A Certain Investigation on Health Monitoring System by using Internetof Things [IOT]

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***Abstract*-In home healthcare services based on the internet of things have great business potential.Thispaper mainly depends on bio-medical sensor bio-medical sensor(such as temperature sensor, heartbeat sensor,glucose sensor etc,.) is proposed. It is used to sense the patient health. After checking the patient health it will prescribed what the medicine should be taken by the patients. Here we are using Imed Box Imed pack. In Imed box weight sensor is used to sense whether the patient is taken or not. In Imed pack using CDMA the shield of the pack is opened means the tablet is taken by patient. Here we are using Internet of things (IOT) to transfer the all information from patient to doctor. When the patient fails to take medicine at time SMS alert will be sent automatically to remain him/her to take medicine. when the critical situation arise for patient during unmonitored condition emergency alert will be send to doctor (or) remote physician. Here using voice play board used to voice transmission through speaker gives about patients heath condition.**

Index Terms—Internet-of-Things, HealthIoT, bio medical sensor, Medicine Box, voice play board-speaker.

1.INTRODUCTION:

Nowadays, global ageing and the prevalence of chronic diseases have become a common concern. Many countries are undergoing hospital restructuring by reducin(Hospital-Centric) to the home environment (Home-Centric). By doing so, firstly, the patients can get seamless healthcare at anytime in a comfortable home environment; secondly, society's financial burden could be greatly reduced. The number of hospital beds and increasing the proportion of homehealthcare. A promising trend in healthcare is to move routine medical checks and other healthcare services from hospital treatment.thirdly, limited hospital resources can be released for people in need of emergency care. In-home healthcare and services can drastically reduce the total expenditure on medical care or treatment. Therefore, it is urgent in the near future for the healthcare industry to develop advanced and practical health-related technologies and services by leveraging information and communication technology (ICT), and apply them directly in the home environment. In order to track the physical status of the elderly and in the meanwhile keep them healthy, the following two daily tasks are essential: real-time monitoring and analyzing vital signs to early-detector predict life- threatening adverse events, checking whether they are following their prescribed treatment, including taking their prescribed medicine on time. However, with rapidly aging populations, these daily tasks have broughtgreat pressure and challenges to global healthcare systems. Poor medication adherence is a major problem for both individuals and healthcare providers. Technology improvements in healthcare facilities and services are highly desirable to meet the requirements of this giant group. In the meantime Internet-of- Things (IOT) has been recognized as a revolution in ICT. IOT technology provides the possibility to connect sensors, actuators or other devices to the Internet and is conceived as an enabling technology torealize the vision of a global infrastructure of networked physical objects. IOT extends the Internet into our everyday lives by wirelessly connecting various smart objects, andwill bring significant changes in the way we live and interact with smart devices. As part of IOT-intelligent components, radio-frequencyidentification (RFID)tags, biomedical sensors etc. – have been rapidly developed and significantly expanded in scope.A mobile- phone based on telemonitoring system for chronic disease management is presented in. As a result, the physical size, rigid nature and short battery life become limiting factors for potential long-term use. Some research groups focus on the user-comfort issues, by leveraging advanced materials to develop user-friendly sensors In functional textiles are utilized to physiological monitoring, where temperature rate are successfully recorded using fabric sensing elements. Although the integration of textile and electronics improves user comfort to some extent, one drawback lies in the manufacture process, where manual knitting and interconnection make the production costs relatively high .Electronics on flexible substrates, e.g., plastic films, are quite promising for wearable sensors. Owing to their flexible nature,they provide a good fit on soft human bodies. The artificial skinis embedded with temperature and tactile sensors to mimic thefunctions of the real skin. Ultimately, it will be

possible to wrapthe electronic skin around mechanical bones to build a prosthetic hand. However, due to the process variation,mismatches may occur in the fabricated thin-film transistor .As a consequence, the implemented amplifier array presents adegraded signal-to-noise ratio, leading to a noisy or evendistorted output.On the whole, the above-mentioned systems focus either onmaking improvements to a specific condition or developingdevices for a specific problem, which only covers some limitedaspects of home healthcare. A comprehensive solution forin-home healthcare is still missing.Inaddition, the existing systems seldom integrate new materials orapply new manufacturing approaches, which are always the keyelements for bringing new devices or solutions into healthcarefields. By taking the forementioned issues into consideration,an intelligent home-based healthcare IOT system, iHomeHealth-IOT, is proposed in this paper. Theconcept of the iHome Health-IOT System. An intelligentmedicine box (iMedBox) serves as a home healthcare gateway. IOT devices (e.g., wearable sensors, intelligent medicinepackaging (iMedPack), etc.) are seamlessly connected to theiMedBox via a heterogeneous network which is compatiblewithmultiple existing wireless standards. The body-wornBio-Patchcan detect and transmit the user's bio-signals to the iMedBox inreal time. The iMedPack is connected with the iMedBox via aRFIDlink to assist the users with their prescribed medication. All the collected information is interpreted, stored and displayed locally on the iMedBox. The processed information can also be forwarded to the Health-IOT network for a clinicaldiagnosis or further analysis. One major contribution of the proposed iHome Health-IOT system is that it dramatically expands the scope and coverage of traditional Healthcare Information Systems (HIS), extending from a confined hospital environment to a patient's home and body, thus makes it possible to fully realize IntegratedHealthcare Information Systems (IHIS) as introduced. By doing so, the overall healthcare system could be optimized at the top level, turning from the conventional *Enterprise Resource Planning* .as shown in three aspects.

A.Inter- organizational integration of HIS:

The backbone of the iHome Health-IOT system integrates the information systems (ISs) of all the stakeholders that areinvolved in the value chain of Health-IOT. The emerging cloud computing technology has offered a feasible environmentfor such inter-organizational integration towards the so-called Health-IOT-in-Cloud.

B.Cross-border extension of HIS:

The in-home terminal of the iHome Health-IOT system, iMedBox, acts as a bridge with the in-home healthcare devices.By deploying specific applications in the iMedBox, the stakeholders can be seamlessly extended to a patient's home. Thus, the HIS both comes within the context of enterprises andwithin the context of consumers' homes as the so-called Health-IOT-at-Home. This is consistent with thereforementioned trend of healthcare services which are transforming from hospital-centric to home-centric.

C.*Personalized penetration of HIS:*

Personalized services will be the ultimate form of future healthcare. The ultra-low-power and low-cost wearablebiomedical devices, e.g., Bio-Patch, enable the personalized access of HIS to patients' bodies towards a so-called Health-IOT-on-Body. Therefore, the information and communication of HISs can be managed at the level of the bodyof a specific individual. Considering the present and future importance of IHIS and IOT in e-health field, we developed the Health-IOT platformwhich can well find its applications in patients' home and nursing home scenarios. The proposed system takes the advantages of System-on-Chip (SOC) technology, material technology, and advanced printing technology, to build apatient-centric, self-assisted, fully-automatic intelligent in-home healthcare solution. The functions developed can beapplied in various health-related scenarios, including environmental monitoring, vital signs acquisition, medication management, and healthcare services. This article describes thedevelopment of several smart devices, including Bio-Patch,iMedPack, and iMedBox to realize the vision of iHome Health-IoT.

2.EXSISTING SYSTEM:

IOT extends the Internet into our everyday lives by wirelessly connecting various smart objects, and will bring significant changes in the way we live and interact with smart devices. The emerging cloud computing technology has offered a feasible environment for such inter-organizational integration towards the so-called Health-IOT-in-Cloud.

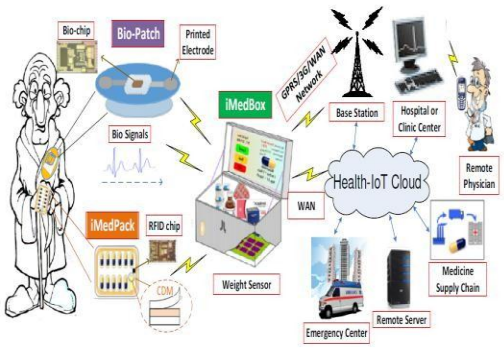


Fig. 1.Application scenario for the proposed iHome Health- IoT system.

E.Network Architecture of iHome Health-IoT System:

The network architecture of iHome . It consists of three network layers: smart medical service layer,medical resource management layer, and sensor data collecting layer. As part of IOT -intelligent components, radio-frequency identification

(RFID)tags, biomedical sensors etc. – have been rapidly developed and significantly expanded in scope.

F. Smart medical service layer:

It is directly linked to professional medical facilities such as hospitals, emergency centers, and medicine supply chain. For example, doctors canefficiently manage a large group of patients. They can inspect the medication history as well as the physiological status historyof a specific patient, make further analysis of a suspicious portion of patient's bio-signals (e.g., ECG) and based on thatmake a new e-prescription accordingly. Also, the doctors can perform an overall examination of a patient group by usingdedicated software which automatically analyzes the variation of an individual patient's physical condition over a period of time, for example, one week or one month. Subsequently, the doctors can easily identify the patient group whose health conditions have improved, and make them aware of their progress. Both patients and their family may feel reassured which helps build positive loops into rehabilitation andself-care.

G.The medical resource management:

The layer works as a transition auxiliary layer, which involves the administration and management of medical resources in an efficient manner and facilitates the smooth operation of the iHome system. In thislayer, cloud computing and services are available to health and life science providers, providing an efficient way for data security and patient privacy protection.

H. The sensor data collecting layer:

It is the basis of the entire network. It consists of data sensing and acquisition devices, local computing and processing units, data storage devices, andwired/wireless transmitting modules. It is a multi-standard wireless sensor platform, compatible with different wired/wireless protocols, such as Ethernet, RFID, Zigbee, Wi-Fi, Bluetooth, and 3G/4G network. With this three-layer iHome Health-IOT system, interaction between clinicalprofessionals and home-stay patients can easily take place on demand or on a regular basis.

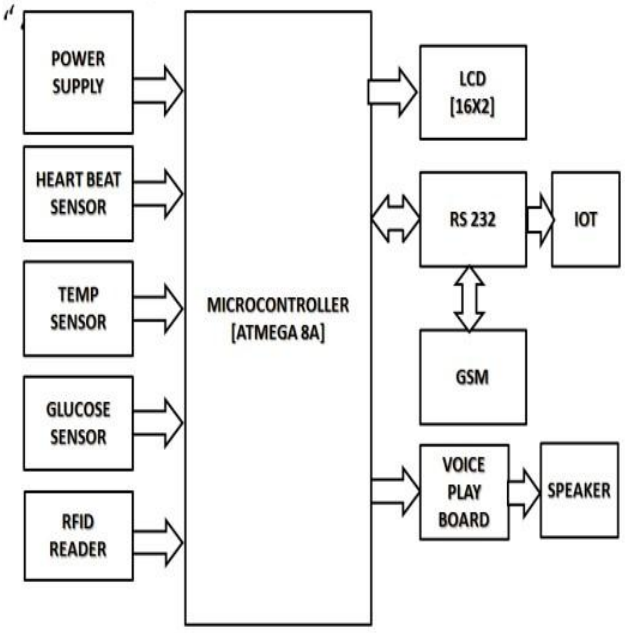
I.Architecture of the iMedBox:

The iMedBox is the central platform of the iHomeHealth-IoT system. The inspiration for the iMedBox comes from the traditional inlies in the fact it is equipped with a high performance and openplatform-based tablet PC and wireless transmission units, so the iMedBox is fully functional as a medication inspector, and anon-site examiner for daily monitoring.The building blocks and interfaces of the iMedBox. An ultra-high frequency (UHF) RFID reader, a high frequency (HF)RFID reader, a Wi-Fi unit, a Zigbee receiver, and a tablet PC with extension ports are embedded into the lid. A high resolution weight bridge sensor is integrated in the bottom of the iMedBox to track the weight variation of the medicine stored in the box, and based on which the dose of medication taken by the patient can be calculated. Wearable medical sensors (e.g., Bio-Patch), intelligent medicine packages, as well as the sensors/devices from third parties can be connected to the iMedBox via various wireless technologies. The iMedBox can serve as an in-home healthcare gateway to gather patients' physiological information, and it candeliver a variety of services such as on-site analysis, health social network, telemedicine, emergency and medication management service

3. PROPOSED SYSTEM:

In this project contains power supply, heart beat sensor, temperature sense glucosesensor, RFID, microcontroller ATmega8A, LCD,RS232, GSM modem, IOT and voice play record, speaker. power supply is used to required limited amount of power and it is passes to the microcontroller. here we are using three sensors. temperature sensor is used to sense the temperature rate then heart beat sensor is used to sense the heart beat rate then glucose sensor is management Diabetes patients. sensor output is given to the microcontroller. radio frequency identification card is available for tracking, RFID tag is attached underneath of medicen box. AVR -8bit micro controller is used.it is advanced RISC architecture because reduced insruction.it is EEROM is used to erase the instruction and also add the new content with the help of flash program memory. liquid crystal display is used to display the instruction here using 16*2 it display only 32 Bit letter.RS232 is communicating device with connect microcontroller and IOT. The purpose of Iot it contains the Ethernet then communicate the phone land mark with help of IP Address.

Block diagram:



GSM is used to send the message about the patient's body condition to the doctor. Finally speaker is used to send the voice transmission from patient to doctor with the help of voice play board.RS232 is communicating device with connect microcontroller and IOT. The purpose of Iot it contains the Ethernet then communicate the phone land mark with help of IP Address.

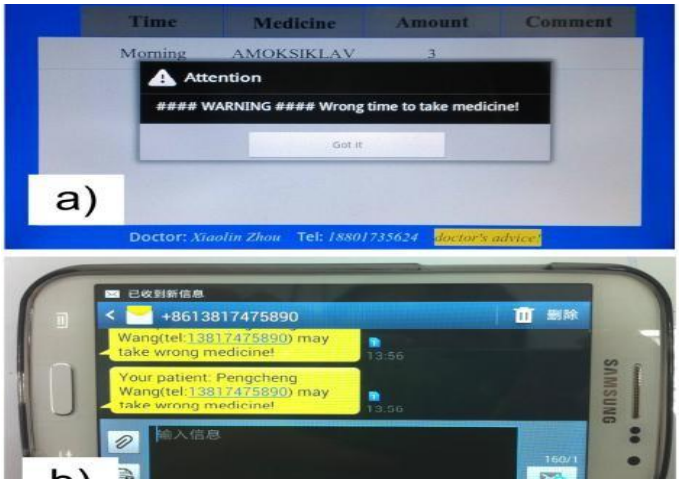
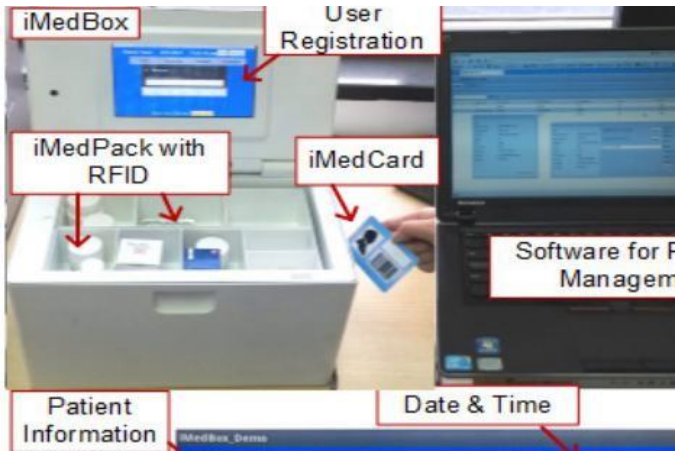


Fig. 2 . The First Aid Alarm of the iHome Healthcare System:
a) alarm shown on iMedBox screen, b) SMS sent to clinical professionals.

4. METHODOLOGY:

The proposed iHome system consists of three key blocks, including the iMedBox, the iMedPack, and the Bio-Patch. It also involves different aspects of the healthcare information system, from the hospital, emergency center, to user's home, body and even medicine. The iMedBox serves as a home healthcare station providing strong interoperability and IoT network connectivity. By leveraging CDM material and RFID technology, iMedPack offers a promising solution for the medication noncompliance problem by automatically reminding the user and dispensing a certain amount of medicine on time according to the on-line prescription.



In order to continuously and unobtrusively monitor a user's vital signs, a miniaturized flexible Bio-Patch has been developed. An ultra-low power, tiny-size, application-specific integrated circuit has been developed to measure Heart beat and body temperature. Inkjet printing technology offers a cost-effective solution for manufacturing electrodes and Silicon-on-Flex integration. A wearable Bio-Patch has been developed for bio-signal acquisition by leveraging the advantages of hybrid integration of silicon-based electronics and printed electronics.. The iMedPack is connected with the iMedBox via a RFID link to assist the users with their prescribed medication. All the collected information is interpreted, stored and displayed locally on the iMedBox. The processed information can also be forwarded to the Health-IOT network for a clinical diagnosis or further analysis. One major contribution of the proposed iHome Health-IOT system is that it dramatically expands the scope and coverage of traditional Healthcare Information Systems (HIS), extending from a confined hospital environment to a patient's home and body, thus makes it possible to fully realize Integrated Healthcare Information Systems (IHIS) as introduced. By doing so, the overall healthcare system could be optimized at the top level, turning from the conventional *Enterprise Resource Planning* .as shown in three aspects.The proposed iHome system consists of three key blocks, including the iMedBox, the iMedPack, and the Bio-Patch. It also involves different aspects of the healthcare information system, from the hospital, emergency center, to user's home, body and even medicine.

5.CONCLUSION:

In recent decades, the rapid growing of aging population has been a challenge to global healthcare systems. Many countries have been active in undergoing hospital restructuring through optimizing medical resources and increasingthe use of home healthcare. This paper presents an IOT-based intelligent home-centric healthcare platform (iHome system), which seamlessly connects smart sensors attached to human body for physiological monitoring and intelligent pharmaceutical packaging for daily medication management. The proposed iHome system consists of three key blocks, including the iMedBox, the iMedPack, and the Bio-Patch. The iMedBox serves as a home healthcare station providing strong interoperability and IOT network connectivity. By leveraging CDM material and RFID technology, iMedPack offers a promising solution for the medication, non-compliance problem by automatically reminding the user and dispensing a certain amount of medicine on time according to the on-line prescriptionAn ultra-low power, tiny-size, application-specific integrated circuit has been developed to measure heartbeat rateand body temperature, diabetes management. By connecting the iMedPack, Bio-Patch, and the back-end services through a wireless link, the iMedBox can deliver various services, including real-time bio-signal monitoring, local analysis and alarm, remote diagnosis and prescription, as well as medication non-compliance control.when a critical situation arise for the patient during unmonitored condition emergency alert will be sent to doctor. The iHomeHealth-IoT

system combines the health social network, telemedicine, emergency and medication management services. It will speed up the transformation from Hospital-Centric medical treatment to Home-Centric healthcare.

6.COMPARISON:

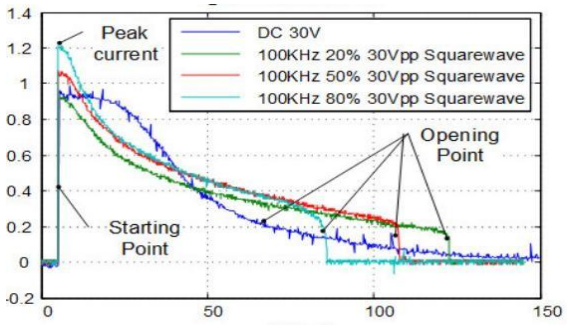


Fig. 3. Current waveform of 1 cm CDM driven by 100 kHz square-wave with Vpp of 30 V and duty cycle of DC, 80%, 50% and20%.

Existing system	Proposed system
Bio chip	Bio medical sensor.
Difficult to design	Easily design.
High cost	Low cost.
Message alert	Speaker,LCD.

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