TRANSFORMING PATIENT DISEASES DATA USING SECURITY DEVICES ACCESS.

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Abstract:

The new trends in healthcare are gradually progressing with the help of IoT which may make us more health conscious. The systems and security products that connect to the Internet of Things (IoT) are changing the business in numerous industries. Patients and providers immensely benefit from IoT's. It has a bigger presence in healthcare. Some uses of IoT in health care are mobile medical applications and wearable devices that allow patients to capture their health data. Hospitals use IoT to keep check the location of medical devices and patients. This article briefly reviews the concepts, applications and various existing technologies for healthcare. It briefly explains the scope and techniques of IoT in personalized healthcare. It also explains on how to translate patient diseases data for internet thinking that can be accessed through mobile.

Keywords ─ **health care, security information, eye visual.**

1.INTRODUCTION :

In the current technology enabled world, changes are rapid and the status-quo is constantly disrupted. Internet of Things (IoT) is one such disruption happening right now, which has the potential to change the way healthcare is delivered. There are no standard definitions for the Internet of things. As per the definition of Gartner [1], "Internet of Things (IoT) is the network of physical objects that contain embedded technology to communicate and sense or interact with their internal states or the external environment". The IERC definition states that IoT is "A dynamic global network infrastructure with self-configuring capabilities based on standard and interoperable communication protocols where physical and virtual "things" have identities, physical attributes, virtual personalities, intelligent interfaces and are seamlessly integrated into the information network." The IoT allows people and things to be connected anytime, anyplace, with anything and anyone for ideally using path/network to service the main contributor for the IoT and can be attributed to the growth of smart phones and tablets. These mobile devices act as a window to the IoT world. They have the capabilities to perform the wide variety of tasks for the patient & doctors, in addition to providing mobility and connectivity. The mobile revolution is pushing the connectivity of other physical objects seamlessly, by using the cloud storage. As more and more devices are connecting and communicating with each other, huge volume of data is exchanged. This explosion of data needs to be stored and analyzed with complex data analytic techniques to provide the necessary information for both the patient and doctor. However, in the current trend, only the medical devices within the hospital infrastructure are connected within themselves and this network provides access through medical apps available to the clinicians.

2.Healthcare trends:

The current trends in the healthcare can be classified in multiple ways based on the perspective of the technology, functionality and the benefits. There is a trend happening with the convergence of consumer devices and medical devices. Most recent Smartphone's are being launched with health sensors in the accessories like wrist gear. The use of mobile and wireless technologies in the practice of medicine and the monitoring of public health helps the doctors and clinicians to monitor the patients with ease. This reduces medical errors based on continual monitoring practices. IoT applications in healthcare can be grouped into the following categories based on the functionality.

1. Tracking of objects and people

2. Identification and authentication

3. Automatic data collection and sensing.

Health trends can be analyzed with respect to the application areas in medical practice. Some of the application areas are listed below along with the usage of IoT concept and their benefits.

3.APPLICATION AREAS IN HEALTHCARE WITH IOT:

3.1.Wireless patient monitoring: This application is for remote surveillance of patient vital functions through the use of internally and externally located patient devices. As opposed to discrete interactions, the provision of healthcare is moving to a model where information is being transmitted and shared in real time between individuals and caregivers. This is especially relevant for chronic disease management such as hypertension, diabetes, coronary heart disease and asthma. Examples:

Wirelessly monitored pacemakers and automatic defibrillators.

3.2.Mobile system access: This application is based on the mobile technologies that enable remote/virtual access to current clinical systems like Electronic Health Records (EHRs), Picture Archiving and Communication Systems (PACS), etc. All the medical system can be automated with mobile app interface which is easy to use. This application of technology in healthcare is referred as e-Health. If the mobile is used as monitoring and delivery of healthcare, the application area is termed as m-Health. Examples: Websites, portals, mobile apps.

3.3.Medical devices: This application is used to capture and track key care compliance and disease management data. Mainly these are used as fitness solutions for the tracking of patient activities and smart diagnostic devices used for capturing the data from the sensors for further analysis by the doctor. Google glass is also under research for possible medical devices as this can be used to perform assisted surgeries and recording, etc. Examples: digital glucometers, blood pressure devices, pedometers, Wearables – fitbits, Google glass, etc

3.4.Virtual consultation (telemedicine): This application is based on the remote connectivity and multimedia solutions that enable virtual care consultation, education, medicine delivery and therapy procedures as shown in Fig 1. In some countries, appointments and wait times are getting longer. Through virtualization, the majority of routine care can happen within minutes and even seconds. The remote diagnostic screening has become common in some countries and markets. There is a possibility

to see the advent of telesurgery for routine procedures using robots and nurse assistants. Examples: Tele-consultations, mobile video solutions

4. NEW UPDATE IDEA PROCESS:

4.1.Implement to team in real-time telemedicine eye clinic

Telemedicine deployment team has setup the temporary eye clinic and the operating room by using the tiny cabin provided to them at the Syrian refugee camp in Duhok. The team arrived with the telemedicine field kit along with surgical equipment and medicine. This telemedicine kit features all the basic healthcare diagnostic devices like stethoscope, heart rate, blood pressure, pulse oximeter, ultrasounds and otoscopes, dermascopes which are connected remotely with the doctor. Based on the need of the doctor, this kit can be customized with the selected list of diagnostic devices. In this case study, the eye doctor needed an ophthalmoscope and it is included in the kit as shown in Fig 3. All the diagnostic devices transmit the data to the doctor in real time along with video conferencing capabilities. This field kit can be easily operated by the field service technician with a little overview and training. A long line of refugee patients were treated by the medical team. The team started operating on patients continuously just by using the power generator. They were able to setup the remote eye clinic and operating room and perform surgeries locally within few hours.

Figure 1. Telemedicine eye clinic

4.2.Hospital database reports with security analysis:

In the paper healthcare, cost and schedule are constantly negotiated with the sponsoring team. However, the quality factor is not negotiable since this is a healthcare project. Risk management is another important aspect of this project considering the safety of the patients with insufficient diagnostics. There are strict regulations that are being practiced by clinicians on how they should perform the diagnostics and prescriptions. Hence, the health workers and program manager are playing only the facilitating roles to connect with the doctors. Also, the intelligence built into the clinical pathways are agreed and signed-off by each clinician individually. This project deals with three important stakeholders such as healthcare workers, program manager and management/doctors. The data collection program manager feeds the data to the clinician through the internet. There is a central data server established for storing the entire patient's data. This can be used for data analytics to identify the trend of diseases in this particular area which can be predicted and controlled efficiently.

5. CHALLENGES:

IoT world has challenges in many directions including technical, regulatory, market-based and socio-ethical considerations. The center of focus is on protecting privacy as this is the primary cause of other challenges including government participation. Integrated effort from the government, civil society and private sector play an important role to protect these values. The development of the IoT will be hampered if not prevented.

5.1.Lack of government support – The government and the regulatory bodies like FDA should come and play an active part in bringing up the regulations by setting up the standard committee for IoT devices for safety and security of the devices & people.

5.2.Safety of patients – Most of the times IoT devices are left un-attended since they are attached to the real world objects. Due to purpose and nature of IoT devices, if used on patients as implantable or wearable, it can be life threatening .So they are considered as very critical.

5.3.Security and personal privacy - Security vulnerabilities and improvements have not been well researched. The IoT in healthcare should ensure confidentiality, integrity, and availability of patients personal data.

5.4.Design challenges: - As the technology is improving at a faster rate, the design challenges can be met in the near future. Nevertheless, these are still challenges as on today while designing an IoT based system.

Figure 2. Hospital data store and transforming to Iot devices

6.INGESTIBLE SENSOR FOR SENDING CURRENT STATUS WITH HAND DEVICE :

The ingestible sensor is the sensor based technology which is swallowed as a pill. It's made entirely of ingredients found in food and activated upon ingestion. This is taken alongside the prescribed medications, i.e., capturing the exact time of ingestion for tracking the compliance to medication. The ingestible sensor is powered by the human body fluids. There are no battery and no antenna. After the pill with the ingestible sensor is swallowed, a stomach fluid chemical reaction provides required power source and activates the sensor. This sensor remains in the patient's stomach and provides real-time information about how the patient responds to the medicine. The patients do not have to endure blood tests, x-rays, or biopsies for their doctors to determine whether a drug is working. This can be especially helpful for patients who regularly take medicine for chronic devices. After activation this sensor generated, transmits the unique number. The patch, body-worn and disposable, captures and relays your body's physiologic responses and behaviors. It also receives the unique information from the ingestible sensor, detects heart rate, activity and rest and sends information to your mobile device. Then these inputs are passed on to the central gateway to the secured data server. This input is further distributed to needed healthcare providers.
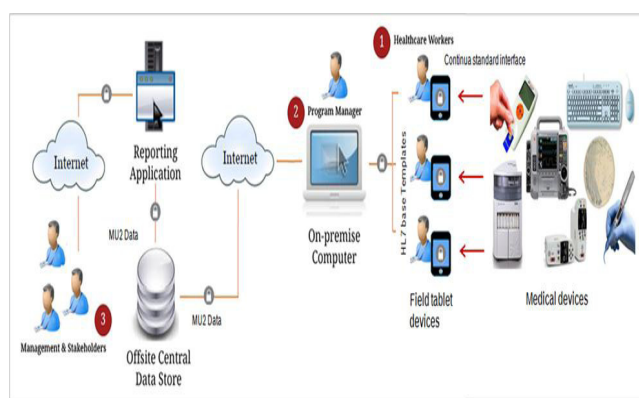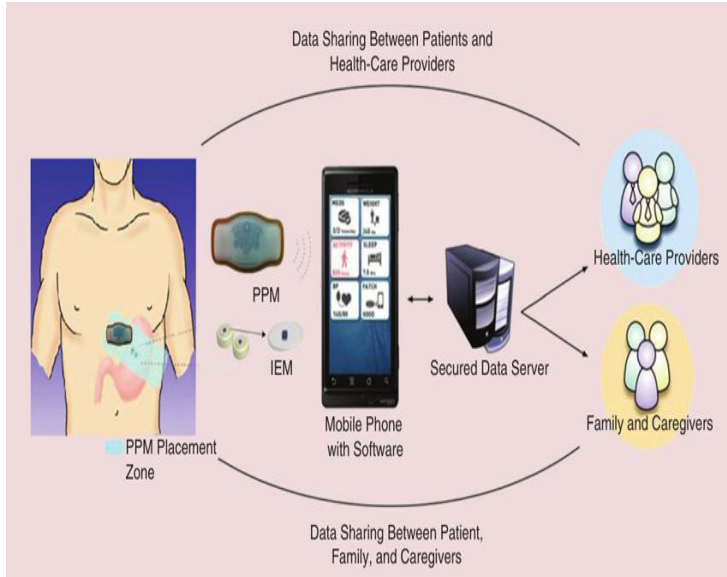
Figure 3. Sensor Iot devices

7.CONCLUSION:

In this paper, the report to all the physical objects which will work systematically with machine-to-machine and human-to-machine interfaces are studied. Inputs shall make it possible to predict the health trends and allergies of the person; thereby the technology can provide customized recommendations on suitable physical activities, diets, etc. This mobile access is very helpful to doctors and patients. They should work collaboratively with the doctor. In this approach of complementing the doctor with the technology based inputs, the new trends in IoT has the capability to transform the way the primary healthcare is delivered to the patients. However for the developing world, IoT brings new delivery model for healthcare with good quality in the future. Proposal of IoT healthcare devices in the developing world are remote consulting, handheld diagnostic devices for detecting some diseases like malaria and cholera , etc., It is evident that IoT will facilitate new business models and new healthcare delivery models in the future for both developing and developed worlds, irrespective of the challenges faced at the current time.

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