"DIFFERENT TECHNIQUES FOR HEALTHCARE USING IOT SURVEY"

[1]Dr.D.S.Waghole, [2]Sofiya Shaikh, [3]Diksha Ambekar,[4]Pooja Karne,[5]Rashi Shirke

[1]Computer Engineering,

[1]Jaywantrao Sawant College of Engineering, pune, India.

Abstract :

The healthcare industry is in a state of great despair. Healthcare services are costlier than ever, global population is aging and the number of chronic diseases are on a rise.What we are approaching is a world where basic healthcare would become out of reach to most people, a large section of society would go unproductive owing to old age and people would be more prone to chronic disease.

In Healthcare it has several applications.**IoT** explores new dimensions of patient care through real-time health monitoring and access to patients' health data. This data is a goldmine for **healthcare** stakeholders to improve patient's health and experiences while making revenue opportunities and improving **healthcare** operations.

This paper will help to understand the flow of working of applications in healthcare domain also this paper enable the user to learn different IoT healthcare application and uses of the application. This paper also focuses on the use of IoT in remote primary healthcare services.

*Index terms-*IoT,Syncnode,Communication System,Sensors,Healthcare,Medical device.

Introduction-

The **Internet of Things** (**IoT**) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction The rise of IoT is exciting for everybody due to its different scope of use in various sectors.[4]

IoT explores new dimensions of patient care through real-time health monitoring and access to patients' health data. This data is a goldmine for **healthcare** stakeholders to improve patient's health and experiences while making revenue opportunities and improving **healthcare** operations.[7]

Architecture of IoT in HealthCare-

Figure:1.1   Architecture of IoT in healthcare

Figure 1.1 shows that, the application of the Internet of Things (IoT) in healthcare transforms it into more smart, fast and more accurate. There is different IoT architecture in healthcare that brings start health care system[6].

Product Infrastructure: IoT product infrastructure such as hardware/software component read the sensors signals and display them to a dedicated device.

Sensors: IoT in healthcare has different sensors devices such as pulse-oximeter, electrocardiogram, thermometer, fluid level sensor, sphygmomanometer (blood pressure) that read the current patient situation (data).

Connectivity: IoT system provides better connectivity (using Bluetooth, WiFi, etc.) of devices or sensors from microcontroller to server and vice-versa to read data.

Analytics: Healthcare system analyzes the data from sensors and correlates to get healthy parameters of the patient and on the basis of their analyze data they can upgrade the patient health.

Application Platform: IoT system access information to healthcare professionals on their monitor device for all patients with all details.[8]

Literature survey-

"IoT architecture and system design for healthcare systems"[Niharika Kumar,et.al.Issue 14 May 2018].

  This paper enunciates recent advances in the architecture as well as system design of IoT based healthcare systems. Healthcare systems like mHealth and 6LoWPAN based architectures are explored. Healthcare systems involving IEEE 11073 and Constrained Application Protocol (CoAP) are described.[1] Multisensor based system designs that sense blood glucose, body temperature, heart rate and electrical activity (ECG) etc. are explored. The paper provides a comprehensive survey of recent advances in IoT based healthcare system and proposes Intel Curie based healthcare system design[1].

"Internet of Things for Smart Healthcare: Technologies, Challenges, and Opportunities"[Stephanie B. Baker, Wei Xiang Ian, Atkinson;et.al.Issue29 November 2017].
  This paper proposes a standard model for application in future IoT healthcare systems.[2] This survey paper then presents the state-of-the-art research relating to each area of the model, evaluating their strengths, weaknesses, and overall suitability for a wearable IoT healthcare system. Challenges that healthcare IoT faces including security, privacy, wearability, and low-power operation are presented, and recommendations are made for future research directions[2].

"Internet Of Things (IoT) enabled smart autonomous hospital management system - A real world health care use case with the technology drivers"[Muthuraman Thangaraj ,Pichaiah Punitha Ponmalar , Subramanian Anuradha;et.al.Issue 21 March 2016].

[3]This paper aims at explaining in detail the technology drivers behind the IoT and health care with the information on data modeling of medical devices, data validation of critical incident data, data mapping of existing IoT data into different other associated system data, workflow or the process flow behind the technical operations of the remote device coordination, the architecture of network, middleware, databases, application services. [3]The challenges and the associated solution in this field is discussed with the use case[3].

Sr.No	Paper Name	Technique used	Parameters Achieved
1.	IoT architecture and system design for healthcare systems	Constrained Application Protocol (CoAP) ,ECG,mHealth and 6LoWPAN.	Healthcare systems like mHealth and 6LoWPAN based architectures are explored. Healthcare systems involving IEEE 11073 and Constrained Application Protocol (CoAP) are described[1].
2.	Internet of Things for Smart Healthcare: Technologies, Challenges, and Opportunities	Sensors, communication standards,cloud technologies	It proposes a generic model that could be applied to all IoT-based healthcare systems.[2]
3.	Internet Of Things (IOT) enabled smart autonomous hospital management system - A real world health care use case with the technology drivers	Audio,video,multiple medical devices.	It discusses with the implemented real world scenario of smart autonomous hospital management with the IOT.[3]
4.	The Application of the Internet of Things in Healthcare	Sensing,Location,cloud.	This paper reviews the current literature on the IoT in healthcare and discusses its applications and enabling technologies, as well as critical challenges.[4]
5.	A Survey Paper on Internet of Things based Healthcare System	Internet of Things	This survey paper states that how IOT interrelate to various system including the smart healthcare which is one of the prevalent system.[5]
6.	Smart Healthcare Monitoring using IoT	Sensor Technology	. The proposed outcome of the paper is to build a system to provide world-class medical aid to the patients even in the remotest areas.[6]
7.	Internet of Things: A survey of	Wireless Body Area Network(WBAN)	This survey mainly aims at analyzing healthcare

enabling technologies in healthcare and its applications		purpose which is based on digital healthcare system.[7]

Conclusion-

IoT changes the way the facilities are delivered to the healthcare industry.IoT efficiently works in field of Healthcare and difficulties of medical system are solved by IoT. Sensors used in checking vital parameters are easily available and can be used for accurate parameters measurement. Also due to IoT remote health checkups are made possible.Critical surgeries as well as primary healthcheckups can be easily and accurately performed using IoT

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