DHOLE PATIL COLLEGE OF EGINEERING,PUNE
DEPARTMENT OF COMPUTER ENGINEERING

BACHELOR OF ENGINEERING
(Computer Engineering)

Seminar on

IoT IN HEALTHCARE

Presented by - Aarushi Singh

Student Name

Guided by - Vandana Navale

Prof. Guide Name

Contents /Agenda

- Introduction
- Motivation
- Literature survey
- Problem Statement
- Objective & Scope
- System architecture (block diagram, work flow, etc)
- Applications
- Advantages & Disadvantages
- Future scope
- References

Introduction

What is IoT?

The Internet of Things, or IoT, refers to the billions of physical devices around the world that are now connected to the internet, all collecting and sharing data without requiring human-to-human or human-to-computer interaction.

How big is the Internet of Things?

Tech analyst company IDC predicts that in total there will be 41.6 billion connected IoT devices by 2025, or "things."

Motivation

- The monitoring systems limit the patients to the bed and enable them to move around only a particular range from the bed side.

- The traditional forecasting techniques do not provide timely and accurate results.

- Remote patient monitoring system

Literature survey

- **A SURVEY ON HEALTHCARE MONITORING SYSTEM, IJPA, 2017:**
  The use of Internet of Things (IoT) and its e-Health applications in the Tele-medicine health system leads to seamless flow of information between doctors and patients, thus making healthcare cost effective and improving the quality of patients' treatment. This system uses the K53 Tower System platform for e-Health applications to expose the benefits of IoT in medical system. The two fundamental aspects in monitoring people at risk are: 1) Prevention 2) Effective and early intervention during medical emergency.

Internet of Things for Smart Healthcare: Technologies, Challenges, and Opportunities, IEEE, 2017:
Enlisting some wearable Healthcare systems mentioned in IEEE report:
- Pulse sensor
- Respiratory Rate sensor
- Blood pressure sensor
- Pulse Oximetry sensor

Textile fiber optic micro bend sensor used for heartbeat and respiration monitoring, IEEE, 2015:
One study was developed, a fiber optic sensor in an elastic substrate, that was sensitive enough to measure vibrations caused by respiration. This was shown to work in a single test, but it is not known whether it would work well under all conditions.

The Role of IoT in Healthcare, Economic Times, 2017:
With increase in use of IoT, increase of concerns and issues with it are also increasing. As the system continuously monitors and sends reports there are various new problems are arising. The problem of standardization among the devices is a huge concern in itself. Most Healthcare information systems cannot exchange information between them. Either the standards are not completely implemented, or national implementation guidelines simply do not exist. This causes unacceptable risk to patients, inefficient use of healthcare resources and sub-optimal development of medical knowledge.

Simplified structural textile respiration sensor based on capacitive pressure sensing method, IEEE, 2014:
A pressure-type sensor was developed. This was fairly accurate, and far more wearable than the nasal sensor it was compared to. However, the nature of a pressure sensor may mean it is susceptible to noise if it is affected by external pressures, such as while walking into wind

Problem Statement

- With increase in no of IoT devices the concern related to cybercrime and security are increasing as well.

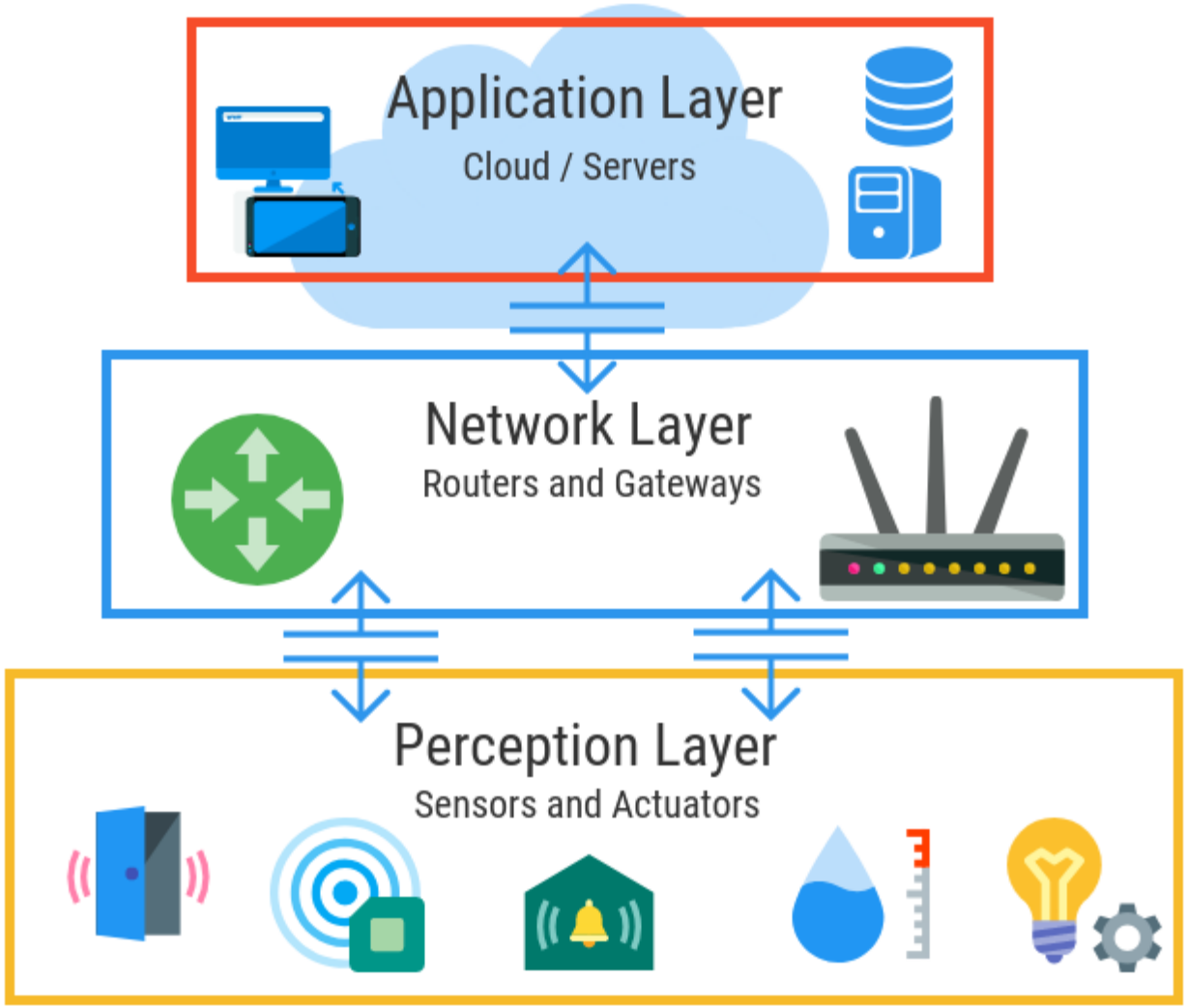
Objective & Scope

- To study the loop holes in security
- To overcome data accuracy and overload
- To overcome integration in devices

System architecture

3 LAYER SYSTEM ARCHITECTURE:

- Perception layer
- Network layer
- Application layer


Application Layer
Cloud / Servers
Network Layer
Routers and Gateways
Perception Layer
Sensors and Actuators

Applications

- Remote Patient Care
- Emergency Care
- Tracking of Inventory, Staff, and Patients
- Augmenting Surgeries / Robotic surgery
- Virtual Monitoring of Critical Hardware
- Pharmacy Management
- Wearables
- Depression and mood monitoring

Advantages

- Cost Reduction
- Improved Treatment
- Faster Disease Diagnosis
- Proactive Treatment
- Drugs and Equipment Management
- Error Reduction

Disadvantages

- Data Security and Privacy
- Integration: Multiple devices and Protocols
- Data Overload and Accuracy
- Cost

Comments

Are these devices really providing facility or just increasing threat?

Future scope

- Better supervision and reporting?
- Lower cost?
- Better authentication and authorization?
- Intro to 5g network?
- Bots or virtual agent to interact with patients?

References

- IEEE, (29 Nov 2017), “Internet of Things for Smart Healthcare: Technologies, Challenges, and Opportunities”, Volume:5, [Online], Available: https://ieeexplore.ieee.org/document/8124196
- Ravi Ramaswamy, (22 July 2017), “Riding Technology: The Role of IoT in Healthcare”, The Economics Times, [Online], Available: https://economictimes.indiatimes.com/small-biz/security-tech/technology/ridingtechnology-the-role-of-iot-in-healthcare-surveillance/articleshow/59710658.cms
- Sasippriya Saminathan et al., “A Survey on Healthcare Monitoring System using IoT”, International Journal of Pure and Applied Mathematics, Vol 177 No. 17, [online], Available: https://acadpubl.eu/jsi/2017-117-16/articles/17/32.pdf
- X. Yang et al., "Textile fiber optic micro bend sensor used for heartbeat and respiration monitoring", IEEE Sensors J., vol. 15, no. 2, pp. 757-761, Feb. 2015.
- S. D. Min, Y. Yun and H. Shin, "Simplified structural textile respiration sensor based on capacitive pressure sensing method", IEEE Sensors J., vol. 14, no. 9, pp. 3245-3251, Sep. 2014.

Questions ?

ThankYou !!!