

Iot – Based Information System for Emergency Medical Services

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Abstract- Internet of Things is an upcoming technology which uses the present infrastructure along with its technology to provide information ubiquitously. In this paper we are proposing a solution to provide medical services during emergency conditions. RFID technology processes better output within this domain. Emergency medical services provides out-hospital medical care. DSS methodology is used to make a decision at the time of emergency. The basic idea is to keep the hospital pre-informed about the patients that might report them during such situations. The work of hospital mainly is to provide information of its availability along with its required medical services. This will help us in saving precious time during the be immense due to the technology used as more and more lives can be saved.

Index Terms – DSS (Decision Support System), RFID (Radio Frequency Identification), Search Process and Selection Process.

I. INTRODUCTION

Internet of Things is an approach which connects different modules with internet as a medium to share data with less time and space complexity. IoT acts as an enhancement in the present technology which will help us in the near future. Progress in the field of Internet Of Things has displayed the potential of IoT.

IoT has provided us different methods to access the data. The data can only be accessed online (connected to the internet).

DSS or Decision Support System is a information system used to make decisions in various business organizations. DSS systems are of two types Unstructured and semi-structured decision pattern. DSS requires a structured approach. DSS framework includes people, technology and development approach. The DSS approach is majorly used in business management in order to represent charts and graphs in a better and summarized manner. This approach helps in making strategic decisions in a faster manner. For medical analysis we use clinical Decision Support System (CDSS). CDSS has four stages. The first stage is the primitive version. Second is the integration with other

medical services. Third stage is standard based stage. The final stage is called the service based model.

Cloud Technology is also used for storage of data which maybe in various forms viz. structured, unstructured, semi-structured. For accessing as well as exchange of data. Sensors will be remotely installed inside the van which will be carrying the patient under observation.

The sensors will calculate the vital stats of the patient under observation and will send it to the hospital which will be selected by the nurse present inside the ambulance van.

The main motive behind this technology is to provide fast and reliable service. In this way we harness all the functionalities of the above mentioned technologies to the best and generate the desired result. The nurse which will be present inside the van needs to consult about the various hospitals in the vicinity so as to provide the best solution to the patient.

Through this project we are embedding medical services along with advanced technology in making the life of a patient better.

II. LITERATURE SURVEY

Data Accessing methods can be of various types such as

1. Ubiquitous data accessing
2. Mobile DSS(Decision Support System)
3. Emergency DSS[1] (Decision Support System).

Wu.at.el[2]Ubiquitous Data Accessing implies general methods of exchanging data at the time of emergency. The exchange of data is so quick that it helps in saving the time as well as human life. It is used to access heterogeneous data format by building a real time website the data usually stored is in the form of big data which is also an upcoming technology. Considering as reference this technique was implemented in a village in Shanghai. In which at the time of emergency events the police needs to be informed priori about the event and then the police officials call up the ambulance and then the further required operations are performed by the security officials as well as the nurse present in the ambulance.

Mobile DSS(Decision Support System). A Decision Support System is nothing but a system which accepts data and returns it in an understandable and better format than what has been given as input. Mobile Decision Support System basically operates on fuzzy relations in which the output is not deterministic its stays between two results either positive or negative. Mobile DSS technology is user centered. Here the user is given the preference over the choices and the final decision is made by the user. The basic functionality of mobile DSS is suitable only to the devices connected to the internet. And we are using the Mobile DSS as almost everyone around the globe are using mobile phones and are connected to the internet. It gives he power to the user than the required authority. The Mobile DSS systems are beneficial when complex decisions have to be made under time pressure and the environment is dynamic. Smart phones, PDAs and Tablets are widely used in Mobile DSS.

Emergency DSS is a Decision Support System is a support system used to improve the level of emergency management. The emergency DSS should be able to integrate all the data which is required for the further processing and working. As the main aim of our project is to decrease the elapsed time to respond to an emergency, this can be made possible by integrating it in a Decision Support System by the help of Emergency DSS. Emergency DSS is used to assist decision makers

,here the nurse sitting inside the ambulance, to select the appropriate decision. It begins when the emergency condition has been detected and till the moment it has been completely stabilized. The main aim of an Emergency DSS is to save lives during emergency situations like earthquakes, flood, terrorist attacks and during other natural and man-made calamities. It can said to be a tool which enhances the emergency response capabilities of the authorities.

Background and Contributions

Shancang Li, Lida Xu, Xinheng Wang & Jue Wangs[3] work focused on integrating hybrid wireless networks in cloud service oriented enterprise information systems. The article basically tells us about hybrid wireless network and integration scheme in cloud based upon enterprise info systems as cloud is upcoming technology this technique looks forward to seamless integration of new technologies with these info systems, the key features being various access control functionalities which come under the framework of the present cloud services[5].

Nearchos Paspallis and George Angelos [4] work aims at propagation of mobile devices and Ubiquitous computing according to the dynamic adaptation of software as this is the upcoming field in the field of science and technology. The focus is on providing these dynamic software modifications on the existing infrastructure and to increase the functionality of the software at present. Firstly the devices are deployed in a constrained environment and then processed with the help of this dynamic software. As it contains all the key features to harness technology of the present infrastructure.

III. PROPOSED SYSTEM

The main task in our system is to collect the data from the various sensors. The data maybe in heterogeneous format through the sensors. The collected data is then transferred to the smart device be it a Tablet or a Smartphone, from which the collected details along with the patient data will be sent to the concerned hospital. The main motive behind this is to keep the hospital pre informed so that they can be prepare themselves for operating the causality.

There are going to be mainly three types of sensors viz. one to calculate the heartbeat, another to check the blood pressure and the third one to check the current body temperature of the patient. These three aspects are the vital stats of the patient which are required to be noted down before providing any kind of medical service. And along with this the nurse concerned will put in the basic symptoms of the patient. The decision of selecting the hospital depending on its availability will be with the user (nurse/doctor) present with the patient. Here, availability of a hospital depends upon various parameters such as the availability of apparatus, medical service, doctors, etc. The selection process will be based on availability of hospital according to the available apparatus. After the hospital has been selected the details will be sent to the hospital reception, who would be forwarding this details to the concerned doctors and will arrange for an operation theatre immediately. The data which will be stored in the data base can be used for further analysis and can also be provided as a history backup to the patient for future reference. The aggregated data will help us analyze the pattern of the particular disease in that locality along with its occurrence. This will also help us in mapping the particular area according to the occurrence of the disease.

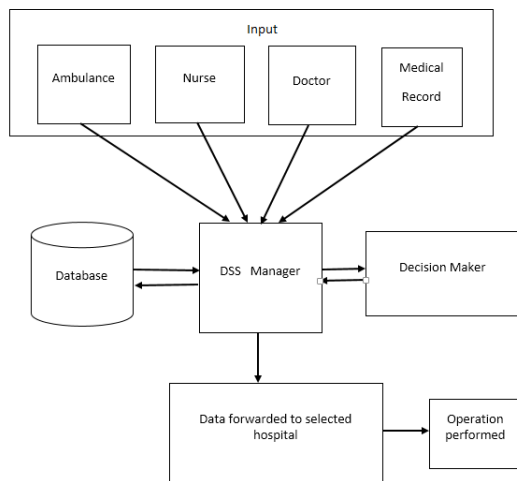


Fig: proposed architecture.

IV. CONCLUSION

Here we are trying to develop a system which may help in reducing the time consumed in providing medical help to the patients or casualties during emergency conditions or critical situations. And will also be providing better medical care as we are using ubiquitous

and fast access to data which may help in saving patients life as compared to previously used methods. Interoperable system plays important role towards the functionality of the system and is the most important aspect for its working. Communication is the key feature[6].

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