Smart healthcare system using IoT

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Abstract— India is the developing country with growing technology. Various technologies like IoT, machine learning, deep learning, artificial intelligence are emerging in India. IoT is found to be fast emerging technology. With IoT, multiple growth in various fields can be made. Multiple growth in various fields include healthcare, agriculture, industries etc. IoT in health care is found to be more useful. This paper is executed with healthcare. Inorder, to avoid several loss in medical field, IoT can be used. IoT in healthcare can be done with various sensors. Sensors can be made to connect with patients and the required notification can be applied and treatment can be given by the doctors accordingly.
Index Terms— IoT, Sensors.

INTRODUCTION

IoT is the fast and vast evolving technology in today's world. IoT in health application has numerous growth. As recent problem has been developed with healthcare, IoT is the most adaptable technology used. Most common method used in IoT technology is notification method. IoT can be made connected with various sensors. Sensors can be connected with people facing health issues. Basic sensors in health field includes pressure sensor, airflow sensor, temperature sensor, oxygen sensor etc. High level sensor in healthcare include biosensor, flow sensor, image sensor etc. People faces numerous health problem in today's lifestyle. Various problem is faced by people through both external and through internal body system. External problem in health issue include skin damage, problem in facial and hair etc. Problem in healthcare can be made connected to sensor. Various sensors need to be properly assigned with health issue and notification need to be made given to doctors. Proper notification to the doctors will be useful for giving treatment to the required patients. Recently faced major issue in covid can also be tried with various sensors. In covid, sensors can be made attached with several values which controls the spread of disease. During initial level, sensors in major disease like covid are not used. Whereas, now sensors are used. Likewise, sensors can be made used in several health issues like internal problem which include lung, heart, neural problem etc. Nowadays, major problem is happening due to poor treatment or delay in treatment. Proper follow up need to be given to doctors through sensor notification. The method of notification regarding patients issue can be given to doctors. Doctors can also be made with proper monitoring of patient's data. This monitoring can reduce unnecessary meeting of patients to the doctors for small health issues. Advancement in technology can also reduce spread of disease which will be helpful to lead healthy society. Using of sensors and in medical field helps in development in technology. Minimization of patients in hospital will reduce spread of diseases among common public and also minimizes the work of doctors. Through sensor based system, proper data about the patients can also be maintained. Using of sensors, will also helps in improvement of digitalization. Other than monitoring health of patients health, IoT can also be used in various areas at hospitals. Sensors can be attached with medical equipments. Medical equipments can also include wheelchairs, oxygen pumps and other monitoring equipment etc.

FACTORS AFFECTING IOT HEALTHCARE APPLICATION:

There are various factors which affects IoT in healthcare such as information in database. improper communication between doctor and patients.

II.METHODOLOGY:

A. DATA ACQUISITION: Various medical data need to be collected from hospital. The data includes patients medical history such as disease, medicines related to the disease etc.

B. PREPROCESSING: The data's of patients need to be collected by the hospital. The collective data will be helpful to maintain patients record. The record collected from the patients need to be properly updated by the doctor regularly during regular check up of patients. In case of any health issues happened to patients, proper treatment need to be given by the doctor and immediately need to be updated in database.

C.DATA SEGMENTATION: The data's about the patients need to be collected and need to be properly classified based on patients disease. Segmented data will be properly updated based on continuous check up done by the doctors.

CLASSIFICATION OF DISEASE: The patients disease need to be classified and it will be updated in database. The update of disease and medicines need to be followed in database. The database will also be combined with doctor and patients mobile phone

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III. PROPOSED SYSTEM:

IoT combined with artificial intelligence can be done with hospital database. Due to increase in spread of various disease, technology is involved to avoid the spread of disease. The experimental idea with hospital management has started from the period of COVID. Spread of disease among common public need to be reduced and avoided. Periodic visit of patients can be avoided for small diseases. First the patients data will be collected from the doctor and it need to be maintained in the database. Various sensors are connected with patients data and the database is connected with doctors mobile phone. For small problems, the patients can contact with the doctor through online application. The application is developed with database. After the completion of consultation from the doctors, the medicines updated to the patients need to be modified in the database. The data's updated will be automatically send to the patients also through notification. The continuous notification of data's to the patients will helps in proper maintenance of database. Several basic sensors are used in this paper. Medical sensors include pressure sensors, airflow sensor, temperature probe etc. IoT is the technology which is easily accessible for people.

Software is updated with hardware sensors and update of database is notified to the patients through IoT technology. Various basic sensors are discussed as follows.

PRESSURE SENSOR: Pressure sensor helps to measure flow of oxygen in the body. Medical pressure sensor is found to be one of the important sensor in medical field as it is associated with respiration and oxygen level in the human body.
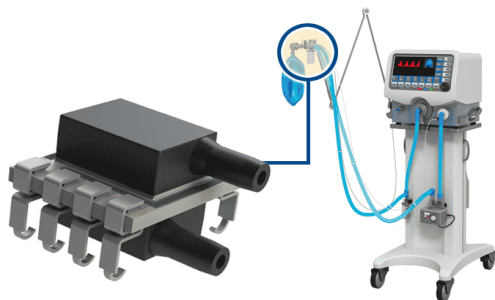

Fig. 1.Pressure Sensor..

AIRFLOW SENSOR: Airflow sensor in medical field helps to measure the flow of air ventilation and air conditioning.

Fig. 2. Airflow Sensor.

TEMPERATURE PROBE: Temperature probe is nothing but temperature sensor, which is used to find the level of temperature in human body. Maintaining temperature in patients body under normal condition is critical and it can be maintained by checking using temperature sensor.

Fig. 3. Temperature Probe.

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IV. METHODOLOGY:

 Medical system is found to be growing nowadays and it can be made to improve further with the help of IoT technology. IoT in medical field can be improved by the use of above mentioned sensors. Patients data is collected from the doctors. Then, the data's are maintained in a database by the hospital. Each patients can be given by the unique patient ID by the hospital and the unique ID can be shared with the doctors. The unique ID will helps the doctors to easily maintain the patients details and update in patients record can be easily done by the doctors. Patients mobile phone and doctors mobile phone need to be connected through mobile application. Sensors can also be connected with patients if there is any problem. If there is any variation in patients body, the sensor will automatically send notification to the doctors. The doctors mobile can be given with alarm in the particular patients unique ID and the doctors can give the suggestion to the patients through mobile phone itself. This method can be useful for small devices and it will be useful for patients in unwanted visit to hospital. Notification process to both doctors and patients need to be properly done as the same ID will be maintained for further updates. Due to various updates in medical field, spread of disease can be reduced. Notification made through mobile phone plays a very important role and it can also be maintained in the government database also to know about the persons details in case of emergency. IoT technology connected with notification is found to be easy for patients to communicate with doctors.

V. ADVANTAGES AND DISADVANTAGES OF SENSORS IN HEALTH CARE SYSTEM:

There are several advantages and disadvantages in healthcare management. Advantages include proper monitoring of patients data and maintaining it, Prevention of patients health before leading to next stage in future by observation. Reduces travelling time for patients for some small problems. There are several improvement in healthcare and treatment process also. As IoT technology is helpful in collecting large values of data, they have high value for health care research process.

VI. CONCLUSION AND FUTURE WORK:

Healthcare is developed with sensor and IoT methods, which is useful through mobile notification, several advantage can be done with artificial intelligence. In future, it can be done with large database as cloud with advancement in several technologies.

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