

# Framework for Smart E-health Monitoring System

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## Abstract

**Objectives:** The Smart E health monitoring system is the today's emerging technology system which tries to provide us risk free environment. The factors which are major for our health problem must be addressed first and make the life risk free. An Internet of Things (IoT) industry is making modern health care with promising technological and social aspects. This smart Health system is based on state-of-the-art network architectures and applications in IoT-based health care solutions. **Methods/Statistical Analysis:** The modern E-health monitoring system is based on real time by using IoT and which is developed by considering the low cost, ease of application, accuracy and data security. By using wearable sensors while holding an Android device. The proposed system is reliable and helpful due to good bandwidth based. It is convenient and reliable and low cost with data security in all aspects. **Findings:** Smart healthcare are future needs which can be use in robotic ruse assistant, artificial retinas, advances in prosthetics, remote patient monitoring, electronic underwear preventing bed sores. This system monitoring the patient heart condition, blood pressure and pulse. **Application/Improvements:** The user give pressure in on his smart wearable device he will be monitored through sensor network system. It will be easy for doctor to check patient health remotely. In this paper, we discuss the proposed model and the opportunities and challenges for smart E-health in realizing this vision of the future of health care. **Keywords:** Android Device, Internet of Things, Smart E- Health, Wearable Sensor

**Keywords:** Building Integrated Photovoltaics, Li-Fi, V2V Communication, Visible Light Communication

## 1. Introduction

The smart E-health monitoring system is the emerging technology of this era. For this remote application with hardware has been designed. This is a complete system with smart Figure

1 monitoring system. Such smart sensing devices are in daily wearable items like shoes and cloths. The proposed system in Figure 1 is based on smarter sensors, which are installed in wearable items of human being like shoes and jacket. The shoe having wireless sensors, which gather the information of user, pressures of foot sole that sense the vital points of patient. The system not only sense but also analyzed the blood circulation and body temperature. This system is designed to sense

all vital reading points of Patient body and pre-inform to doctor. The data which gathered from two wearable devices are sent to remote area through IoT. The system is cloud based medical system with hospital staff. The current system also senses the patient location and track his/her activity and fall detection. Smarter health industry is an industry of this era.

- How is the E-health system different from the current system? Why is it better than the present system? According to existing medical surveys, telemedicine has been adopted to take better care of the patients with cardiac diseases, diabetes, hypo-tension, hypertension, hyperthermia, and hypothermia. The most modern and

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important current application is in real-time monitoring of chronic illnesses such as cardio-pulmonary disease, asthma, and heart failure in patients located far from the medical care facilities through wireless monitoring systems.

- How reliable is the system? An intelligent collaborative security model to minimize security risk.
- How secured is IOT? Is the information contained in E- health system is safe from being misused?
- IoT security and privacy features, including security requirements, threat models, and attack taxonomies from the health care perspective.



Figure 1. Smart IoT based Shoe.

## 2. Overview

### 2.1 Background

The health care industry categories into several areas. The frame work for Figure 2 for defining the sector, the united National International Standard Industrial Classification (ISIC) categorizes the health care industry as generally consisting of Hospital activities; medical and dental practice activities and other human health activities.<sup>1,2</sup>

### 2.2 Description

### 2.3 Significance

## 3. Diagrammatic Representation

Here the Smart IoT based Jacket 3 sense the body medical changes through sensors. After sensing the body different variables (eg. body temperature, blood pressure etc.) it sends to cloud based server through wireless device. The cloud based server having an application running on the server and take the decision and generates the report. After analytical data are gathered it send to doctor with brief description.

## 4. Risk Identification

### 4.1 Schedule Risks

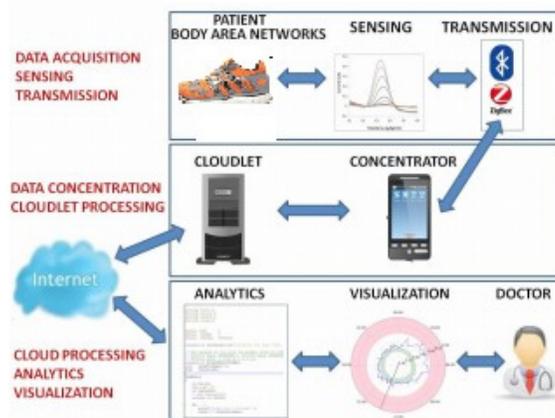


Figure 2. General Framework of cloud base Health monitoring system.<sup>3</sup>

Privacy Hybrid cloud based Secure data storage

## 4.2 Budget Risks

The smooth operation needs continues budget to run the cloud based system and its link.

### 4.2.1 Operational Risks

If any drop of hop link the data will not be synchronized with in time. That might be security risk and break the operation of data acquisition.

## 4.3 Technical Risks

### 4.3.1 Security

For many organizations, security of information is the most critical risk.<sup>4</sup> This may be driven by a need to protect identifiable information, or sensitive information.

### 4.3.2 E-Discovery

For e-discovery detects for the most part that knows specifically where its data is being stored, how it is being backup, and different techniques are used to secure them.

### 4.3.3 Computer Forensics

For many organizations, computer forensics is a critical component of e-discovery efforts and internal investigations, and often requires physical access to the storage device or computing resource.

Some related work is given below:

- Constructing an IoT-aware healthcare monitoring system.
- The focal point in any smart monitoring system is to use low budget wireless sensors. IoT has however eliminated this concept, and it gives communication path.<sup>5</sup>
- In crucial time of health care we need alerts in real time, patients and medical interaction or need advice from doctors. The hospitalization and medical attention at any place is sensitive issue. Which IoT can resolve based monitoring system.
- Exploring Human Body Communications for IoT Enabled Ambulatory Health Monitoring Systems.
- The smart health monitoring system is the demand of this era. The energy efficient device always requires better sensors/actuators.<sup>6</sup> per-

formances. Small-integrated health care sensors may be taken into an account for making low power design. This system is becoming popular for extending exact solution for health monitoring and storing data. Body sensor network application is more workable for communication. The architect for a health monitoring system has designed which gives path to couple of communication channel.

- Smart shoes design with embedded monitoring electronics system for healthcare and fitness applications.

The wearable Medicare health and fitness shoe has been designed. The design module is an integrated monitoring circuit that activates for healthy activity and fitness.<sup>7</sup> This shoe collects medical information. This information is concerned to track, count of steps and monitoring body calorie. The foot oxygen concentration functions on biomedical information. The system is dependent on the movement of load cells and pressure sensors, which ultimately distances wastage of battery usage when there is no load on issuable module is used in communicating data wireless between systems.

- Wearable 2.0: Enabling Human-Cloud Integration in Next

Generation Healthcare Systems.

The efficient development of the Internet of Things, cloud computing and big data are more durable application for enabling human cloud integration. The Quality of Service (QoS) is the key area for any cloud-based system. For Smart services in the arena of smart clothing and advanced technologies of cloud that big data etc. are to provide people with more reliable and smart services.<sup>8</sup> One of the systems wearable 2.0 healthcare to improve QoE and QoS of the next generation. These types of system are based on different types of sensors.

## 5. Smart Health Monitoring using the Advance-Metering Infrastructure

New concept of metering has been introduced are the health industry is called smart metering. Through this we can fetch the health data more accurately, efficiency and it is also low cost as using cloud system. It detects the eccentric abnormal health changes.<sup>9</sup>

## 5.1 Frame Work for Smart E-Health Monitoring System

Here the sensor data acquisition sensing process and data concentration are designed closely related process. The application of sensor sense in Figure 4 unknown variable such as blood pressure, blood circulation and pulse rating required in cloud network. Sensors design start with specifying sensor variables, ranges and functions and then implements them with physical materials and electrical signals.

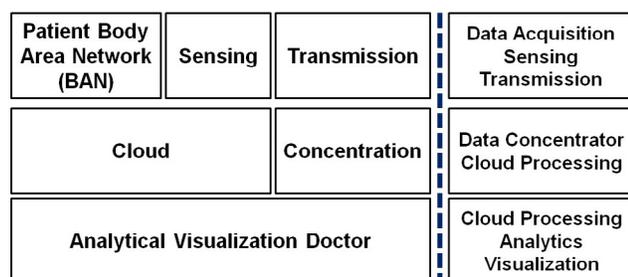


Figure 4. Framework for Smart E-health Monitoring System.

### 5.1.1 Data Acquisition Sensing Transmission

The structure of smart e-health monitoring system sense the pressure through shoe. The sensing device at shoe gathers the information of user and send it to concentration. The transmission will be through Bluetooth to concentration (eg. mobile). Now data concentration cloud processing is a centralized cloud which gather the acquired data and process to send through internet for cloud processing analytical visualization report. Energy efficient FIR filter will increase lifetime of network and FIR filter with less delay and latency will increase performance of network.<sup>10</sup> This now can be analyze the critical medical data and makes its decision.

### 5.1.2 Technical Risks

- Battery failure.
- Failure of signals due to any reason like distortion or power failure.
- Delay of server response.
- Hackers hack the data.

## 6. Conclusion

The proposed framework is helpful to identify both budget related risks and technical risks. However the identify concerns may not be however these concerns may not be

absolute barriers to moving data storage and applications to the cloud environment, clearly they are significant obstacles that will require an enterprise to carefully examine its contractual obligations, risk profile, security infrastructure and oversight ability. An enterprise should be prepared to present the vendor with detailed security and legal requirements applicable to their business needs and the nature of the information being stored or transacted.

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