IOT BASED HEALTH MONITORING SYSTEM

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TABLE OF CONTENT

1) ABSTRACT
2) LIST OF QUESTIONS
3) INTRODUCTION
4) LITERATURE SURVEY
5) METHODOLOGY
6) RELATED WORK
7) GAPS IDENTIFICATION
8) ISSUES WITH ALREADY EXISTING SYSTEM
9) FEASIBLE SOLUTION
10) FUTURE SCOPE
11) CONCLUSION
12) REFERENCES

ABSTRACT

IoT in healthcare is the key player in providing better medical facilities to the patients and facilitates the doctors and hospitals as well. The proposed system here consists of various medical devices such as sensors and application based which communicate via network connected devices and helps to monitor and record patients health data and medical information.[2]

The system would be smart to intimate the patient's family members and their doctor about the patient's current health status and full medical information in case any medical emergency arises.[2]

The proposed outcome of the project is to give proper and efficient medical services to patients by connecting and collecting data information through health status monitors which would include patient's Heart rate, Temperature, Blood pressure and sends an emergency alert to patient's doctor with his current status and full medical information.

LIST OF QUESTIONS

1) Are there proper medical facilities in rural area?
2) Is medical health care data properly handled?
3) Is Doctor-Patient ratio properly maintained?
4) Can a common man afford the daily expensive health checkups?
5) Whether the medical equipment's used are safe in rural area?

INTRODUCTION

In IOT there are many devices are connected to each other for communication purpose it shares the data, information and able to produce new information and record it for future purpose. Everyday people require new devices, new technology for make his life easy. The research is always trying to think on new devices for make his life easy. In our day to day life we are facing many problems related to our health because we are not caring about ourself. So, to reduce these problems we are introduced a IOT Based health monitoring system .

Nowadays IoT plays an important role not only in communication, but also in monitoring, recording, storage and display. Hence the latest trend in Healthcare communication method using IoT is adapted and monitored on a continual basis, aggregated and effectively analyzed-such information can bring about a massive positive transformation in the field of healthcare.

Health is a fundamental element of people's need for a better life. Unfortunately, the global health problem has created a dilemma because of certain factors, such as poor health services, the presence of large gaps between rural and urban areas, physicians, and nurses unavailability during the hardest time.

LITERATURE SURVEY

- Recently advancement in MEMS (Micro Electro Mechanical Systems have opened great opportunities for the implementation of smart environments.
- In this field, among the several research activities already presented in the literature, those related on the use of the UHF RFID technology are mainly focused on tracking patients in hospitals and nursing institutes.
- RFID tags can operate only under the reader coverage region, hence the use of UHF RFID technology is limited to patient/devices monitoring and tracking in small environments.
- Another set of related work proposes the use of WSN [Wireless sensor network] technology to implement solutions able to meet the specific requirements of pervasive healthcare applications.
- In a WSN providing patient localization, tracking, and monitoring services within hospital is presented.

METHODOLOGY

- Our system will predict if the patient is suffering from any chronic disorder or disease using the various health parameter and various other symptoms obtained by the system.
- In level-1, Unprocessed data from various IoT devices is obtained and stored on the server and send using the application. These devices include various sensors such as temperature sensor, vibration sensor, BP sensor and pulse sensor.
- In level-2, the relevant information is obtained as a result from the data stored by filtering, classifying and categorizing it. This information is nothing but the patient's real-time health data and symptoms that the patient has. This information will be further used in the next level to predict if the patient is suffering from any kind of disease. This helps to make the system smart and efficient.
- In level-3, we can infer the disease or disorder by using the existing knowledge base and categorize the result in various categories such as Ideal, Normal, and With Symptoms etc.

RELATED WORK

- In existing system Patient and environment monitoring would be considered as an individual application system in healthcare automation environment.
- Integration of both environment and patient monitoring does not exist. Doctor has to generate the patient report in a hospital only. In case of any emergency the doctor at any circumstances must be in hospital to generate a prescription.
- If a doctor is in some other location apart from hospital then doctor may send report via messages or by call which may lead to conflicts. So a mobile based application of a patient is mandatory to the doctor, so that a doctor can provide prescription from any place.

RELATED WORK

- Microsoft Lync is used by Doctor's to offer medical services to patients in rural areas. Samsung has a $50 million investment in digital health through their Digital Health Initiative which is a collaboration of smart sensors, algorithms and data processing techniques through open source hardware and software platforms.
- Amazon offers a unified healthcare platform where the users can access healthcare information, availability of latest products, health insurance and "on-demand" services. Wearables, especially in the form of smart watches or bands, have been revolutionizing the market. Notable products include Fitbit, moov, Proteus, Pebble Time, Withing's AliveCor Health monitor, Beddit and so on. Significant amongst the healthcare products are smart watches.
- The projected annualized rate is expected to reach 70 million units at a growth of 18% annualized rate by 2021.

ISSUES WITH ALREADY EXISTING SYSTEM

1) System can only be used within hospitals.
2) No reports are generated in existing system.
3) Patients are not allowed to access the data which is collected as it is only available for hospital staff and caretakers.
4) No app or website as such to record the data obtained from the sensors and hardware devices.
5) Cost of checkup using this device is very expensive.
6) Patients have to visit the hospital for checkups.
7) Existing system are usually used only by people who are suffering from any diseases.
8) Data collected is simply stored in databases and accessed when required, No analysis is done on the colleded data.

FEASIBLE SOLUTION

1) We will develop an application which will solve the problem of transferring the data in real time and also using this application patient can view their own data and reports and maintain the records of their health checkups.
2) In-case if patient is facing any problem then they can go for second opinion and at that time they don't have to do the reports again as they are already having the records stored in application, this will save time and money of the patients.
3) Attention to personal data.
4) Using the application secure transfer of the data.
5) Better Management of the data.

1) Decreasing operational costs
2) Eliminating system errors
3) Enhancing patient experience
4) Better management of drugs
5) Improving treatment outcomes

✓ Patient-Generated Health Data (PGHD):

Patient-generated health data is any piece of health-related information generated or documented by patients or caretakers. PGHD includes data pertaining to a patient's health or treatment history, lifestyle choices and symptoms among other things that are either reported by the patients or collected using wearables as well as Internet-enabled medical devices.

✓ Home-based care:

Assisted living facilities may not be able to accommodate every senior citizen who lives alone. Hence, medical care providers can identify the ones who are healthy enough to stay at their own homes and help them use IoT-based devices to track their health. By monitoring their condition in real-time using the data collected by those devices, they can instantly attend to the ones who require it.

✓ Short-term care:

Short-term care can be provided to people who have been discharged from the hospital after a surgery or after receiving treatment for an acute illness. This type of care eliminates the need for visiting the hospital during the recovery phase, allowing patients to receive quality healthcare within the comforts.

✓ Preventive care :

Application of the Internet of Things in the healthcare industry can also be useful for healthy people who are not suffering from diseases and wish to prevent problems in the future. Health-related data can be captured by anyone on a daily basis which can be shared with medical professionals. This can help in the detection of even a minor problem and prevent illnesses in the long run.

FUTURE SCOPE

- The proposed system can be set-up in the hospitals and massive amount of data can be obtained and stored in the online database.
- The system can also benefit nurses and doctors in situations of epidemics or crises as raw medical data can be analyzed in a short time. The developed prototype is very simple to design and use. The system is very useful in the case of infectious disease like a novel coronavirus (COVID-19) treatment.

CONCLUSION

The system can be further improved further by adding artificial intelligence system components to facilitate the doctors and the patients. The data, consisting medical history of many patients' parameters and corresponding results, can be explored using data mining, in search of consistent patterns and systematic relationships in the disease. For instance, if a patient's health parameters are changing in the same pattern as those of a previous patient in the database, the consequences can also be estimated. If the similar patterns are found repeatedly, it would be easier for the doctors and medical researchers to find a remedy for the problem .

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