The Internet Of Things For Health Care Notes

The IoThNet Topology

Transforms heterogeneous computing and storage capability of mobile devices into hybrid computing grids. Heterogenous computing: System that uses more than one kind of processor. Hybrid computing grids: Cloud. Basically the devices and the data providers, i.e. sensors, talk to each other, getting and posting information under the surveilance of a Broker in a central space called the Coordination Space.

The IoTheNet Architecture

The physical elements. Continua Health Aliance recomends the following: An IoT gateway and wireless local network (WLAN) or a personal area network (WPAN) along with multimedia streaming and secure communications between these. According to this article, the IPv6-based 6LoWPAN is the basis of the IoThNet. This is used by sensors and wearables to transmit data. But this doesn't support mobile devices. These instead need HTTP, COAP, and SSL for the application. The transport uses TCP or UDP (WebSockets?) and the network is either IPv6 or RPL. The adaptation is 6LoWPAN Adaptation and the Link and PHY is IEEE 802.15.4 PHY/MAC. To make transfer of data fast for these applications they use a DAG.

The IoThNet Platform

Refers to both the network and computing platform. This may be where middlewares like KAA come in. There is a design for interoperability of hardware and software that includes human-machine interfaces, multidisciplinary optimization, and application management. This is an interface standardization. In one case there is the application of using VITRUS as a middleware, based on an instand messaging protocol, XMPP. Multiple users with multiple sensors need to be able to acess the gateway even with poor connectivity and to do this an algorithm is used to read raw health data from an edge router and parse its data in a predetermined format. A three-layer cloud platform is used to access cloud data and includes a resource layer for controlling the access to data and a business layer for the coordination of data sharing.

IoT Healthcare Services and Applications

This paper splits apart the offer of IoT-based healthcare systems into services and applications. Applications themselves are divided into two groups: single-

condition and cluster-condition applications. The first is for a specific disease while the latter is many diseases treated as a whole.

IoT Healthcare Services

The point of services is to provide healthcare solutions. Thus a service is generically a setup for some kind of solution. Solutions can include notifications, resource-sharing devices, internet services, cross-connectivity protocols for heterogeneous devices, and link protocols for major connectivity. It may also aim to make the discovery of devices quick and secure.

1. Ambient Assisted Living (AAL)
   This is artificial intelligence that is used to take care of the elderly or those who are incapacitated. Its primary focus is to make these people more independent and increase the quality of their life. For AAL, radio frequency identification (RFID) and near-field communications (NFC) are used for passive communication. Keep in touch (KIT) and closed-loop health services are said to help facilitate AAL.

2. The Internet of m-Health Things (m-IoT)
   This is mobile computing, medical sensors, and communication tech for healthcare services. It represents all of IoT for healthcare services, but has some attributes that are unique to it. It has the potential to of m-IoT for the noninvasive sensing of glucose levels. Two challenges in this are context-aware issues and m-IoT ecosystems. Some of these services are based on mobile message exchange.

3. Adverse Drug Reaction (ADR)
   This is an injury from taking a medication. This is very generic, thus ADR services vary depending on the drug at hand. An example of this is using a barcode through NFC to track whether the drug a patient is using is compatible with logged alergies and other tracked health records.

4. Community Healthcare (CH)
   This involves establishing a network around a local community, like a hospital or a rural community, through a cooperative network structure, and it treats many health requirements as a package. This can be viewed as a virtual hospital.

5. Children Health Information (CHI)
   This can be applied to emotional, behavioral, or mental health. This can also be entertaining for children.

6. Wearable Device Access (WDA)
   This utilizes nointrusive sensors, smartphones, and smart watches. Bluetooth may also be a prospect.

7. Semantic Medical Access (SMA)
   This is basically used for the analysis of large amounts of data, such as ontologies.

8. Indirect Emergency Healthcare (IEH)
   This is used for emergencies and can provide information, notifications, post-accident action, and record keeping.

9. Embedded Gateway Configuration (EGC)
   This connects patients to the internet and other medical equipment. It should allow for automated and intelligent monitoring. This could include mobile computing devices.