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A Comparative Study on the various Health Care Technologies and Solutions

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Abstract:

In this work, a comparative study on different healthcare technological solutions has been done. The worlds have started to explore various technological solutions to enhance healthcare provision in a manner that complements existing services by mobilizing the potential of the IOT. This paper surveys advances in IOT-based health care technologies. Thus from this study a new and improvised method will be proposed and the results will be compared based on different aspects.

Keywords — **Internet of Things(IOT), Drones, GSM module, health care, services, sensors.**

1. INTRODUCTION

The network consisting of physical devices, vehicles, home appliances and other items embedded with electronics, software, sensors, actuators and network connectivity which enables these objects to connect and exchange data is called as Internet of Things (IoT).The word "Internet of Things" was first described by Kevin Ashton. In 1999 the concept of IoT became popular, through the Auto-ID Center at MIT. The IoT allows object sensing or controlling remotely across existing network infrastructure thereby creating opportunities for more direct integration of the physical world into computer-based systems which results in improved effiency and accuracy. Internet of Things has wide range of applications.

GSM is a Global System for Mobile Communications developed by the European Telecommunications Standards Institute (ETSI). It's a cellular network where the mobiles connect to it by searching for cells in the immediate vicinity. Macro, Micro, Pico, Femto and umbrella are the five different cell sizes in a GSM network. This operates in a number of different

Carrier frequency ranges with most of the 2G GSM networks operating in 900MHz or 1900MHz. The key feature of GSM is the Subsciber Identity Module (SIM). It's a detachable smart card containing the user's subscription details and phonebook. For security, GSM uses several cryptographic algorithms. It uses General Packet Radio Service for data transmissions like browsing the web.

The drone was introduced by Reginald Denny and it was used first in World War 1. It is defined an Unmanned aerial vehicle, commonly known as a drone. The drones can be accessed by remote control system or by using software-controlled system. They are used in many applications namely surveillance, traffic monitoring, weather monitoring, photography, video graph, agriculture and delivery services etc. The Emergency system is for medical services also known as ambulance services. It is the patient support system and it is out of hospital medical care. Sometimes people experience sudden health conditions in forest areas, mountainous areas, rural areas where

they could not reach hospital on time which leads to serious conditions where a person may lose his life. In such cases the emergency medical system will be very useful.

II.LITERATURE SURVEY ON DIFFERENT APPLICATIONS

A. Ambubot based victim location identification for cardiac arrest

HoomanSamani and Rongbo Zhu designed and developed the ambulance robot, which brings along an AED in a sudden event of cardiac arrest and facilitates various modes of operation from manual to autonomous functioning to save someone's lives in smart cities. Ambubot was intented to improve on manual search assistance of finding AED with the help of the information technology so that an immediate treatment can be delivered to assist victims in cardiac arrest. Dispatching of ambubot to reach location of victims can basically get executed by three different modes, which are tele-control, partially autonomous and fully autonomous. The hardware of the ambubot is not that flexible.

B. CFD Simulations based tracking of lifting surfaces

Radu-Calin Pahonie et al proposed the solution of flexible wings that passively adapt to the flow. The pressure distribution and the corresponding shape change of the lifting surfaces are tracked, to further advance the knowledge on the aerodynamic characteristics of flexible wings. CFD simulations were used underline the aerodynamic characteristics of a custom designed small aircraft wing. The results obtained were validated by applying the Neilsen method and flow visualization gave the opportunity to account for the low influence of the separation bubble on the flow over the flexible airfoil, unlike the rigid one which was used to improve the overall design of the wing.

C. Smart luminaries and drones for smart guiding system for buildings

Hanoosh Amel et al proposed a system which is an extension of the work from i-Light project towards a smart guiding system for buildings. It's a system based on the use of smart luminaries and drones. Medical care units were one of the main targets of such system. Give audio indications to the potential users (patients, visitors, etc), carrying relevant supplies to the desired location etc were the use case scenarios included. The components of the system localization techniques applied within a building were discussed.

D. Evaluation of in-vehicle Decision Support System (DSS) for emergency evacuation

Sergei V. Ivanov proposed a simulation methodology for the evaluation of in-vehicle Decision Support System (DSS) for emergency evacuation which is based on transport system and human decision-making modelling. Based on the simulation it was shown that the use of in-vehicle DSS greatly reduces total time of evacuation. The overall effectiveness of the proposed method depends on the fraction of DSS users in a total evacuee number. The best time of evacuation achieved by this method was at 80%-85%(12.5-50 thousands of agent) of DSS users which was approximately two times faster than without the use of DSS at all. The proposed method has a flexible architecture for the implementation of new features and can be adjusted to any region easily. In future, accuracy can be improved for more effective evacuation by taking into account the behaviour characteristics in critical situations and the study of geographical structures.

E. Autonomous emergency support system (ESS) for evacuation of civilians in a built environment

Gokce Gorbil and Erol Gelembe considered the application of cheap pocket devices which are IEEE 802.15.4-2006 compliant to emergency situations when other means of communication have broken down. An autonomous emergency support system (ESS) based on oppcomms was described to support evacuation of civilians in a built environment such as a building or supermarket. The proposed system used a fixed infrastructure of sensor nodes (SNs) to monitor the environment. Hazard information obtained via SNs was disseminated to the individuals and was spread among the people who are located in this built environment using oppcomm devices. In this method all the communication nodes (CNs) were considered that they operate correctly. In future the security issues which arose when there was a malicious user in the system can be improved.

F. Emergency decision-making support for dynamic evolution of emergencies

Liu Cheng et al. (2017) developed a model for emergency decision-making support. It included two components namely formal description of object and formal description of emergency status related to the object. Advantages of this model were flexibility in describing dynamic evolution of emergencies, helping in define certain scenario and clarify its boundary, universal representation which contributes to similarity assessment. Similarity assessment based on the scenario representation model developed here can be focused more in the future.

G. IOT-based health monitoring system for emergency medical services

Punit Gupta et al. presented the design and implementation of an IOT-based health monitoring system for emergency medical services, which can demonstrate collection, integration and interoperation of IOT data flexibility, which can provide support to emergency medical services like Intensive Care Units (ICU), using an INTEL GALILEO 2nd generation development board. This proposed model enabled users to improve health related risks and reduce the headache of patient to visit to doctor every time he need to check his blood pressure, heart beat rate etc. The main goal of this proposed method was to give proper and efficient medical services to patients by connecting and collecting data information through health status monitors which would include patient's heart rate, blood pressure and ECG and sends an emergency alert to patient's doctor with his current status and full medical information.

III.CONCLUSION

In this paper, I have discussed various healthcares technological solutions presented by researchers have been presented in this paper. This paper surveys on IOT based healthcare technologies and This paper aimed to the existence of ambulance drone support system for emergency time in the natural environment.

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