



# Health Monitoring System Based on GSM And ARM7: A Review

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## Abstract

The increasing rate of population, directly reflect on health issue and social care. Technology dependent livelihood has become the focus point for researchers, to overcome challenges in healthcare field. Technology has play vital role in achieving these crucial tasks. While use of technology solution must be designed, implemented and validated using expert advice. There is genuine need to manage or even reduce healthcare costs while improving the quality of service. In order to overcome these challenges, the real-time monitoring health status of body can be used to identify health status for particular organ; therefore, it enabling early provision of medical facility will be possible. Thus, the development of a Proposed health monitoring system, which has capability of observing bedridden patients remotely, is the focus of the research presented in this paper. The technology used in this paper focuses on the ability to attention on a person's physiological data to detect body health which can helps in cure defects. This is achieved by accurately processing and analyzing the acquired data from sensors while transmitting the detection of a health status. The finding organ health status that will improve clinical decision, it supports for provide treatment.

*Keywords:* Internet of things; hospitals; wearable sensor networks; medication alert.

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## 1. Introduction

We use the Internet of Things in this Proposed system to track various parameters relating to patient health. Using Internet Connectivity, in the patient health monitoring system focused on the Internet of Things concept, the real-time criteria of a patient's health are sent out to the cloud. Such parameters are sent to a remote location on the Internet so that the user can access such information independently from anywhere on the geographic position. However, a patient caregiver can be conveniently tracked remotely by combining multiple technologies, such as Android phone apps, wearable devices and sensors. Healthcare services are most frequently visited in our busy lifestyle to meet the needs of people because the massive population growth of our new and stagnant healthcare systems contributes to more patients. On the other side, the innovation in healthcare to cope with these demographics of modern technologies is still minimal. In reality, like other people, we care deeply of our well-being and are constantly monitoring our physical activities using unique health and activity trackers anywhere at any given moment. Therefore, while we do our daily work, we worry about our sick family member and the wellbeing of people with disabilities as we leave them alone for a long time. Hence, integrating technology such as healthcare sensors and wearable with our healthcare systems is becoming important, so that everyone can reside in a healthier and more comfortable climate. With the rising incidence of chronic diseases associated with ageing, the raising demographic for decades to come would have significant consequences for the health care system. Therefore, they propose a system that calls for continuous monitoring of the well-being of the elderly in real time in order to eliminate chronic diseases, thus eliminating hospitalization that stresses the health systems.

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26th and 27th February,2022

### 1.1. Objective

- Respective sensors check health status particular of body organ and to analyses the body is healthy, seek or damage and based on analysis system automatically send the notification for how to take a precaution.
- Test the health parameter after some time intervals, if any problem arises related to the health parameter of the patient, then the system will automatically send the notification to the relative patient. System detects the affected body organ with the help of sensors, and suggests which medical test is mandatory for better diagnosis.
- System suggests the nearest hospital and diagnosis center's according to your diseases.
- In very emergency situation system send the alert message to ambulance, hospitals or relative with GPS location with the help of GSM modem.
- System suggests the precaution based on environmental parameter for some specific diseases like Asthma.
- System gives the notification for eating a medicine at right time and system prevents you for having overdose of medicine.
- System suggest which medicines are dangerous to any specific diseases.
- System store patient's medical history which helps for better treatment

## 2. Literature Survey

This section explains the study of literature. I have been studying various articles to research the existing system.

Shubham Banka et al. [1], The authors proposed and proved the concept for an automated program that ensures constant tracking of different health parameters and identification of some form of illness or condition that prohibits the patient from repeated hospital visits. The program could be set up in schools, so it will capture so archive large volumes of data in the electronic database.

Amir et al. [2], The entire machine is linked through Wi-Fi module ESP8266. The medicinal details should be entered via the application. The medicine box works once the user has entered the details including the timing and the slot from which the medicine should be consumed. The microcontroller collects information according to the user's given data via the application and feature. The medicine box then produces data according to the patient's behavior and this data is submitted to the application via internet. Such detail is shown in alerts style on the web.

V. Vippalapalli et al. [3], It provides a tele-monitoring program that enables the doctor to display the critical parameters of the patient in real time directly and seamlessly on a web page and does not need to provide any unique specifications on the PC; all he wants is an Internet connection. A home-based LabVIEW application that is embedded in a home PC is required for the patient side

Sadek I. et al. [4], The success of the research work linked to IoT sleep trackers and noticed that it was important to resolve certain issues. In addition, some potential approaches from researchers and security experts are identified for mitigating these threats. In addition, researchers recommend certain things for end-users and service providers to deploy a resilient IoT infrastructure to ensure a secure sleep tracker.

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26th and 27th February,2022

P. Gupta et al. [5], The system's key goal is to provide people with more and more effective health care by creating a networked knowledge infrastructure such that the professionals and physicians can make use of this data to offer a fast and reliable solution. The final model is well equipped with the features that allow doctor to examine his patient from anywhere and anytime. Emergency situation will also be operated on to send an emergency mail or fax to the doctor with the latest state of the patient, including detailed medical records. The software has been introduced as a smartphone device to render the product more available and more usable everywhere in the globe.

D. S. R. Krishnan et al. [6], It takes less than a minute for the health tracking program to measure ECG, Blood Pressure and Temperature Control tests. Scope also declines due to the mixture of no. of medicinal data sensors on a single piece relative to the conservative scheme. Thus, complexity of the time-cost is minimized.

H. N. Saha et al. [7], Authors examined the IOT-based technologies currently being used as smart hospitals, their mechanisms, benefits and disadvantages. Smart hospital or Telehealth has been performing successfully as designed and implemented. Telehealth telegraph has proved to be reliable, powerful and user-friendly device with various advantages. As dynamic as the Internet, the IOT-based health services framework calls for the design of systems that are even more advanced to overcome existing disadvantages.

Sathya et al. [8], Experts also incorporated IoT in centralized control of health networks. The portable sensors with IoT would have an enormous effect on the life of a user, and even if they are away from home and doctor, this allows them to minimize fear of risk. The sensory data may be collected in work settings or at home. In fact, the problems of identifying, evaluating and forecasting the illness are often presented and should be tackled in order to ensure smooth transition into the medical sector.

Poongodi, T. et al. [9], E-healthcare network offers a technical platform that allows use of wearable and implantable health sensors to enable tracking of different variables such as health , fitness, behaviour and other chronic knowledge for the purpose of daily quality of life for individuals. This article's main goal is to explore how IoT may be connected to portable and implantable technologies in the healthcare system. The wearable and implantable devices are likely to revolutionize mobile technology that are presently and in the distant future very old.

Shivleela Patil et al. [10], This prototype offers the real-time solution for reliably observing the patient's heart pulse rate. This system may be adopted in the hospital's general wards to help the patients understand their performance and use. The data collection systems may be further used in other areas, such as illness detection, study, etc. Using this program can may harmful cardiac attack incidents for a patient.

### 2.1. Outcome of survey

In above survey the following are the challenges observed in health monitoring system, in which the proposed methodology tries to overcome.

- i) Monitoring of particular body organ.
  - ii) Analysis of organ health status.
  - iii) In existing system, they can't suggest test for affected body organ.
  - iv) Suggest nearest medical, pathologist center and hospitals.
  - v) There is not any consideration in existing system for environmental parameter.
- In proposed system we will solve this entire problem.

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26th and 27th February, 2022

### 3. Scope of Proposed System

1. The most challenging environment in the medical field is WSN-based health monitoring. This project in our home is for, bedridden patient. For the senior citizen who lives alone or with a compact family, too. Patient presence is not open to anyone. This project will prove very beneficial when family members are forced to go out for any emergency work.
2. Physically disabled patients may take advantage of this initiative. They find it really hard to go to the doctors on a daily basis or for those patients who need the doctor to track them constantly.
3. IOT-based health monitoring is very useful when tracking & documenting and monitoring changes in the patient's health parameters over time. Doctors can refer those changes and the patient's history to the patient when recommending more therapy or medicines.
4. Hospital visits are reduced, because medical care from everywhere is feasible.
5. The time and cost of hospital visits for normal routine check-ups would reduce.
6. Data regarding patient health parameters are stored in the cloud. Therefore, it is more efficient than manually keeping records on typed papers stored in the archives. Or even the multimedia documents that provide a graphical view of state of health. Cloud storage has low data loss risks, and is therefore a secure storage solution.

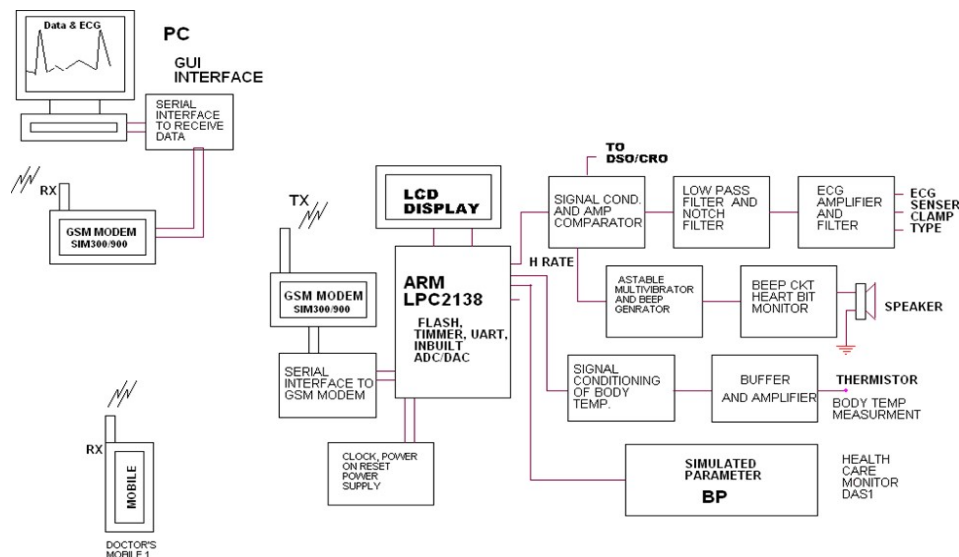


Figure 1. Block Diagram of GSM & ARM based Health monitoring system.

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26th and 27th February,2022

### 4. Expected Outcome of Proposed System

The proposed "GSM & ARM-based health monitoring" model interacts with the health parameter of the patient. Therefore, system scalability and precision will be attempted to achieve high performance in dealing with the health parameter of the disabled and injured and to monitor their health effectively in real time. Furthermore, the program will be versatile so as to extend the population and patients using the system accordingly. In addition to the existing program, we will provide diagnosis of health status, help for recovery from injuries, monitor bedridden patients, precautionary measures according to the medical history of the patient. We are going to achieve machine performance in terms of precision, reliability and scalability.

### Conclusion:

In this paper, the GSM & ARM-based health monitoring framework was introduced to solve the difficulties of providing health surveillance, and to reduce time and cost expenditure through hospitalization. The literature indicates that there is a high demand for an effective health monitoring solution that monitors the organ of the body, decides its health status and recommends medical assistance at home and in real time. Proposal program will contribute significantly to maintaining a comfortable and safe environment for people with bedridden and disabilities. System allows them to live independently by continuous monitoring of their health, without fear of any emergency or vital healthcare situation. In a short time, the device can collect physiological data of patients through wearable sensors and upload it for data storage, analysis and processing to the cloud. If illness is found in the health of the patient, data will be notified to the nurse, and nearby hospital will also be available. System will be designed in dynamic architecture which will be able to successfully scale and grow in future. Thus, the program will provide a cost-effective and reliable forum for tracking patient health.

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