Effectiveness of Internet of Bodies Based Health Monitoring Systems

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Abstract- *Now a days, technology has moved forward as "sensor technology", miniaturization of devices an wireless networking helped the design and greatly increases wireless technology(networking sensors), by making it able to computer view output and not depending on the control of air (radio waves or radio networking).As one of the most important application of sensor network for human health monitoring using wireless sensor network ,which has been placed trickly ,through wireless network such as-on the body, in the body or by embedding devices to body of human begins and is known as Wireless Body Area Network (WBAN) ,due to this WBAN we can administrate or pay attention to health issues of human body facing in day-to-day life, and can provide feedback and implement the health issues on real-time basis to the person through giving medical treatment using WBAN .In other words, Internet of Things(IOT) is just moved inside the body of human being and thus have become to known as Internet of Bodies(IOB).As a result, IOT has the power to make connection between everyone and anything. These two networks joined as complete unit provides power to make connections between everything and any thing. This paper is a work space on got mixed together IOT and WBAN.*

Keywords- Wireless sensor networks, Wireless communication, Sensors, Medical services, Body area networks, Monitoring, Biomedical monitoring.

I. INTRODUCTION

A long as, IOT or IOB has become comfortable by knowing more about us, than we know about ourselves through Apple watches and transmitting our every movement. On Januray 5,their was a program called 'Annual Meeting of American Law School(AALS)' was associated in New Orleans and has been entitled as "INTERNET OF BODIES". At these program the discussion was legal and living has the impact of this new living and breathing platform for data discovery.

Over the past few years, technology has increased in healthcare and medical activity have grouped together with increased in AI to make a new technology without a fear and the existing technology of IoT is so-called termed as Internet of bodies.

In place of simply hooking up by numbers, electronic devices and connected attempts(objects) to stop to the net, as with the net of things, we are now hooking up to do with man(human) bodies to the Internet.

Our wearables are became expert with special knowledge ,now as Internet of Things(IOT) devices.So, to note as being different from other non-health devices, we could name this a division as the Internet of Bodies (IOB), these apparatuses are designed to put on our bodies (on the inside(internal) or on the out-side (external) and to measure different wellness and /or being healthy parameters.

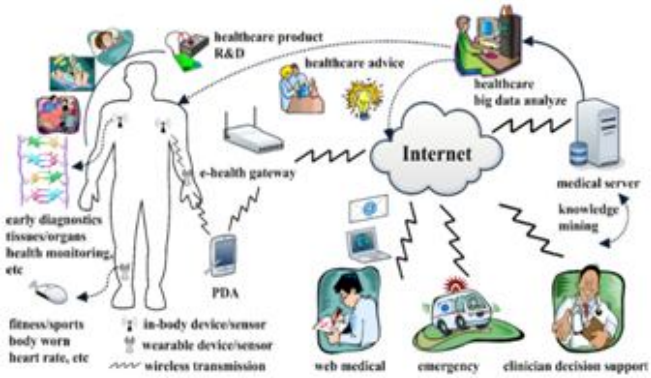

Figure 1: Internet of things and Internet of Bodies

II. HOW THE TECHNOLOGY WORK

AS THE INTERNET OF BODIES ARE DIVIDED INTO THREE PARTS:

1.1) BODY EXTERNAL DEVICES:- It include Fitbits and Apple watches.

1.1.1) FITBITS:

The fitness tracker on your wrist may be sign of the Internet of Things, but it is just one node resting on top of

communications, analytics, policy, and even behavioral infrastructure. The "Internet of Things" (IOT) is often described as a collection of connected sensors, but it is actually a much more complex concept.

It involves not only the connection and integration(power) of devices that monitor the physical world—temperature, pressure, altitude, motion, proximity to something else, biometrics, sound, images, and so forth—but also the aggregation, relationship, and analysis of the information those devices create in order to take action on the situation, and the business and technology changes required to use the data and analyses.

Figure 2: Fitbits (fitness tracker)

Some IOT devices—perhaps 20 billion or so—are already in place and connected through the Internet. However, this is only a small percentage (perhaps 1 percent) of the potential total. More importantly, the activities thus far to integrate, standardize, relate, and take action on IOT devices are at a similarly early stage.

1.1.2) APPLE WATCH:

Apple Watch will power the internet of things.Apple Watch and Internet of Things (IOT) applications in healthcare. He talks with SearchHealthIT about the future of Apple Watch in healthcare, which he thinks is robust; improving the patient experience through using IOT in healthcare; and the benefits and dangers of sharing data generated by wearable health technology devices.

Figure 3: Apple watch

Apple Watch is a water resistant and appropriate for use when swimming, it still supports Apple Pay, and it includes all of the health tracking features available, monitoring steps taken, calories burned, stairs climbed, and heart rate. There's a 50 percent louder speaker for use with Siri, phone calls, and Walkie-Talkie, and the microphone has been relocated to reduce echo. Inside, the Apple Watch features a faster, more efficient S4 chip that offers 2x the speed, along with a new W3 wireless chip.

1.2) BODY INTERNAL DEVICES:- It includes internet – connected pacemakers, cochlear implants, and digital pills .

1.2.1) PACEMAKERS:

A pacemaker is a small electrical device, fitted in the chest or abdomen. It's used to treat some abnormal heart rhythms (arrhythmias) that can cause your heart to either beat too slowly or miss beats. Some pacemakers can also help the chambers of your heart beat in time.

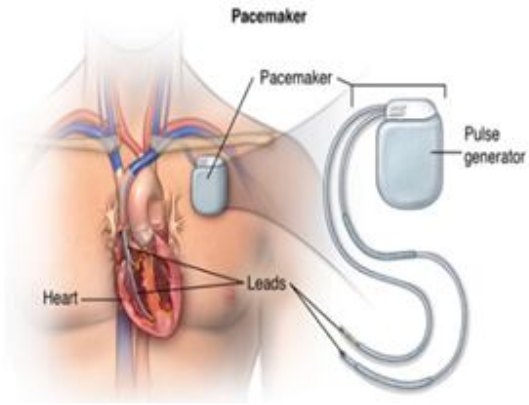

Figure 4: Affixed Packmaker

How does a pacemaker work?

Your heart's sinus node is your natural pacemaker (located in the upper right chamber of the heart). It sends an electrical impulse to make your heart beat. The job of a pacemaker is to artificially take over the role of your sinus node if it isn't working properly. Electrical impulses are sent by the pacemaker to stimulate your heart to contract and produce a heartbeat. Most pacemakers work just when they're needed – on demand. Some pacemakers send out impulses all of the time. This is called fixed rate. Pacemakers do not give your heart an electrical shock.

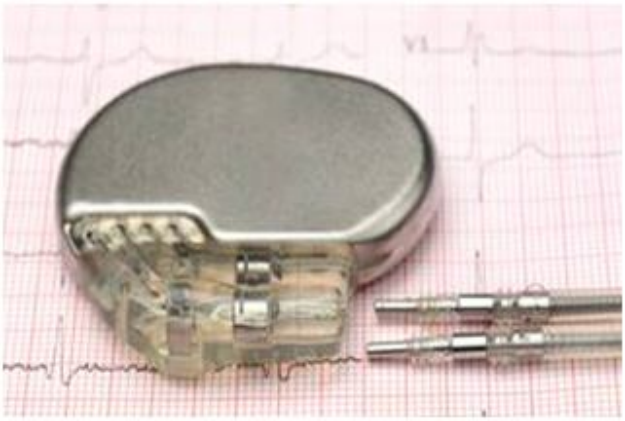

Figure 5: Pacemaker Device

How are pacemakers fitted?

Pacemakers are fitted under a local anaesthetic with sedation, so you'll feel very sleepy. It typically takes between one and two hours to have one fitted, but it can take longer if you're having other heart surgery at the same time.

1.2.2) COCHLEAR IMPLANTS:

There are two main components to a cochlear implant system: the sound processor and the implant itself. They bypass the part of your ear that no longer works and deliver digital sound signals right to your hearing nerve. This lets you hear everything you want, from conversations in noisy restaurants to leaves rustling in the wind.

Figure 6: Affiixed cochlear

1.2.3) DIGITAL PILLS:

The Internet of Things refers to how everyday devices are becoming connected or digitised with technology. Who would have thought that pills could be digitized and that prescribed medicines could become part of The Internet of Things? It happened this past November when the FDA (Food and Drug Administration) approved the first pill with a digital sensor. What does this mean for medicine? It means that the prescribing doctor can be notified when a patient takes their medication; or maybe even more importantly, if they didn't take their medication as prescribed.

Figure 7: Digital pills

How Does a Digital Pill Work?

The pill with sensor system works by sending a message from the pill's sensor to a wearable patch. The patch transmits the information to a mobile application so that patients can track the ingestion of the medication on their smart phone. Patients can also permit their caregivers and physician to access the information through a web-based portal. "Being able to track ingestion of medications prescribed for mental illness may be useful for some patients,"

Figure 8: Wearable digital patch

1.3) BODY EMBEDDED DEVICES:-

It is a hardwired technology ,where the human brain and external devices is combined .where a human body has a real time connecting to a remote machine and a live update.

Figure 8: Digital contact lens

In other words, 25 years from now gadgets like smartphones, smart watches, augmented glasses, virtual reality headgear, and the myriad other devices merging humans and the internet may be laughably antiquated. Computers will become so tiny they can be embedded under the skin, implanted inside the body, or integrated into a contact lens and stuck on top of your eyeball.

III. CONCLUSION

This paper focuses on a real-time pervasive healthcare monitoring system using IOT and cloud computing service which are more beneficial for elders and chronic diseases' patients. The current methods available for realization of Healthcare services are surveyed and the challenges that are part of realization are also highlighted. This paper proposes an intelligent real-time patient monitoring system that monitors the subject's vital parameters such as temperature, pressure, fall detection, breath activity and ECG through PHD prototype model as well as detects any abnormality accurately. Appropriate medications are suggested based on the diagnosis of the provided set of symptoms. The system sends an alert message to the caretakers and doctors in case of any abnormality through WBAN. The system enables the clinicians to optimize the usage of available medical resources and minimize the costs in monitoring the patients. In the future, we will focus on improving wearing sensor experience by using softer materials and enabling controlled sharing of information among the doctors, the patient, and the patients' family through social networking paradigm.

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