



DESIGN THINKING BASED PATIENT HEALTH MONITORING AND INITIAL DIAGNOSIS BY A REGULAR CONSULTANT USING ARTIFICIAL INTELLIGENCE AND INTERNET OF THINGS

S. Gopalakrishnan¹, S. Dharshan², E. Dhanush kumar³, R. Mohan⁴

Assistant Professor, Department of Information Technology, SNS College of Technology, Coimbatore, TamilNadu¹

UG Scholar, Department of Information Technology, SNS College of Technology, Coimbatore, TamilNadu²

UG scholar, Department of Information Technology, SNS College of Technology, Coimbatore, TamilNadu³

UG Scholar, Department of Information Technology, SNS College of Technology, Coimbatore, TamilNadu⁴

Abstract: Internet of Things (IoT) and Artificial intelligence (AI) are two of the fastest growing technologies in the world. As more and more people move to cities, the concept of a smart city is not foreign. The idea of a smart city is based on transforming healthcare by increasing efficiency, reducing costs, and putting the focus back on better patient care. Implementing IoT and AI for remote healthcare monitoring (RHM) systems requires a deep understanding of the various frameworks in smart cities. These frameworks come in the form of underlying technologies, devices, systems, models, designs, use cases, and applications.

The IoT-based RHM system mainly uses AI and machine learning (ML) by collecting various datasets and data. On the other hand, the methods of ML are widely used to create analytical representations and integrated into clinical decision support systems and various forms of healthcare services. After careful consideration of each factor in clinical decision support systems, individualized treatment, lifestyle counselling advice, and care strategy are suggested to patients.

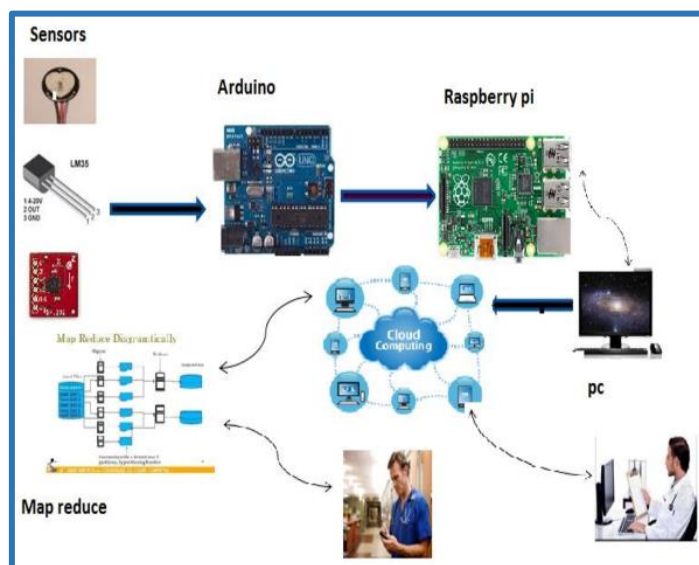
The technology used helps support health applications and analysis of activities, body temperature, heart rate, blood glucose, etc. With this background, this paper provides an overview that focuses on identifying the most relevant health applications in the Internet of Things (H-IoT) supported.

Keywords: Design Thinking, Internet of Things (IoT) and Artificial intelligence (AI)

I. INTRODUCTION

“Patient Health monitoring and initial diagnosis by a regular consultant using Artificial Intelligence and Internet of Things” is used to monitor the health of a patient by their loved ones and their doctor regularly when the patient is at remote. Health monitoring is done by a sensor device which is developed with IoT enabled devices Like smartwatch and chain locket, this will send the health status of a patient to the mobile phone of their loved ones and Family doctor. The basic information of the patient’s health status like Blood pressure, ECG, Pulse rate, Breathing Conditions to the Doctor.

This information will help the doctor to suggest initial diagnosis and first aid to the patient when they are at the remote. The AI identify the critical position of the patient 20 minutes in advance and make enabling the IoT enabled device of a patient to send notifications to the doctor and their loved ones.



II. LITERATURE SURVEY

There are some applications to detect the health conditions of the patient at their remote access, how my research is differentiated to implement my innovations. There are some mobile applications and medical devices to monitor the status of a patient when they are remote from their loved ones and family doctor. But there is no implementation of IoT Enabled devices and The Technology of Artificial Intelligence (AI) for the early detection of health condition and sending notification to their doctor.

III. LIMITATIONS

- Mobile applications are unable to install with ordinary mobiles phones.
- Mobile phones are not directly connected with the body of a human.
- Mobile signals may not cover in all the areas.
- There is a possibility of breaking the access because of low battery.
- Mobile applications are more expensive than sensors.

IV. PROPOSED WORK

In my Research a program of Artificial intelligence and IoT Sensors will fix with the devices like smart watch or chain locket, which are always directly connected with human body so it will help to detect the BP, ECG and pulse rate accurately. And the Artificial Intelligence (AI) will support to identify the health condition of a person 20 mints in advance, it will help the doctor to give suggestion for precaution medication at the earliest.

ADVANTAGES

- Easy Access
- No need to Carry the device Separately
- Doctors can get accurate measures about basic health information
- Time consumption for investigation is less
- Less Implementation Cost

V. METHEDODOLOGY

- Develop a coding related to the project
- Compile the program code
- Upload the code (in Arduino)
- Connect the sensors
- Fix the device in patient's body
- Connect the device to a battery (for power)



TECHNOLOGICAL INFLUENCE

Technical requirements are the technical issues that must be considered to successfully complete a project. These can include aspects such as performance, reliability and availability.

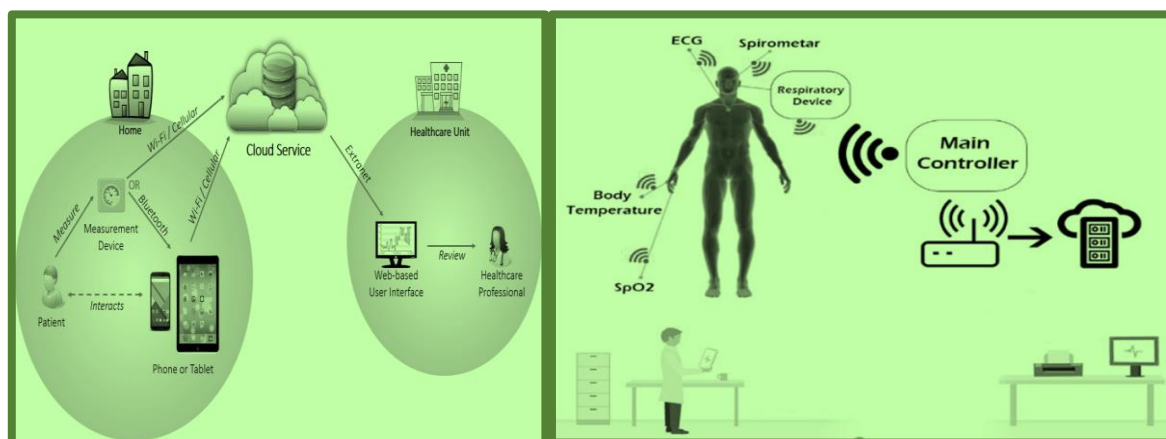
INFLUENCE OF ARTIFICIAL INTELLIGENCE (AI)

Artificial intelligence (AI) is the ability of a computer or a robot controlled by a computer to do tasks that are usually done by humans because they require human intelligence and discernment. In my Research the Artificial intelligence playing a role in our device to measure the body condition of the patient, if any changes in the range of prescribed level of Blood pressure, Heart Rate, Pulse Rate and Breathing condition it will identified 20 mins before and send notification to the family doctor and their loves ones.

INFLUENCE OF INTERNET OF THINGS (IoT)

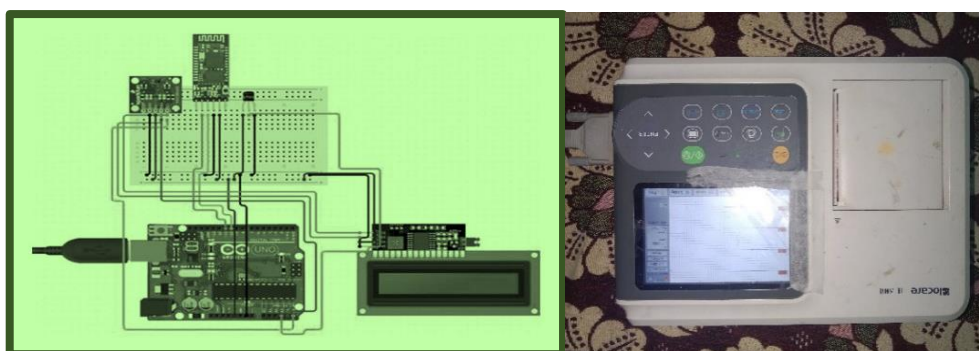
Internet of things (IoT) describes the network of physical objects “things” That are embedded with sensors, software and other technologies for the purpose of connecting and exchanging data with other devices and systems over the internet. In my Research the Internet of Things playing a roll of measuring a exact status of BP, ECG, and Breathing condition of a patient and create network connectivity between the IoT Enabled Device of a Patient and Mobile phone of Family Doctor and The family members and send notifications about the status of patient.

IoT and AI ENABLED HEALTH MONITORING SYSTEM



DATA COLLECTION AND ANALYSIS

The data for this research work is basically from hospitals, the normal range of Blood pressure, ECG, Temperature and Heart rate of a human is collected from general consultants. The Data evaluation method is observed from laboratories how the analysis is done by a medical persons and the status of a patient is identified and generating reports. To inspecting about the body condition of the patient what are the medical equipment's are used by the medical industry and how it will be generating the report as normal or abnormal in range. IoT Sensor is used to send the notification to the devices which are connected with patients IoT Enabled devices. For Initiating this Data Communication Process, the IP Address of the Destination devices to deliver the notifications at the right time and to the right person.





With the help of above data collection and idea about the functions of medical instruments we have developed IoT Enabled devices with the frequency and Intelligent quotient of Artificial Intelligence sending notifications to the connected devices about the status of the patient’s health.

IoT ENABLED CHAIN LOCKETS

IoT ENABLED SMARTWATCH



IMPLEMENTATION WITH ARTIFICIAL INTELLIGENCE (AI)

VI. CONCLUSION

DESIGN THINKING BASED PATIENT HEALTH MONITORING AND INITIAL DIAGNOSIS BY A REGULAR CONSULTANT UNING ARTIFICIAL INTELLIGENCE AND INTERNET OF THINGS” is developed exclusively for the patients when they are present at the remote from their loved ones and family doctor to monitor their health condition by them. We have researched about the systems which are available for detecting the health status of a patient by their own, systems with IoT sensors are used to identify and send notifications to the connected devices but there is no AI influenced system for its early detection. We have developed the systems for detecting the health condition 20 mins in advance through AI and send notification to the doctor with accurate health report like BP, ECG, Pulse rate, Heartbeat, Temperature etc...Through this system doctors can easily identify the basic idea about the patient health condition and suggest for the diagnosis quickly.