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Wireless Sensor Network: A Survey

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Abstract -- Internet of Things is a proposed germinates of internet in which everyday objects had network connectivity, allowing them to send and receive patient data. Wireless sensor network (WSN) refers a group of stereo metrically scattered and devoted sensors for observing and recording the physical conditions of ambience and formulate the collected data at central location. Though tremendous work has been done in the field of IOT concept wireless sensor network plays an important role in monitoring the patients and providing a medication. It is hindered from being beneficial to quality of services. This paper provides a survey on various techniques to address the challenges in wireless sensor networks.

Keywords: IOT, wireless sensor network, Quality of services, GSM, ARM (Advanced RISC machine) server

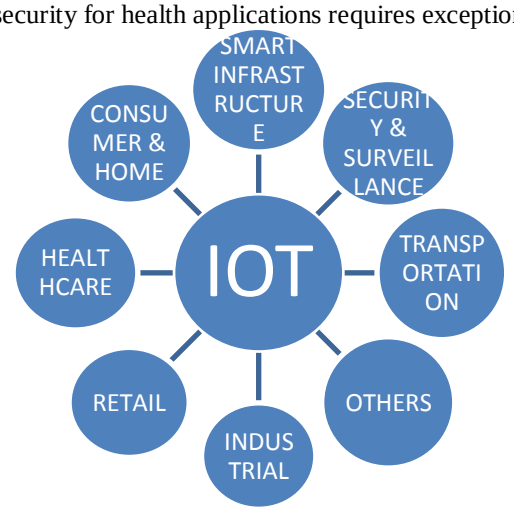
I. INTRODUCTION

The most important aspect of IoT archetype was wireless sensor networks (WSN). The aid of connecting both WSN and IoT component apart from remote access. This assimilation is not sheer conjecture, but a fact supported by international companies. By using the elements of a WSN (sensor nodes) with web services based on SOAP, messaging mechanisms or social network and blogs, had a desirable way to link the data. Nonetheless, by using IP connectivity does not mean that every sensor node should be directly connected to the Internet. Many protests against the QOS and it must be carefully considered. The main challenge was security. The specific challenges that represent in this paper were the certain connectivity exemplary between the WSN and the Internet.

Wireless sensor network make human life more complacent for understanding the critical conditions. The WSN supports mobility, reliability, etc... By using GSM or GPRS, healthcare services can be provide by body sensor network for accessing medical data, audit medical data and communicate with physician by without any disruption in patient's routine life.

Wireless sensor networks (WSNs) are finding applications in many areas, such as medical monitoring, emergency response, security, industrial automation, environment and agriculture, seismic detection, infrastructure protection and optimization, automotive and aeronautic applications, building automation and military applications. A wireless sensor network can be composed of a large number of nodes, constituting a multi-hop network, where vicinity nodes communicate with each other, with routing responsibilities.

Advances in wireless communication and micro-electro-mechanical systems (MEMS) allow the establishment of a large scale, low power, multi-functional, and (ideally) low cost network. Since a wireless sensor network can have many sensing nodes, they have advantages over traditional sensing methods like increase in robustness, fault tolerance and increase in spatial coverage. A wireless sensor network can be easy to deploy in the desired environment, and the information can be gathered, processed and sent to a desired location. For detecting and transmitting the data by network was developed using WSN nodes. Those nodes have a low energy consumption rate and it has a important consideration whereas the network life, unity and security for health applications requires exceptional dependability [1].

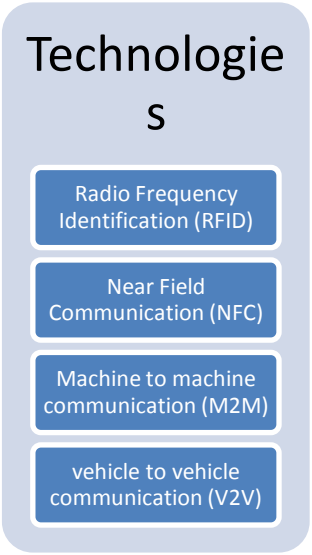


Fig, 1 IOT in Health Care

II. TECHNOLOGIES

A. Radio frequency identification:

RFID is a wireless technology mainly used for transferring and receiving data by using radio waves. For automated identification, wireless microchips were used for tagging objects. Without any line-of-sight, RFID can identify objects wirelessly. It consist of a reader contains a ample of memory and computational resources. Different RFID systems were used In IOT.



Fig, 2 Technologies in IOT

	Active RFID	**Passive RFID**	**Battery assisted passive RFID**
Tag power source	Internal to tag	Transfer from reader through RF	Same as active and passive RFID
Tag battery	Available	Not available	Available
Availability of power	Continuous	Within field of reader	Within field of reader
Required signal strength	Very low	Very high	Moderate
Available signal strength	High	Low	Moderate
Communication range	100 m or more	Up to 10m	Up to 100m

B. Near field communication (NFC):

NFC was a short range, high frequency radio frequency identification technology for exchange information between multiple NFC devices. NFC communication technology based on the radio waves at a limited frequency. It has three types of modes: Reader-writer mode, Peer-to-peer mode, Tag emulation mode. Reader-writer mode was able to use by mobile devices for read external tags or smartcards. And it support technologies are ISO 14443 A/B, Mifare ultralight, NXP DESFire, Sony Felicia. Peer-to-peer was a bidirectional P2P connection for exchanging data between devices. It can be used in many applications like exchange of vcards, handover of tickets, web page sharing, application sharing. Tag emulation was a passive tag for emulate multiple smartcards. When using tag emulation, reader can't distinguish between real smartcard and tag emulation.

C. Machine to machine communication (M2M):

Machine to machine is network device for exchanging the information and to perform actions without any manual assistance.M2M communication was often used for remote monitoring. Warehouse management, remote control, robotics, traffic control, logistic service, supply chain management, fleet management and telemedicine are the important aspect of machine to machine communication. Sensors, RFID, Wi-Fi are the key components. The machine to machine communication comprises four major segments: Wireless sensor networks, access networks, operation management, and application/service. It include industrial instrumentation, authorize a sensor or meter to communicate the data it records to application software that can use it.

D. Vehicle to vehicle communication (V2V):

Vehicle to vehicle communication was the wireless transmission of data between motor vehicles. The main goal of V2V communication was to prevent accidents by allowing vehicles in transit to send position and speed data to one another over an adhoc network. The vehicle's driver may receive a warning should there be risk of an accident or the vehicle itself may take preemptive actions such as braking to slow down.

V2V communication was expected to be more effective than current automotive original equipment manufacturer embedded system for land departure. This technology enables an ubiquitous 360 degree awareness of surrounding

threats. For implementing of V2V communication and an intelligent transport system currently has three major roadblocks: the need for automotive manufacturers to agree upon standards, data privacy concerns and funding.

III. LITERATURE SURVEY

Muneer Bani yassein [1] present health monitoring system that depends on smart health network. This approach classifies the patients into set of clusters based upon health status. QualNet V5.2 simulator is used for managing communication between sensors in patient end and in monitoring centers. The patient with critical status are allowed to continually transmit the health details and the patients with less critical and non critical health status are allowed to transmit partially. The WBAN with reduced jitter, delay between ends and energy consumption is introduced in a real model in Jordanian hospitals.

Neeta Desai, Saniya Ansari [2] Present a wireless reliable system for continuous monitoring of home care patients and it require an energy efficient and reliable monitoring of patient. The main goal is to detect and send patient data over a wireless. This paper provides a suggestion on diet and medication by the doctor from predefined parameters.

Pedro Magana-Espinoza [3] presented by monitoring the rate of motion of patients and heart rate by WSN technology. The WSN architecture is flexible and provides security mechanism for monitoring and store data which can access only by authorized individuals or devices. The PNR algorithm was used to detect falls of patients.

Karthick, C.Suresh Kumar [4] Present a Prototype model for patient monitoring system. Using Zigbee wireless sensor patient data was taken continuously and it transmitted to an ARM server. Embedded processor was used for analyzing the input and results are stored in the database. If any abnormal action is occur automatic sound will arrive and using GSM module, the message will send to the doctor. Keil C software was used to obtain a simulation results.

Khalifa Alsharqi, Abdel Rahim [5] proposed a monitoring system for healthcare and the main problem was the performance for analyzing the patient problem precisely, report the data and evaluate. This system provide online information about health condition of patient based on zigbee and also send alarm message about the patient condition.

Xiaonan Wang, Deguang [6] proposed a paper on all-IP WSN architecture. This architecture was based on a hierarchical address and gateway trees. This system performs on the routing operation without a route discovery and using a home address, mobile node is easily identified. Using IPV6 address, Physician can easily identify the location of patient. And the proposed project based on the simulation.

Anuj.C.K, Lekshmi.S [7] proposed a paper on wireless monitoring system using ARM microcontroller. Using ARM microcontroller, the patients' physical parameter like ECG, oxygen level, blood pressure are measured.

K.Navya, Dr.M.B.R.Murthy [8] proposed a monitoring system using zigbee module. Using the sensor, physical conditions of patients were monitored and it transmitted to caretaker. RS-232 serial port was used to connect the zigbee with PC. For minimizing the consumption of battery, low power amplifiers are used. For contraction its perceptivity to noise, the IR sensor design was enhanced.

S.Rajasekaran, P.Kumaresan, G.Premnath [9] proposed a survey paper on wireless medical devices advantages and technology challenges. Instead of injecting a sensor in patient body different sensors were used for remote monitoring and storing the patient data. This paper mainly focuses on WPAN, zigbee, Wi-fi, WiMAX. Also provide the information about the standards that used in wireless medical applications.

A.AL.Marakeby [10] proposed a paper on WSN technology by using camera. The WSN technology progress was improved by allowing the camera connect to WSN node for transferring video and image. The high demand of bandwidth was the problem in video and image transmission. At node side, WSN node capturing images was scrutinize. The low computational power and memory resource of camera node was optimized by using image processing algorithm.

IV. CONCLUSION

This paper proves that wireless sensor networks can be widely used in healthcare applications and that this research area is in a high activity phase. It surveyed a big set of systems and applications for healthcare, and described the major challenges and evaluating metrics of wireless sensor networks. As the industry provides smaller and feature-rich sensor nodes, to evolve these small bodies, turning their use as natural as cloth wearing. Remote patient monitoring is not a new goal, powered by the advent of mobile systems. However wireless sensor networks provide a low cost means to sensor a given environment for their wireless nature it proves to be adequate for unobtrusive deployment on the patient. Although there are some sensor networks implemented for the medical applications, most of them are still at prototyping level. Wireless body sensor networks are the way to go, but wireless communication mien compelling challenges from the usable range, to the effects on human body.

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