

Efirstaid Medical Services for Accident Cases

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ABSTRACT:

From a newspaper survey, it is badly noted that for every second, 5 people in India meet accidents and lose their life. The main course of loss of life in accidents is due to the unavailability of quick first aid medical service. To overcome this problem, Government and private aid centre run mobile ambulance service. Due to delayed communication between the accident spots and service departments, fast first aid and medical assistance for the people who suffer in accident spot have not provided in correct time. There is also another problem of intimating the accident if it occurs in remote areas. Though the medical service reached spot, it has to test the victim's blood group to give the appropriate blood suits his blood current. These are the barriers considered by us and find the solution through this work

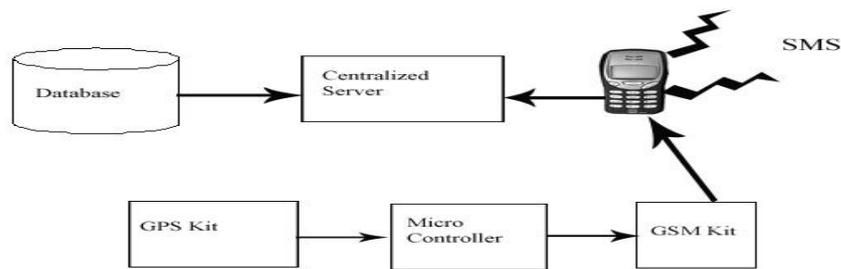
Keywords: AT, GSM, GPS, PHP, SQL, SMS

I. INTRODUCTION

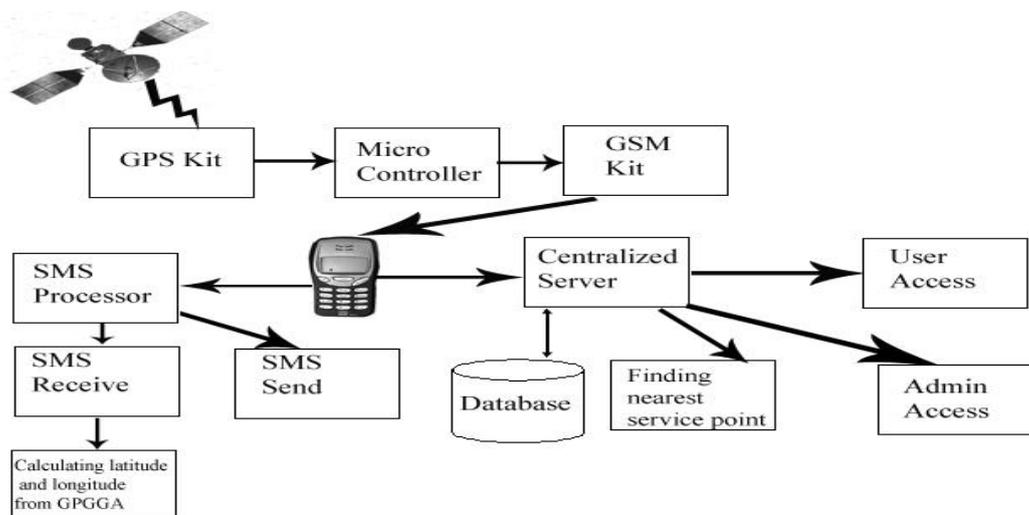
Web Technology, Mobile Technology and Embedded Technology are the most vital blocks of any fields in current situation. By making fusion of these technologies, tremendous benefits can be made for both scientific and commercial use. Database Management is an another unavoidable concept in every technology. Web Technology is the most wanted in recent trends to keep in touch with world in 24 X 7. To make optimized use of both embedded and mobile technology meet the crown when they are joined by the web. Internet is the most shortlisted necessity for all kinds of people and various fields of business and services. By maintaining database in the server side, this project can service our clients rely on their requests. Concerning with web technology, it should be both security and easy usage to the clients for efficient service. The website also has to consider the speed of loading and current trends. PHP addresses all these issues. In the Embedded unit, (i.e) The hardware unit which operates as by processor (software) defined by the programmer. Typically, an embedded system is resident on a microprocessor or microcontroller (eg. 89C52) board with the programs stored in memory (ROM). Virtually all appliances that have a digital interface - watches, microwaves, VCRs, cars utilize embedded systems. Some embedded systems include an operating system, but many are so specialized that the entire logic can be implemented as a single program. An effective predefined program is burnt inside the microcontroller that performs as instructed. By instructing, the microcontroller can interface third vendor device to embedded unit and also we can direct that device as by our logic. Eg. GSM modem, GPS receiver. In the Mobile Technology, the project uses the GSM Modem (i e) Global System for Mobile communication. It is the heart of mobile phone for message and voice communication. It can also be used also in an isolated form. The GSM modem can be interfaced to the controller kit for messaging and even for dialing communication. Another most hot topic discussed now a days is the G P S (Global Positioning System) . It also be used in an isolated form. There are number of satellites dedicated for tracking any portion of the earth. So there is a chance to figure out small sand particles by latitude and longitude position (Geo Coordinates). Making fusion of both working of GSM and GPS devices is another important module. The project (E Firstaid Medical Service for Accident Cases) makes use of all above technologies and techniques.

II. SYSTEM DESIGN

The block diagram gives the system model of our project. It tells the links between the nodes for transmission, reception and processing of the data. Nodes here mentioned are embedded kit, GSM, GPS, Server, Database and mobile phone. Interfacing between all these nodes is also major important part of system model , hence they act as protocols for the communication between the node.



III. SYSTEM DEVELOPMENT



The Embedded Module of this project consists of three main parts. They are as follows,

- GPS Kit
- GSM Kit
- Controller Kit

The embedded kit designed with these three core parts is fixed into the vehicle. This kit operates at a very low voltage of 12V so the power can be easily got from the vehicle's battery.

A. GPS KIT:

The GPS (Global Positioning System) kit consists of a receiver which receives messages from the satellites rounding over the earth. Using messages received from a minimum of four visible satellites, a GPS receiver is able to determine the times sent and then the satellite positions corresponding to these times sent. The x , y , and z components of position, and the time sent, are designated as $[x_i, y_i, z_i, t_i]$ where the subscript i is the satellite number and has the value 1, 2, 3, or 4. Knowing the indicated time the message was received tr , the GPS receiver can compute the transit time of the message as $(tr - t_i)$. Assuming the message travelled at the speed of light, c , the distance travelled, p_i can be computed as $(tr - t_i)c$. A satellite's position and distance from the receiver define a spherical surface, centred on the satellite. The position of the receiver is somewhere on this surface. Thus with four satellites, the indicated position of the GPS receiver is at or near the intersection of the surfaces of four spheres. The GPS kit will return back the position in the GPGGA sentence.

B.GSM KIT:

The GSM kit is used in our project for sending of sms. The GSM Kit works in two mode. They are Text Mode and PDU Mode. The AT commands are used to control the operation of the kit. The kit will function at the baud rate of 9600. The command AT+CMGF=1 is used to set the sms format in Text Mode. The command AT+CMGS is to send the sms to the desired number.

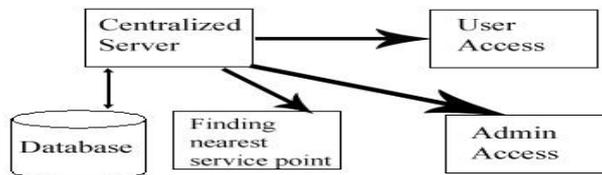
E.g AT+CMGS="9500252559" will send the sms to the mobile number 9500252559.

C.CONTROLLER KIT:

The 89C52 microcontroller is used in the project for controlling the GSM kit and GPS Kit. The Controller kit periodically receives the GPS signals and sends it to the centralised server using the GSM Modem via SMS. The kit was programmed using Embedded C to perform this operation. It was programmed such that it addresses the issue in difference in baud rate between the GPS kit and the GSM modem. If any accident occurs the kit sends the special SMS with the current position. That special SMS was prefixed with ACC to differentiate that from other ordinary SMS.

D.WEB MODULE

The Web Module of the project involves the creation of a centralized server and the creation of Global database. The database consists the details of the user information and the details of the service points.



E.CENTRALIZED SERVER

It is designed using web development language PHP. It is accessed by user as well as administrator. It provides 24X7 services to the society and it keep track the user by monitoring the database updates.

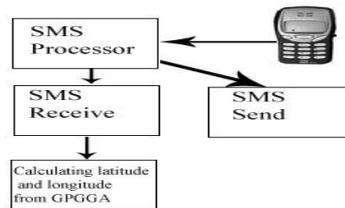
USER

User can perform the following operations

- New registration
- Edit profile
- Change password
- Drop profile

F.PC-MOBILE MODULE

This module is programmed using Visual Basic 6. In this module the interaction between the Mobile and the PC takes place. The database is the same database used by the Web Module.



The SMS sent from the GSM Modem fixed in the moving vehicle is received by the mobile connected to the PC. All the SMS received by the mobile is stored in the table SMSBASE. If the SMS received is the special SMS (i.e if it contained ACC) then it is stored in the SMSACC table. The smsbase table consists the timestamp, therefore it can be also used as the SMSlog.

E.GEO COORDINATES CONVERSION

The SMS received by the mobile is only in the GPGGA format. So, before storing that SMS into the database it has to be converted into latitude & longitude. To calculate latitude from the GPGGA sentence the second value from it is taken, the first 2 letters are added with the remaining divided by 60. e.g: $4924.6633 = 49 + (24.6633/60)$. To calculate longitude from the GPGGA sentence the fourth value is taken, the first 3 letters are added with the remaining divided by 60. E.g: $08151.6453 = 081 + (51.6453/60)$

F. SMS SEND

The SMS POLL table consists of the SMS text and the SMS number and a flag to denote the sending of SMS. If the flag is not set means, then the SMS is sent to the number which is available in the SMS POLL table. For sending of SMS a list box is maintained. The List box is treated as the queue. The SMS is sent to the numbers present in the list one by one. After the SMS is sent the flag available in the SMS POLL table is set to TRUE, indicating that the SMS has sent.

IV. CONCLUSION

In the older system, only manual help for both processing information and intimating the event. And also there is no system database for all the people using the roadways for usage in case of accident. There is no system for intimating the location of accident to the service point without the third party concern. But our application of combining embedded, web and mobile technologies extract the optimized solution for all barriers mentioned above. This is the complete system of information technology for the commercial use. This application acts as a life guard for them. Making the optimized use of GOLDEN HOUR, intimating the accident with location details to the centralized server, by processing the message with user id, server intimates the appropriate nearby service point and police station and also to the well-wisher of the user. Service point reaches the spot with required blood group based on data in server. User can upload their information independently in the user-friendly website. In future this project can be enhanced in the following ways. There is enhancement in strong detection of accident, by using core electronics sensor application. There is also an area of opportunity to enhance this project to send severity of accident by sensing the damage of the vehicle. It helps the service point to act upon that information for servicing the victim.

REFERENCES

- [1.] Mandellos, G.J. Lympopoulos, D.K. Koukias, M.N. Tzes, A. Lazarou, N. Vagianos, C. "A novel mobile telemedicine system for ambulance transport. Design and evaluation" IEEE paper in Engineering in medicine and Biology Society, 2004 pages 3080-3083
- [2.] Tsuyoshi Okada, Takumi Ajima, "Emergency Assistance System for Automobile Accidents"- Google patent search
- [3.] Coats, T.J; Davies, G. "Prehospital care for road traffic casualties". BMJ. 2002;324:1135-1138. .
- [4.] K.Mohanraj, S.Prabakaran, R.Ananth, M.Jeyapriya, "Application of GIS in Accident Management System".
- [5.] Stroh, G; Braude, D. Can an out-of-hospital cervical spine clearance protocol identify all patients with injuries? An argument for selective immobilization. *Ann Emerg Med.* 2001;37:609-615.
- [6.] Christopher cosentino, "Advanced PHP for Web Professionals"
- [7.] Danny Goodman, "Javascript Bible"
- [8.] David Powers, "PHP Solutions: Dynamic web design made easy"