

An Approach of IOT using Biomedical Electronics

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Abstract- Normal life cannot be lead sufficiently without the help of the health care. IOT is like an interface between human life and healthcare. Biomedical electronics is the basement for IOT. In this paper, we discuss about the basic requirement of interaction with human and healthcare based on biomedical electronics.

Keywords- IOT, Health care organization, Medical data.

I. INTRODUCTION

Wearable sensors are getting popular these days for personal health care, fitness etc. Researchers are considering the application of this technology in health monitoring system for clinical access to patient's physiological information. In future our routine physical examination may be proceeded by two-three day period of physiological monitoring using inexpensive wearable sensors. The sensors would record signals correlated with physiological parameters and relay the resulting data to a database linked with health records. With the help of these sensors, the doctor can do much better examination for our health and recommend treatment. This technology could reduce healthcare costs and improve speed and accuracy for diagnoses.

II. ARCHITECTURE

In a proposed system, wearable sensors measure various physiological parameters such as blood pressure and body temperature. Sensors transmit the gathered information to a gateway server, through a Bluetooth connection. The gateway server turns the data into an observation and measurement file and stores it in the remote server where medical staff can fetch this data through internet. Medical data analyses and visualization are also the key aspects of remote health monitoring system. The challenges like analyses of data of high dimensionality which makes the task of clinicians quite frustrating and error prone can also be overcome by this technology. Integrating into health monitoring systems can increase intelligence, flexibility and interoperability. based devices can also exchange information with each other and can automatically Connect to and exchange information with health institutes through the internet.

III. SYSTEM ARCHITECTURE

Several wearable sensors measure ECG, skin temperature, respiratory rate, EMG muscle activity and they connect to the network through a data aggregator like a smart phone near the patient. It is the process of conveying recording of the patient to the data centre of the health care organization (HSO) with assured privacy,

ideally in real time using internet connectivity on the concentrator. It consist storage, analytics and visualization .It is designed for long term storage of patient's biomedical information and assisting health professionals with diagnostic information. Analytics use the sensors data and help with diagnoses and prognosis for several health diseases. Visualization helps with the data analyzing by making them accessible in a readable digestible format. Wearable sensors can incorporate various physiological measurements and gather data with much finer temporal sampling over much longer longitudinal time scales. These rich datasets need analytics like machine learning algorithms which can recognize correlations between sensors observations and clinical diagnoses .By pooling these datasets across a large user base it can improve medical diagnostics. The use of analytics can improve accuracy, allow earlier detection, enable personalization, and reduce cost by reducing expensive lab procedures.

It helps the physicians readily comprehend the results from the analytics engine about the inter-relation between quantities and eventually start using the sensory data in their clinical practice. The use of color plays a key role in information visualization. Color distance and color category are considered to be effective in allowing rapid identification and comprehension of differences in visually presented data. The leading platforms must be user friendly and must provide simple and powerful application access to the devices. It must provide data to help the designers to rapidly compose analytics application, visualization of dashboards and. The following capabilities are must to make a platform a leading one:

A platform must have easy connectivity and perform management of the device function based on cloud services and to apply connectivity and gain insight of the platform. A meaningful approach for the device and asset improves availability, increases throughout output, minimizes the unplanned outages and also reduces the maintenance cost of the device. Information ingestion: API Bridge is used to divide the data and cloud, making it easier to access the data when needed. IOT cleverly transforms a store's the IOT data. The diverse data is first ingested into the platforms and sources, but essential values are generally extracted from the rich analytics. Reduced risks: notifications and isolated incidents generated at any place in the computer are controlled by the main console of the company. And it's the only single console in the environment of the company. Informative analytics: we must insight IOT of

volumes of data to make proper decision and optimize few operations. We must apply real time analytics to the monitor according to the current conditions and make sure that it responds correctly. We can use reparative cognition analytics with both structured and unstructured data to understand the situations and we must learn as the condition changes.

IV. IOT-THE FUTURE OF PHARMACY

IOT is also expanding its base in the pharma industries as pharma companies have realized that they cannot sustain longer is the market merely by selling traditional drugs .Therefore they are planning to do “beyond the pill” businesses in search to revenues and IOT is proving to be an indispensable tool. The pharma concept helps in patient care and clinical trials through digitalization of medical processes using various IT services. IOT based pharma can prove to be essential in medication management of several illness such as connected sensor wearable’s for Parkinson’s diseases and multiple sclerosis patients ,inhalers and insulin. Pens being added to sensors for further care analytics after collection of data. However this field also requires regulation to ensure data protection of patients as they can avail service across multiple service providers. That’s why pharma companies need to consider data protection and privacy.

V. CHALLENGES FOR IOT IN HEALTHCARE

Considering healthcare practitioners get paid by dealing with patients face to face and they are reluctant to promote technology as there will be non-face to face interactions ,fiscal and policy issues is the first challenge to this sector. But as we adapt to value based care, then there is more scope for new technologies reducing unnecessary in-office encounters. The other challenge revolves around technology because health data is largely fragmented into institution-centered silos. These fragmented data needs to be aggregated using different parameters like standardized vocabularies and message formats.

The aggregation of data serves two purposes.

1. At first institutions no longer need to build data bridges to translate the data structuring but they can simply connect to a central standard ATI “Plug”.
2. The second advantages of aggregated data is it is machine friendly which subsequently leads to effective AI functioning.

In order to provide powerful application access to devices for analytics application and visualization, the platforms must improve some capabilities mentioned below. The devices should easily get connected to perform device management functions. It also helps is gaining insight to apply analytics. Easy device management ensures improved asset availability, minimum unplanned outages which consequently reduces maintenance costs. Intake of data from the cloud

becomes easy if platforms are able to bridge the divide between the data and the cloud. Informative analytics should be able to monitor current conditions to make better decisions and optimize operations accordingly.

VI. CONCLUSION

Basic healthcare is necessary in order to pursue a normal life. IOT plays a very vital role like a frontier between the healthcare and human life. Biomedical electronics forms the crypt for IOT .We have already discussed about the much needed essential to communicate with human and healthcare based on biomedical electronics.

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