systems are not always standalone devices. Many embedded systems consist of small, computerized parts within a larger device that serves a more general purpose. For example, the Gibson Robot Guitar features an embedded system for tuning the strings, but the overall purpose of the Robot Guitar is, of course, to play music. Similarly, an embedded system in an automobile provides a specific function as a subsystem of the car itself.

The software written for embedded systems is often called firmware, and is usually stored in read-only memory or Flash memory chips rather than a disk drive. It often runs with limited computer hardware resources: small or no keyboard, screen, and little memory.

A QR code is type of barcode that can contain more information than the familiar kind scanned at checkouts around the country. The "QR" stands for "quick response," a reference to the speed at which the more amounts of information they contain can be decrypted by scanners. They were invented in Japan and initially used for tracking shipping. As the code can be easily decrypted by the camera of smart phone, this technology is increasingly accessible to the average person. Instead of tracking car parts and packages, the codes can be used to store information of user. A QR code acts as a link embedded in the real world, integrating it with the virtual computer world. The development of a transportation system has been the generative power for human beings to have the higher civilization above creatures in the earth. Automobile has a great importance in our daily life. We use it to go to our work place, keep in touch with our friends and family, and deliver our goods. But it can also bring disaster to our people and even can kill us through accident. An accident is a deviation from expected behavior of event that adversely affects the property, living body or persons and the environment. Travelling is primary concern for everyone. Recent advances in Android are one of the most popular smart phone platforms at the moment, and the popularity is even rising. Additionally, it is one of the most open and flexible platforms providing software developers easy access to phone hardware and rich software API. Smartphone technologies are making it possible minimize the death rate which are happening by vehicle accidents in a more effective manner.

Existing system is totally manual and user needs to call police station and hospital individually. Then police station register FIR. Unless and until police station finish its process hospital can't proceed further. After finishing FIR process, hospital admits the injured person. There isn't any automation system for accident.
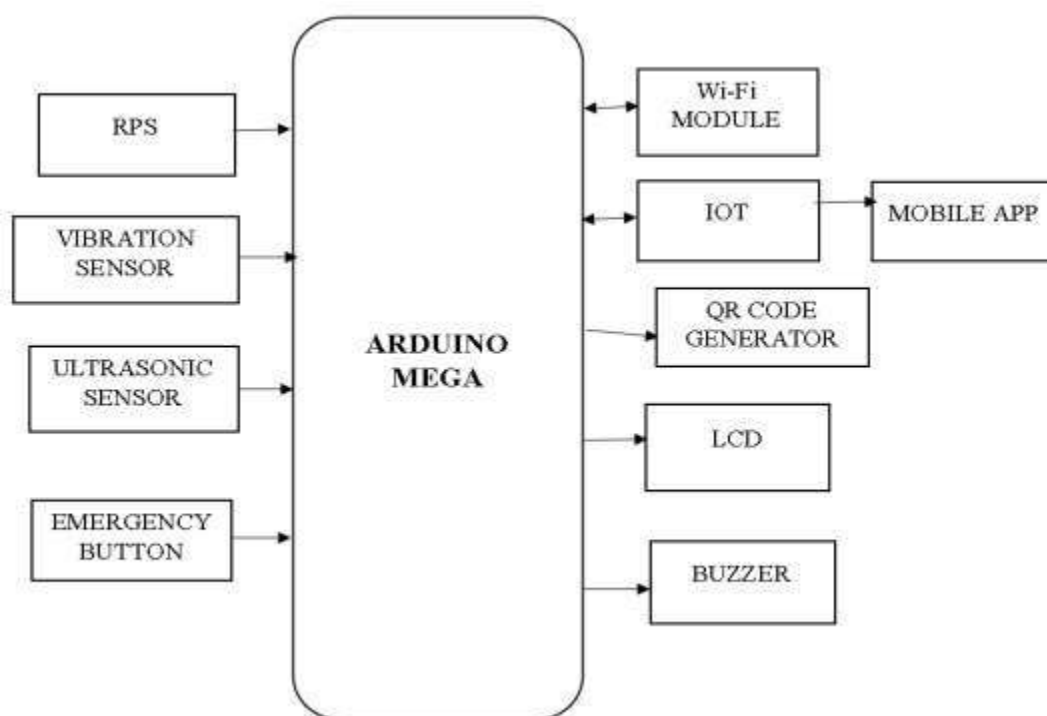
To improve human health and well-being is the ultimate goal of any economic, technological and social development. The rapid rising and aging of population are one of the macro powers that will transform the world dramatically, it has caused great pressure to food supply and healthcare systems all over the world, and the emerging technology breakthrough of the Internet-of-Things (IoT) is expected to offer promising solutions (National Information Council 2008). Therefore, the application of IoT technologies for the food supply chain (FSC) (so-called Food-IoT) and in-home healthcare (IHH) (so-called Health-IoT1) have been naturally highlighted in the strategic research roadmaps (European Commission Information Society 2009). To develop practically usable technologies and architectures of IoT for these two applications is the final target of this work. The phrase "Internet of Things" (IoT) was coined at the beginning of the 21st century by the MIT Auto-ID Center with special mention to Kevin Ashton (Ashton 2009) and David L. Brock (Brock 2001). As a complex cyber-physical system, the IoT

Integrates all kinds of sensing, identification, communication, networking, and informatics devices and systems, and seamlessly connects all the people and things upon interests, so that anybody, at any time and any place, through any device and media, can more efficiently access the information of any object and any service (ITU 2005, European Commission Information Society 2008 and 2009). "Ubiquitous" is the distinct feature of IoT

technologies, so the IoT is often related to ubiquitous identification (Sheng et al. 2010), ubiquitous sensing (ITU-T, 2008), ubiquitous computing (Fried Ewald and Raabe 2011), ubiquitous intelligence (Zheng et al. 2008), etc. As shown in Figure 1-1, a vivid description of this vision has been illustrated in a report by The Economist in 2007 (The Economist 2007).

A vivid description of the vision of Internet-of-Things (Authorized by Jon Berkeley) The impact caused by the IoT to human life will be as huge as the internet has caused in the past decades, so the IoT is recognized as "the next of internet". A part of the enabling technologies are sensors and actuators, Wireless Sensor Network (WSN), Intelligent and Interactive Packaging (I2Pack), real-time embedded system, Microelectromechanical Systems (MEMS), mobile internet access, cloud computing, Radio Frequency Identification (RFID), Machine-to-Machine (M2M) communication, human machine interaction (HMI), middleware, Service Oriented Architecture (SOA), Enterprise Information System (EIS), data mining, etc. With various descriptions from various viewpoints, the IoT has become the new paradigm of the evolution of information and communication technology (ICT).

ADVANTAGES AND ANALYSIS

A. Using wireless sensor network and cloud computing

This method is generally effective, but lack of system performance monitoring can be costly. One of the benefits of this method is its high speed due to the lack of human intervention.

B. Accident detection using the IoT capabilities

This method is overly reliant on humans, for example, if the user forgets to turn on their NFC, the system misses the user's ride and the entire system remains idle, increasing the likelihood of casualties and injuries. Also, if a person gets into a car that is not a member of the system, the system is completely unaware of their status. The advantage of this system is that aid agencies are directly connected to it and can respond quickly.

C. Accident detection using Vanet and IoT

In this method, the health of the occupants is of paramount importance and it is constantly sought to ensure their health. The disadvantage of this method is the expensive equipment used in this method.

D. Mobile application for accident detection

This method is very low-cost and requires only a mobile phone. It takes some time for the software to get used to the new environment and the user is constantly rejecting error accident messages

RESULT AND DESCUSSION

1) User: The person who met with the accident can access this application by simply pressing the button. Further he/she are provided with the details of nearby police station and hospital.
2) Police Station: After user pressing the button provided in the application then the GPS will be automatically made on and based on thecurrent location we will fetch the details of nearby police station and further user can choose the police station and register the complaint. Police station generate FIR and send copy to the hospital
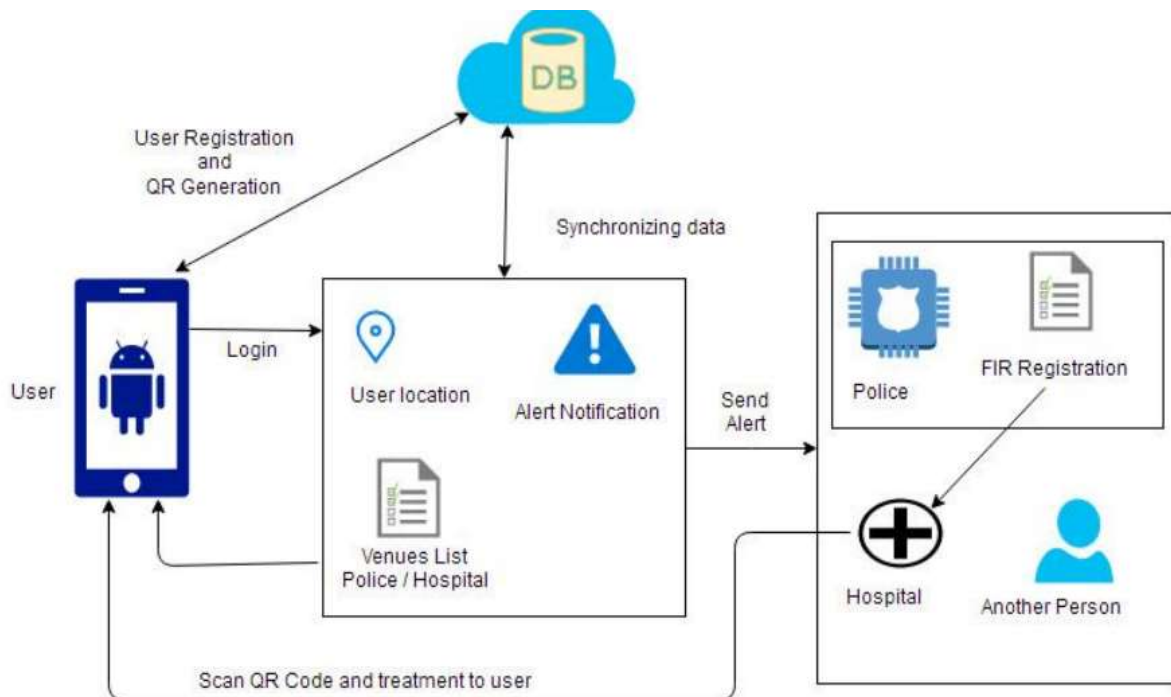

Fig.V.1 System Architecture

Notification Phase Implementation:

 After an accident is identified, the cloud determines the nearest hospital and informs the hospital about the accident. This is performed using a web-based application. The application has been developed using ASP .NET MVC 4. This interface is used by the hospital to establish whether there is an emergency or not. Whenever an accident occurs, the website receives the information regarding the accident. The website shows the details of the accident such as the location of the accident and driver land vehicle information. A Microsoft SQL database is used to store all the information regarding an accident. The website uses HTML, CSS and bootstrap for the development of the interfaces. The Google Maps API is used to

show the position of the accident on a map. Figure below shows the working of web based application.
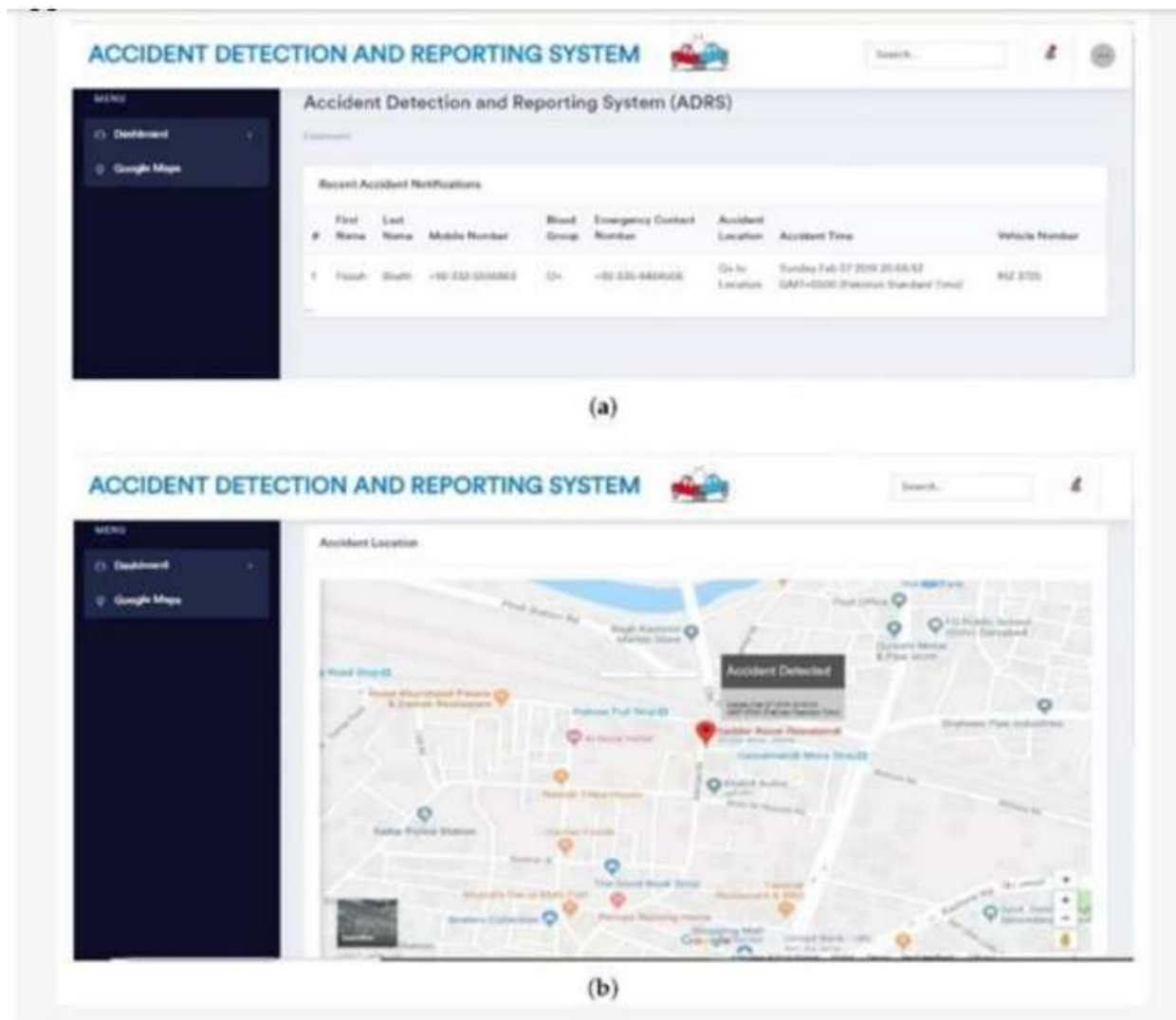

Fig 6 :(a) accident details; (b) location of the accident.

The overall result of this project is an application that provides help to people who require time of the accident with their location which helps emergency services provide support as early and effective as possible. All this is done with only the sensors available at low cost
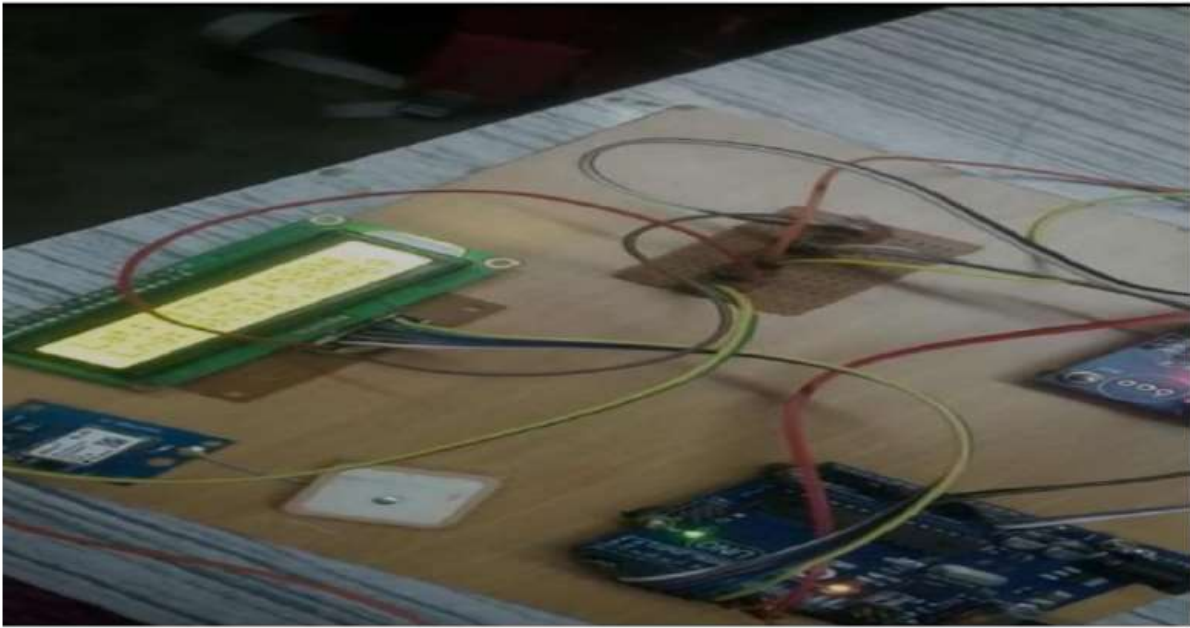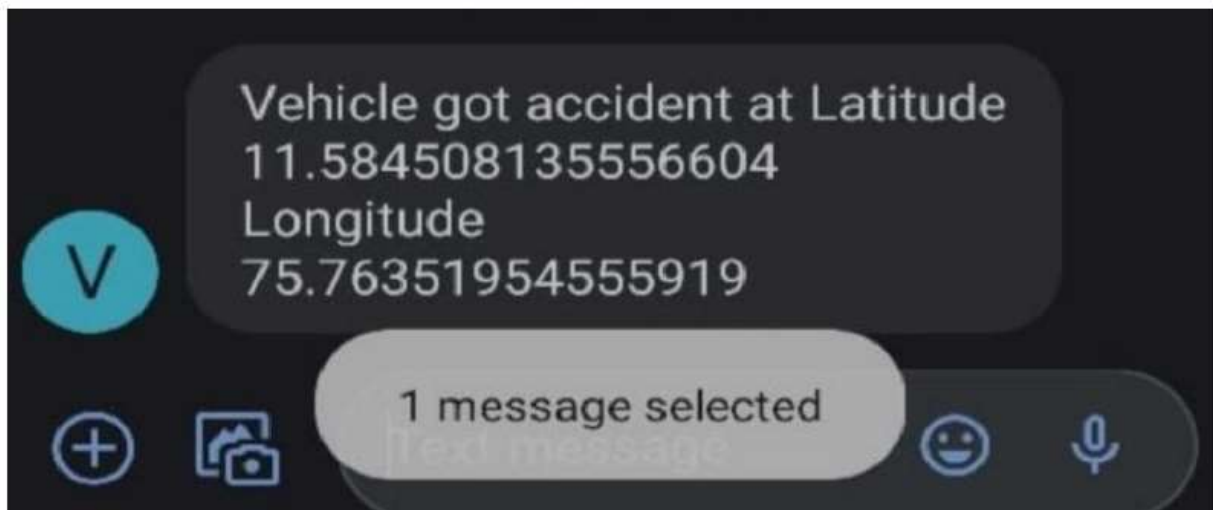
Fig 7.Interfacing controller with Lcd.

Fig 8.Notification message.

CONCLUSION

In this paper, new methods for car accident detection based on IoT are analyzed and their characteristics, advantages and disadvantages are compared. Smart accident detection systems must balance automation and autonomy against human monitoring and intervention so that the system, most of the time, can do its job properly and minimize casualties in the event of malfunctioning. Such a system should be able to compensate for human negligence. The best accident detection systems are those that require less hardware equipment and are

easier to implement. The hardware requirements of such systems are the biggest obstacle to their implementation and widespread use because they may not be economically viable. To implement this system, communication channels between private companies and aid organizations must be very powerful. If governments and private companies work together to implement this system, it can save many lives.

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