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# U-HEALTHCARE and IoT

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**Abstract -** *Internet of things (IoT) is a fast growing, a user-friendly technology which allows everything to be connected and also allows effective communication between the connected "things." The Internet of Things, likewise called The Internet of Objects, alludes to a remote system between items, as a rule, the system will be remote and self-designing, for example, family unit machines. The term "Internet of Things" has come to describe some technologies and research disciplines that enable the internet to reach out into the real world of physical objects. IoT has top five applications, they are: Traffic monitoring, Healthcare, Security, Transport and Logistics, and Daily life. In this paper, we are going to discuss Health Care applications. The IoT could be a game-changer for the healthcare industry. It is transforming healthcare industry by increasing efficiency, lowering costs and put the focus back on better patient care. IoT in Healthcare is a heterogeneous computing, wirelessly communicating system of apps and devices that connects patients and health providers to diagnose, monitor, track and store vital statistics and medical information. This paper describes U-Health Monitoring (UHM). In this paper we have also discuss various methods adopted for healthcare issues in the IoT by a number of researchers. The majority of the survey is mainly focused on the different healthcare techniques used in the IoT, such as, Wireless health monitoring, U-healthcare, E-healthcare, Age-friendly healthcare systems .This paper describes the entire monitoring life cycle and highlights essential service components. It serves as a fundamental basis for achieving robust, efficient, and secure health monitoring. The main primary aim of this paper is to discuss health related issues and some techniques, such as, iMedBox, RFID Model, iMedPack.*

**Keywords:** *iMedBox, iMedPack ,RFID Model ,U-Health.*

## I. INTRODUCTION

Internet of Things (IoT) is a revolutionary prototype to combine various technologies and communication systems. IoT aims to provide means to access and control all kinds of ubiquitous and uniquely identifiable devices, facilities and assets. The IoT plays an important role in healthcare applications, from managing chronic diseases at one end of the spectrum to preventing disease at the other. Iot devices can be used to enable remote health monitoring and emergency notification systems .There is an increasing interest in Internet of Things due to population explosion and an increase in number of patients with illness are expected to boost IoT-based health care services. Google, Samsung and Apple are all currently making attempts to use their own mobile platform to build IoT platforms. As information sciences and technologies are complimented with various developments, such as sensor, nanotechnology, bio

technology. These developments have given us a new dimension of every industry. Iot is slowly making a move into the healthcare industry. There is database and protocol system used in some hospitals. E-healthcare system is moving into U-healthcare system by a fusion of sensors and mixed networks. These changes provide new requirement give a new opportunity to generate new market and industry. Pervasive computing (also called ubiquitous computing) is the growing trend towards embedding microprocessors in everyday objects so they can communicate information. The words pervasive and ubiquitous mean "existing everywhere." Pervasive computing devices are completely connected and constantly available. Ubiquitous technologies which are collaborated with sensors can be used in healthcare information. Currently, there is a shift in the trend of healthcare system which has moved to U-healthcare system with wireless characteristics. Many new technologies can be utilized to wireless sensor nodes with smart equipment and devices with low computing power.

## II. UBIQUITOUS - HEALTHCARE AND IoT

Ubiquitous healthcare (U-healthcare ) is a technology that promises increases in efficiency, accuracy and availability of medical treatment. U-healthcare system is to provide convenient healthcare service to both caregivers and patients, and to make it easy to diagnose patient's health condition. People can monitor their health without visiting the hospital or clinic. Pervasive computing has made the interaction between humans and computational devices completely natural and user can get the desired data in transparent manner. The newly introduced devices like mobile phone, laptops and Personal Digital Assistants have made ubiquitous computing possible. They are available anywhere at any time. Pervasive computing is used in hospitals, emergency and critical situations, industry, education or the hostile battlefield. The system architecture is mainly divided into : Body Area Network (BAN),Wearable Body Sensor Network (WBSN), Personal Monitoring Devices(PMD), Intelligent Medical Server(IMS), Hospital System (HS) . IoT offers promising opportunities to U-healthcare area. The idea is applied to U-healthcare to improve access and interconnection of devices used in U-healthcare. Imagine a wrist or arm band that senses vital signs , such as ,pulse, blood pressure, red blood cell counts, and glucose and cholesterol levels can even monitor activity levels. If walking is a prescribed benefit, the user might be reminded to do so. If medications should be taken at intervals, the user might be informed .

## III. EXISTING TECHNIQUES IN IoT

Niranjana [1] proposed an intelligent home-based healthcare IoT system , igiteway health-IoT system which consist of an Medical Box(iMedBox) which serves as a home healthcare gateway. IoT devices e.g., wearable sensors and intelligent medicine packaging (iMedPack)] are seamlessly connected to the iMedBox via a heterogeneous network, which is compatible with multiple existing wireless standards. The body-worn Bio-Patch can detect and transmit Theuser's bio-signals to the iMedBox in real time. The iMedPack is connected with the iMedBox via an RFID link to assist the users with their prescribed medication.

Kiholee [2] presented U-healthcare system in the internet of things environment(IoT) with the support of mobile gateway.Mobile healthcare applications include applications related to health/medicine, social network and human-to-human services. These mobile applications may be applied to all aspects of our lives. It provides the sensed information to a home medical station or doctor.

Yvette E Galogo [3-4] proposed an application for U-healthcare convergence which aims to make mobile devices gateway an integrated gateway which supports heterogeneous devices for U-healthcare. Devices may be embedded inside the body, implants, may be surface-mounted on the body in a fixed position. The body sensor senses the data and transmits to the mobile phone. Mobile phone is capable of processing the data received through multi-purpose gateways and compute the received information .The mobile phone will transmit the data to be analyzed in monitoring center. The mobile phone will compute the received sensing information and generate keywords and transmit to the monitoring system.

Jung Tae Kim [5] proposed an integrated framework to build a RFID card system by embedding smart tags in insurance cards, medical charts, and medical bracelets to store medical information. Their scheme gives and simplifies the maintenance and transfer of patient data in a secure, feasible and cost effective environment. As an initial model of U-healthcare system, m-health system is designed as an enhancement of e-health system supported by wireless Electronic Medical Record access(EMR). The rapid developments in technology and semiconductor process made their cost to reduce sharply and new technologies to emerge. As a result of reduced cost of RFID component, hardware became cheaper with more storage capacity and enhanced processing power. It gives a standard algorithm to be implemented in real world. These developments made it possible for technology to be more adopted among different industries.

Byung Mun Lee *et.al.*,[6] proposed a health IoT based mobile application. The system architecture has three layers that are hardware layer, middleware layer, application layer. For a user to provide his medical data to a medical service, they must first register a given medical device in the platform. The registration process can be divided into two stages: device registration in the initial stage and user registration to the device in the later stage. The Author has also discussed about registration protocol for health IoT platforms , in order to monitor the health information. The U-health services have been used in the sensor network , such as ,Bluetooth or Zigbee . The IoT network model for U-health is different from the sensor network in that all device and/or server have an independent function to send and receive information autonomously, while all information from the sensor is sent to the Healthcare server in the network model for U-Health.

#### **IV. CONCLUSION**

The gateway serves as a bridge for medical sensors and home/hospital building automation appliances to IP based networks and cloud computing platform. The simulation results proves that our proposed Intelligent e-health gateway iMedbox method improves the reliability and energy efficiency of the network compared to existing system. The proposed mobile gateway interface to support the mobile devices to be a device to receive sensing information from the sensor devices aims to make mobile device gateway an integrated gateway which supports heterogeneous devices. In the propose U-healthcare system, the received sensing information will be analyze using smartphone devices which will generate keywords. The keywords will then be sent to the medical expert system for analysis .U-healthcare application aims to make mobile device gateway an integrated gateway which supports heterogeneous devices for U-healthcare convergence. The health information system based on the wireless network infrastructure is generally adapted nowadays. As a part of the wireless network, a mobile device and agent has been employed in hospitals environmental. Especially, RFID system is widely used to identify objects, sensor module and IoT (Internet on Things) services. Two protocols were proposed: a protocol used to register a medical device in the platform and a protocol used to register a user-member in the registered medical device. These protocols allow mobile device users to easily connect with one another to facilitate easy and convenient registration.

#### **V. FUTURE WORK**

The U-healthcare system was provided to acknowledge the interoperability of devices of mobile gateway system. The detailed design of this framework and other device requirements are the future works of this study. The iMedbox gives a home healthcare station by providing strong interoperability and IoT network connectivity. The future work of this study regarding iMedBox includes security and authentication for IoT related healthcare using intelligent e-health gateways.

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