IOT (Internet of Things) in Health Care

Amit Srivastava *1 , Shivangi Mishra *2, Ayushi Sonkar *3

*1Assistant Professor, Department Of Computer Science, NPGC, UP, India
*2,3 Student, Department Of Computer Science, NPGC, Lucknow, UP, India

ABSTRACT:

The fast growing use of Mobile Technologies and Smart Devices in the field of Health has caused great impact on the world. Applications of IOT in the field of Health is doing miracle day by day. The conventional method of detecting disease or admitting patients has now been replaced by the recent advancements in IOT. With the help of connected or smart devices one can analyze, and upload real time information to the cloud right from ambulance, home, office, anywhere and anytime.In this survey, we will ensure a various survey of applications, future aspects, research difficulties for Internet-Of-Things in Healthcare.

Keywords:Aspects, Recent Advancements, research difficulties, Internet of Things, connected or smart devices.

1.INTRODUCTION

The term IOT, often called Internet of everything, was 1st introduced by Kevin Ashton in 1999.It is the concept of reflecting a connected set of everyone, anything, anytime, anyplace, any service and any network.The main aim of IOT is to extend the benefits of Internet with remote constant connectivity, control ability, data sharing and so on. By using an embedded sensor which is always on and collecting data, all the devices would be tied to global and local networks.Every object which is connect to IOT requires a unique address or identification with IPv6.

A few years ago, the diagnosis of the disease was only being possible after having a physical analysis in the Hospital. Patients had to stay in the Hospital for their entire treatment period and this result into an excessive health cost. There are lot of people in the world whose health may suffer because they do not have proper access to Hospitals and health monitoring. The new Technological advancements that has been achieved through these years has now allowed the diagnosis of various diseases and health monitoring using miniaturized devices. Moreover ,Technology has transformed a Hospital-based Healthcare system into a patient –based system, like various diagnosis like blood pressure, Heart Beat Measure, Glucose level and so on can be done at home without the monitorization of any Healthcare professional.

II. CURRENT APPLICATIONS:

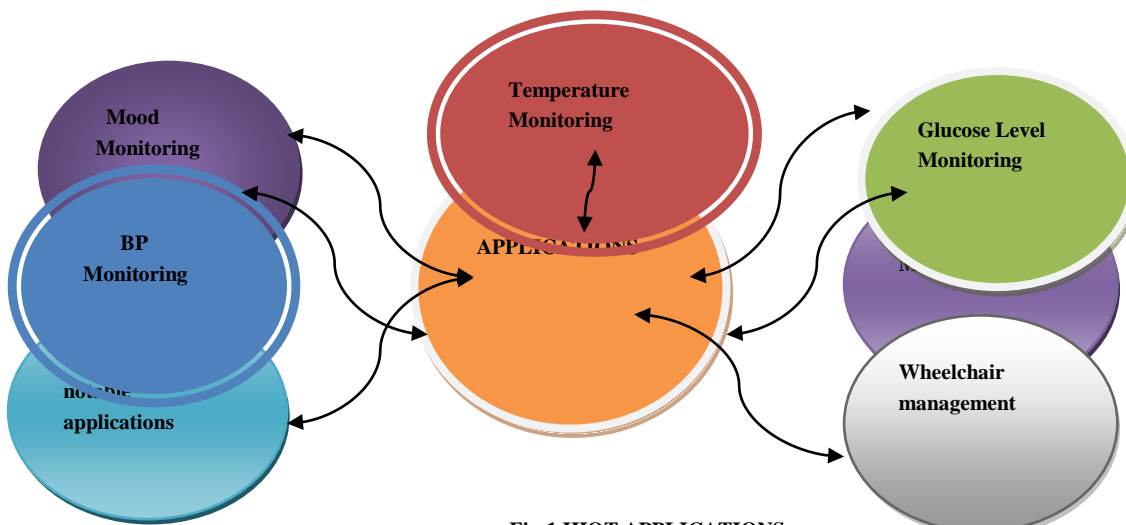**Applications of IOT in the field of Health Care (HIOT):**

Fig:1 HIOT APPLICATIONS

1- **GLUCOSE LEVEL MONITORING**- Diabetes refers to the condition in which the blood glucose level in the body remains high for a long period. It is most common diseases which is found in humans. There are three types of diabetes that generally found, namely, type-I diabetes, type-2 diabetes, and gestational diabetes. The diabetes disease and its types can be identified following three tests, namely, random plasma glucose test, fasting plasma glucose test, and oral glucose tolerance test. However, the most widely used diagnostic method for the detection of diabetes is "fingerpicking" followed by the measurement of blood glucose level.

2- **TEMPERATURE MONITORING**- The human body temperature indicates the maintenance of homeostasis and is an important part of many diagnostic processes. Additionally, some change in body temperature can be a warning sign in some illnesses such as trauma, sepsis, and so on. Checking of the change in temperature over time helps the doctors to make inferences about the patient's health condition in many diseases.

3- **B P MONITORING**.-Blood pressure monitoring is one of the compulsory procedures in any diagnostic process is the measurement of blood pressure (BP). The most important method of measurement of blood pressure requires at least one person to do the recording. However, the integration of IOT and other sensing technology has changed the way BP was previously monitored.

4- **ASTHMA MONITORING-.** Asthma is a disease of chronic illness that can affect the airways and may cause difficulty in breathing. In asthma, the airways of body shrink due to the swelling of the air passage. This resultant in many health issues such as wheezing, coughing, chest pain, and shortness of breath. There is no fix or suitable time for an asthma attack to come, and an inhaler or nebulizer is the only lifesaver at that moment.

5- **WHEELCHAIR MANAGEMENT-**Using wheelchair is an inseparable part of the life of patients with restricted mobility. It helps and provide them physical as well as psychological support. Sometimes the application of a wheelchair is limited when the disability is due to brain damage.

6- **OTHER NOTABLE APPLICATIONS**-The application of HIOT is wide and not limited to the aforesaid functions.. Most of the research areas where the integration of IOT devices was not explicitly demonstrated previously are now using this technology efficiently.

III. RESEARCH CHALLENGES & FUTURE TRENDS:

1. **DATA SECURITY & PRIVACY:** It is one of the most notable challenge of IOT in Healthcare Sector. Anything which is connected to the internet can be hacked and IOT devices are no exception. Due to sensitive nature, Healthcare technology requires layers of security nature and regulations to protect the patient privacy. A private IOT network is an essential point. VPNs, APNs and IPSEC protocols create a private environment only accessible by authorized devices. These are the efforts that keep data contained within the private network and off the general internet. However ,they work in tandem with robust data management practices, clear boundaries of ownership and your organization's security rules in the fight against breaches, hacks and leaks.
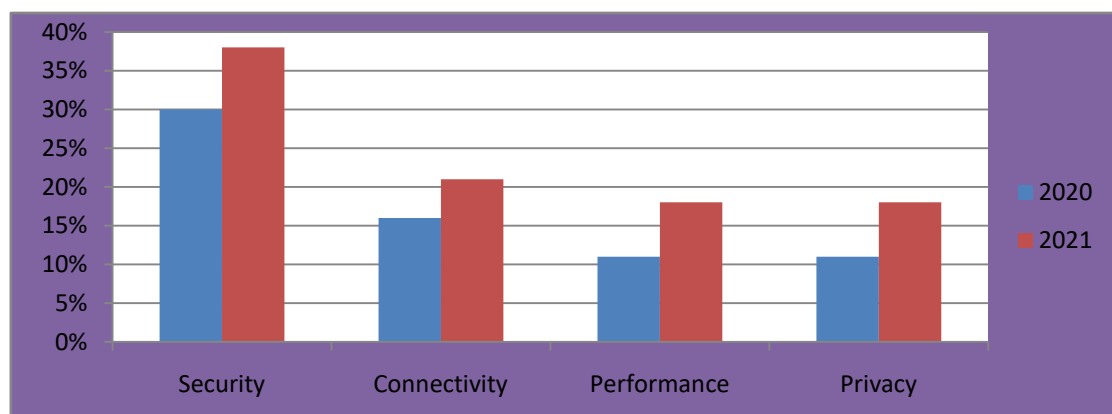

Fig:2 Security Concern of IOT Developers

1. SCALABLE PLATFORMS: For healthcare IOT to succeed, it must be   supported and seamlessly integrate into the greater healthcare system. Doctors, patients and other authorized professionals able to use the devices, monitor their status and/or troubleshoot them remotely. This requires a flexible, scalable and user-friendly IOT platform that can adapt to specific use cases, preferably with a support team to assist with solution design and help ensure a smooth integration.

2. COST: Due to the demands outlined above, healthcare IOT projects can quickly become as cost-excessive, especially in competitive environments where different departments must stake their claims to limited funding. Expert advice through leverages helps to make informed decisions, avoid wasting time and resources, and to help build the business case for your IOT project. Contact us for describing your goals in healthcare IOT and learn more about the most effective solutions.

3. RELIABLE CONNECTIVITY: Network faults and failures aren't acceptable in devices that require real-time access to data, as many medical devices do. Maintenance of connectivity is especially challenging in mobile devices like wearables, which travel anywhere the patient does, across borders and coverage zones.
 The Cellular connectivity is one the best solution for IOT deployments that cover a large geographical area. Due to an open roaming, non-steered SIM card, IOT devices can automatically switch between networks and stay connected to the strongest available signal. The number of networks accessing depends on the SIM provider's roaming relationships and the location of deployments. For example, JT has global roaming relationships with 500+ networks across 210 countries and territories There are many sub-categories of the cellular connectivity, we must also match the type of network with the price point, speed, and video or voice capabilities that your devices required. Download our quick guide to IOT connectivity to better understand your options.

IV. STATISTICS OF IOT IN TH FIELD OF HEALTHCARE:

1. Nearly 3/5th of Healthcare providers use IOT devices in their institutions.
2. 73% of organizations monitor their patients with IOT devices.
3. 89% of the organizations have suffered from a security breach in their systems.
4. 87% of organizations are planning on implementing IOT in their organizations by 2021
5. Many Organizations feel that IOT has saved costs upto 57% for their organizations.
6. The market value of Healthcare Internet of Things (HIOT) was valued at USD 28.42.
7.Billion in 2015 and is projected to reach USD 337.41 billion by year 2025, growing at a CAGR of 28.2% for the forecast period.
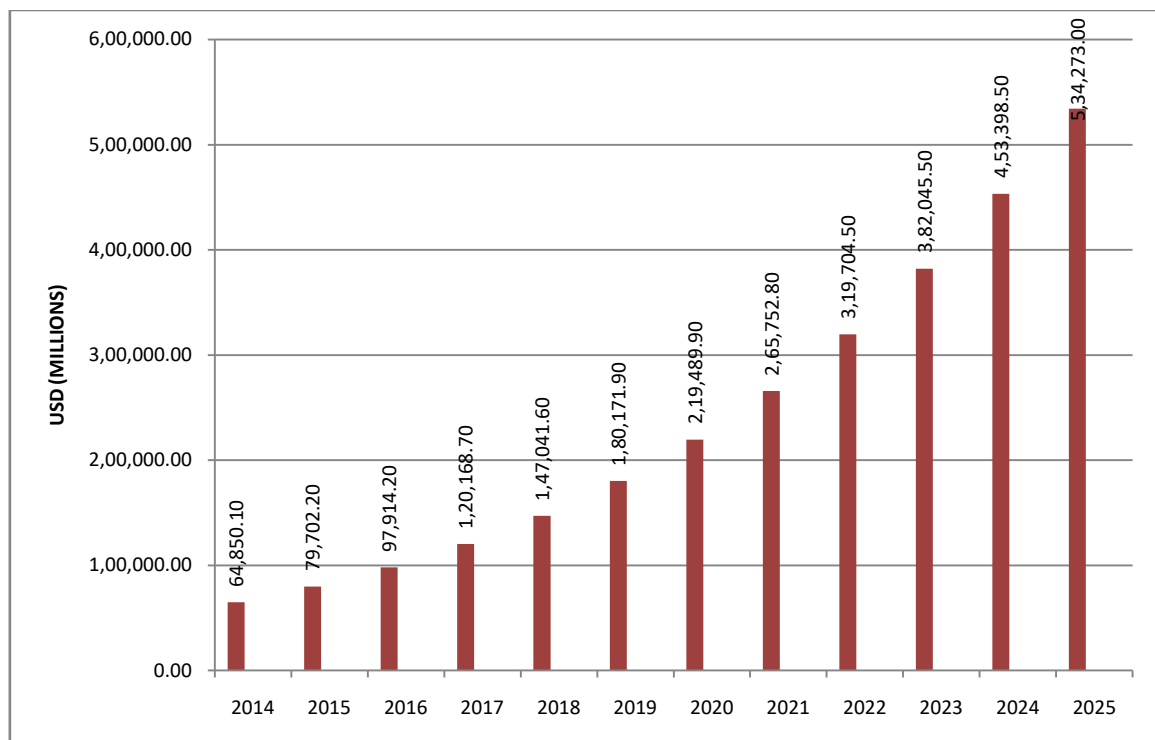

Fig:3 Global IOT in Healthcare Market (2014-2025)

V. CONCLUSION:

This Paper Provides information about the current applications of the HIOT System and their recent trends. Further more future challenges and future aspects ,Statistics

of the HIOT System have been provided. These challenges will create a base for future advancement and research focus in the upcoming years.

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