Cloud Based Smart Health Monitoring System with Big Data Analysis

Introduction

Health care is one of the fundamental needs of human being. The demand of the health care rises rapidly due to the increasing number of ageing patient day by day with insufficient traditional medical services [1-2]. Smart health care is the alternative option for the growing demand of health care services. The smart phones are now available to every people in this ultra-modern age and it can play a vital role to healthcare [3]. In smart health care wearable sensors are placed to patient’s body to collect the physical condition of the patient. The collected information will be preserved in a database. The doctor can monitor their patients at any time from any place apart from their consulting hours and also saves their valuable time [4]. To process the huge amount of data big data analysis algorithm will be used. The analysis helps the doctor to predict the patient condition and takes decision about the treatment.

This research work presents a system to monitor and improve the quality of care for people in remote areas, provide continuous information to patients and doctors to make better healthcare decisions in critical situations. It helps doctors to monitor their patients at all times, regardless of their consultation hours. Better home care facilities and regular updates on the health data to doctors reduce the possibility of inappropriate care. It improves patient care and safety by reducing the total cost of care. The sensors are used to collect patient health data and stores information in a database. The patient's device collects sensor data and automatically sends it to the server, and if the physical conditions are abnormal, the server sends a notification with a message to the doctor. It replaces the process of getting a health care professional at regular intervals to check the patient's vital signs, instead it provides a continuous automatic flow of information. E-health aims to provide low cost use for everyday home use [1]. Martin et al [2] discuss the problems surrounding wearable computer used in health monitoring because the devices provide real-time feedback to the patient. The expansion of information technology into health care tools and services, such as the remote monitoring platform and the mobile health app [3], has created new opportunities for patients and physicians in the health care system and provides an opportunity for remote monitoring and clinically relevant parameters in non-clinical settings [4]. These devices can be integrated into the routine care of acute and chronic illnesses and provide basic management information to healthcare providers and patients [5].

The system suggests strong potential for the use of sensors for health monitoring. we propose a solution for smart health monitoring and planning using Big Data analytics to achieve real-time data processing and decision making in healthcare systems. The proposed architecture is able to perform data processing, intelligent decision making, and self-contained data collection. In this study, Hadoop is selected as the processing unit for heterogeneous data collected from different human body sensors. Hadoop processing is then followed by the generation of intelligent decisions.

**Objectives**

The goal of this research work is to design a system in such way that it is will be easier for doctors to provide medical services to patients. The objectives of the smart health care system can be summarized as follows.

* To provide real-time smart health care services.
* To provide remote mobile health monitoring.
* To reduce the cost for care [5-6].
* To reduce the regular check-up.
* To save the doctor’s valuable time by providing medical service from anywhere.
* To take decision about the treatment using big data analysis.
* User-friendly operation process and physiologic parameters are measured by a sensor and recorded in the database for long run monitoring.
* Easy information sharing between patients and doctors through the web server interface: The doctors and family members can observe the patient’s chronic condition and the doctor can monitor remotely. If farther information required the doctor can share that concerns.
* Real-time response for emergency conditions: The proposed system supports a real time alarming service in urgent situations, such as temperature or heartrate rising or trace condition. So that unexpected events can be handled on time.

**Health Challenges**

Health is primary element that human requires. So physical and mental fitness is very important as it plays important role for development. Now a day’s Global health issue is major concern. Definition of health according to World Health Organization [6] is - “A state of complete physical, mental and social well-being and not merely absence of disease and infirmity.” Most of the countries having health care as their top most concern. The statistics [7] shows the population density of Bangladesh was around 1,252 people per square kilometre in 2016, health issue effect the growth and development of human being. There are many chronicle and non-chronicle disease which plays major rolls in health issue.

**Outline**

Chapter-2 outlines some of the relevant research projects on smart health Monitoring System. Chapter-3 provides the system architecture and design and a basic outlook to the system operation. Chapter-4 provides Full overview of the hardware configuration and working flowchart. Chapter-5 demonstrates the Server design and database management. Chapter-6 tells about the Android Application development. Chapter-7 gives the conclusion and future work.