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iMedBox – HIS

An intelligent home-based platform, the iHome Health-IoT, is proposed and implemented i.e., intelligent medicine box

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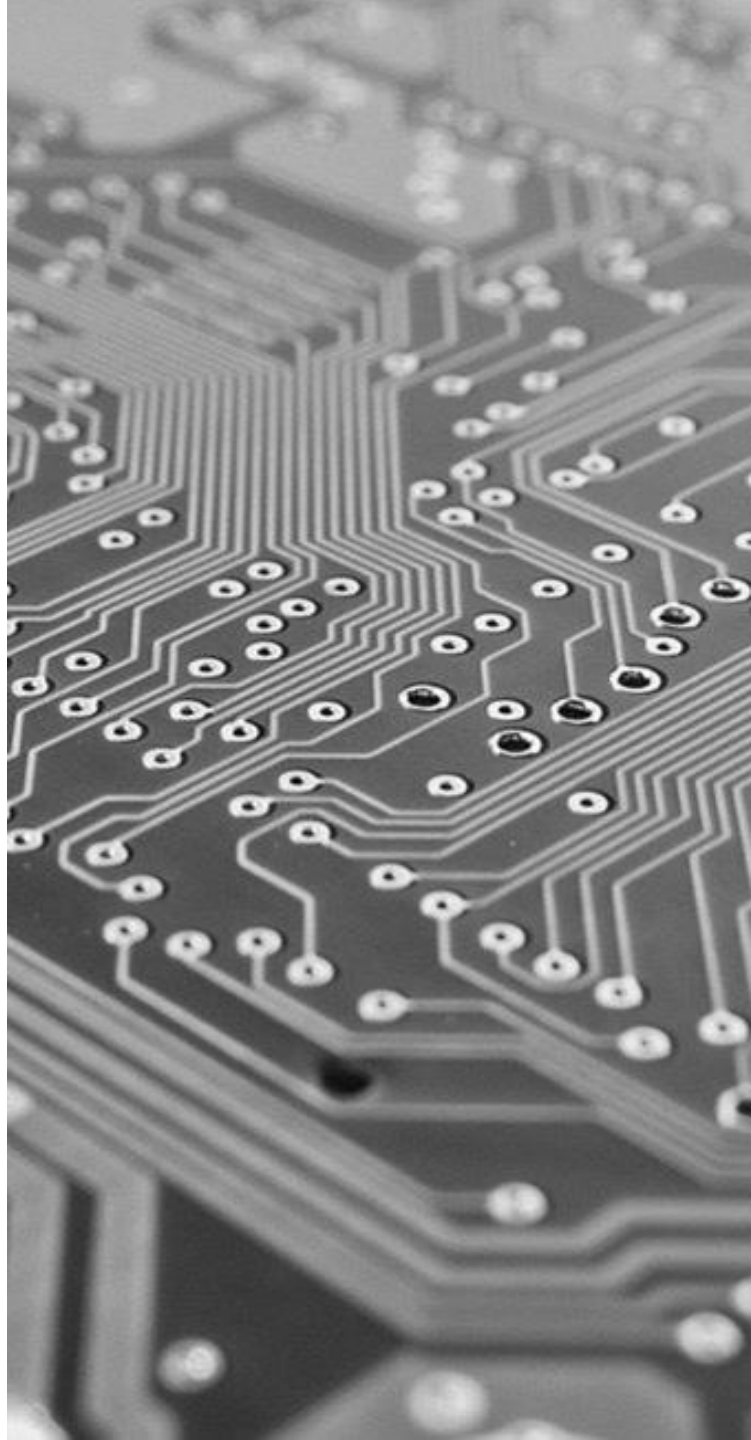
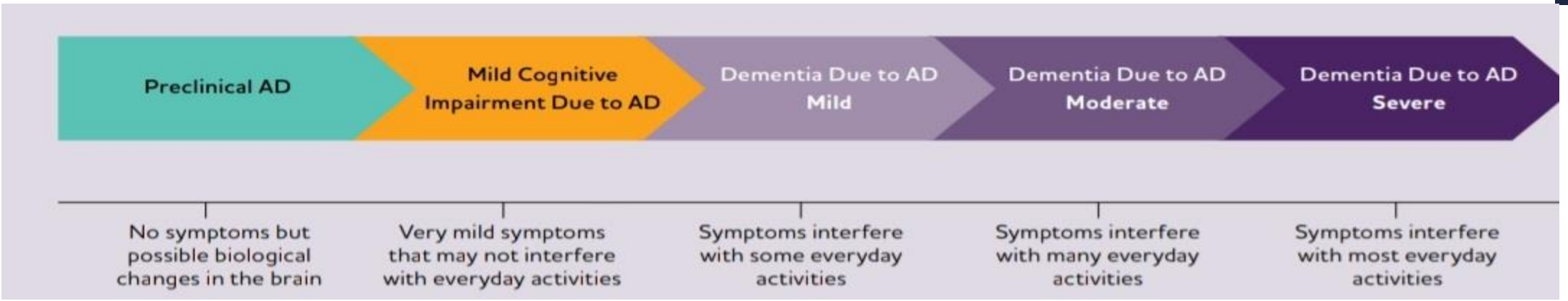
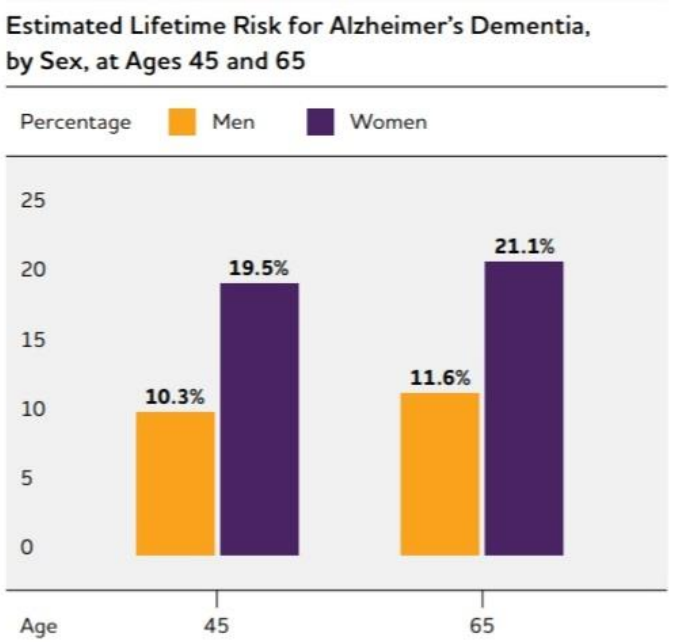


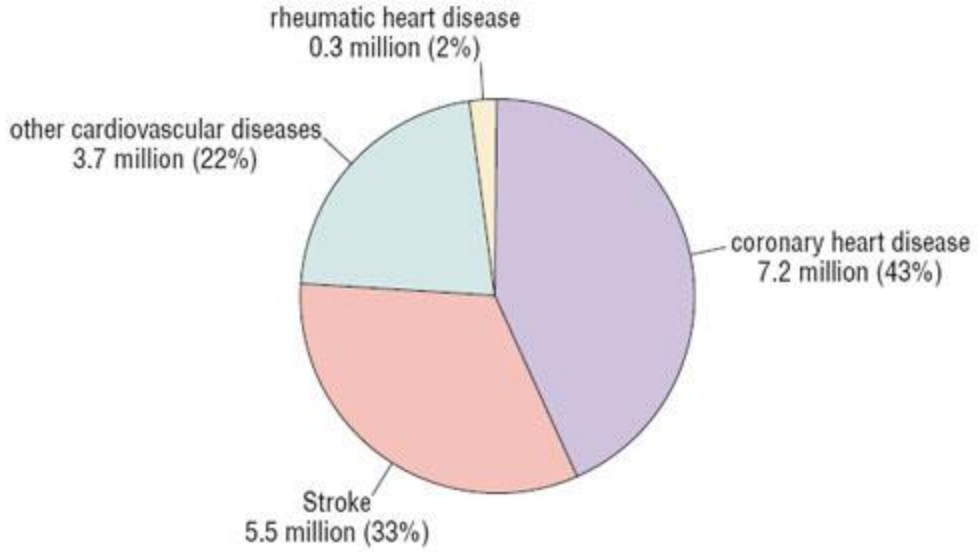
OBJECTIVE

- An intelligent home-based platform, the iHome Health-IoT, is proposed and implemented
- The platform involves an open-platform-based intelligent medicine box (iMedBox) with enhanced connectivity and interchangeability for the integration of devices and services
- The proposed platform seamlessly fuses IoT devices (e.g., wearable sensors and intelligent medicine packages) with in-home healthcare services for an improved user experience and service efficiency.
- iMedBox serves as a home healthcare station providing strong interoperability and IoT network connectivity

Alzheimer's and Cardiovascular diseases







- Alzheimer’s disease is a type of brain disease, just as coronary artery disease is a type of heart disease. It is caused by damage to nerve cells (neurons) in the brain.

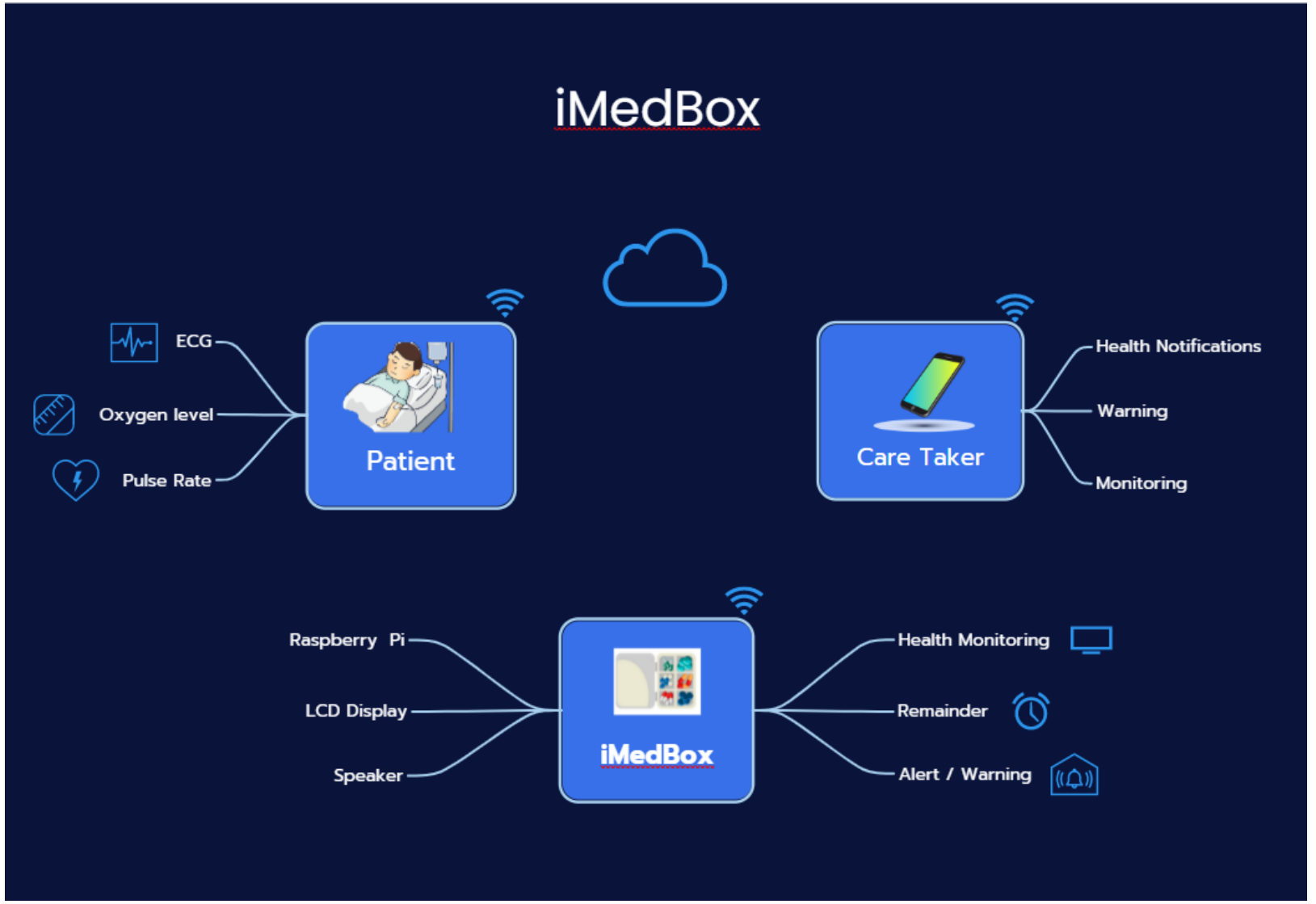
- As a result, the first symptom of Alzheimer’s disease tend to be loss of memory which is increasingly seen among middle aged people due to work stress.

- Cardiovascular diseases (CVDs) are the leading cause of death globally.

- An estimated 17.9 million people died from CVDs in 2019, representing 32% of all global deaths. Of these deaths, 85% were due to heart attack and stroke.

- It is important to detect cardiovascular disease as early as possible.

Proposed Block diagram

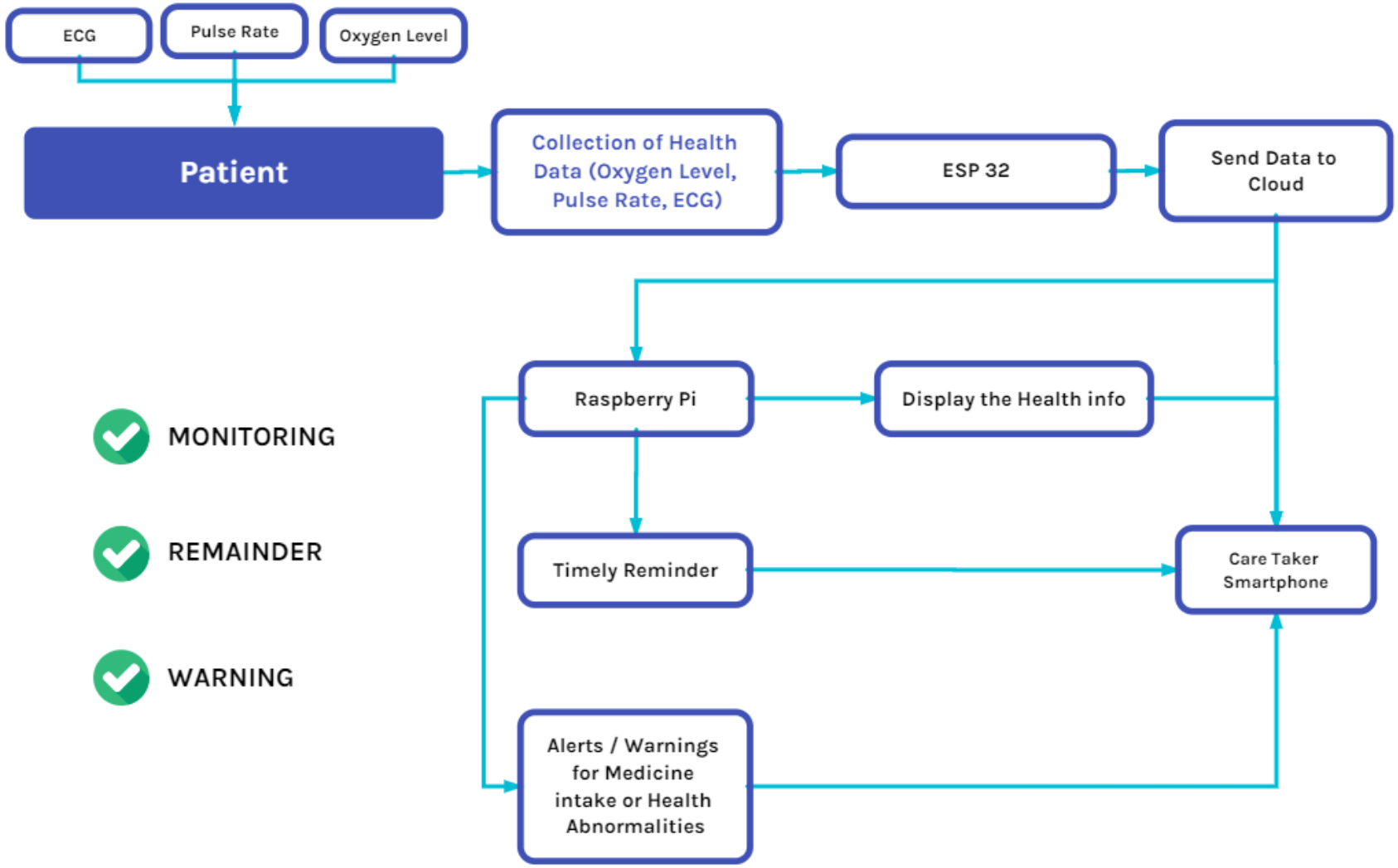


Flowchart of Proposed Work

MONITORING

REMAINDER

WARNING



Algorithm of Proposed Work

- Collection of data through bio sensors like
  1. AD8232-ECG
  2. MAX30102 – Oximeter and Pulse Rate

  ESP8266/ESP32 are used to collect the Health information from the Patient

- The collected data are sent to the Cloud storage and visualize through ThingSpeak or Ubidots and also communicate with the ESP32 through MQTT using Wi-Fi

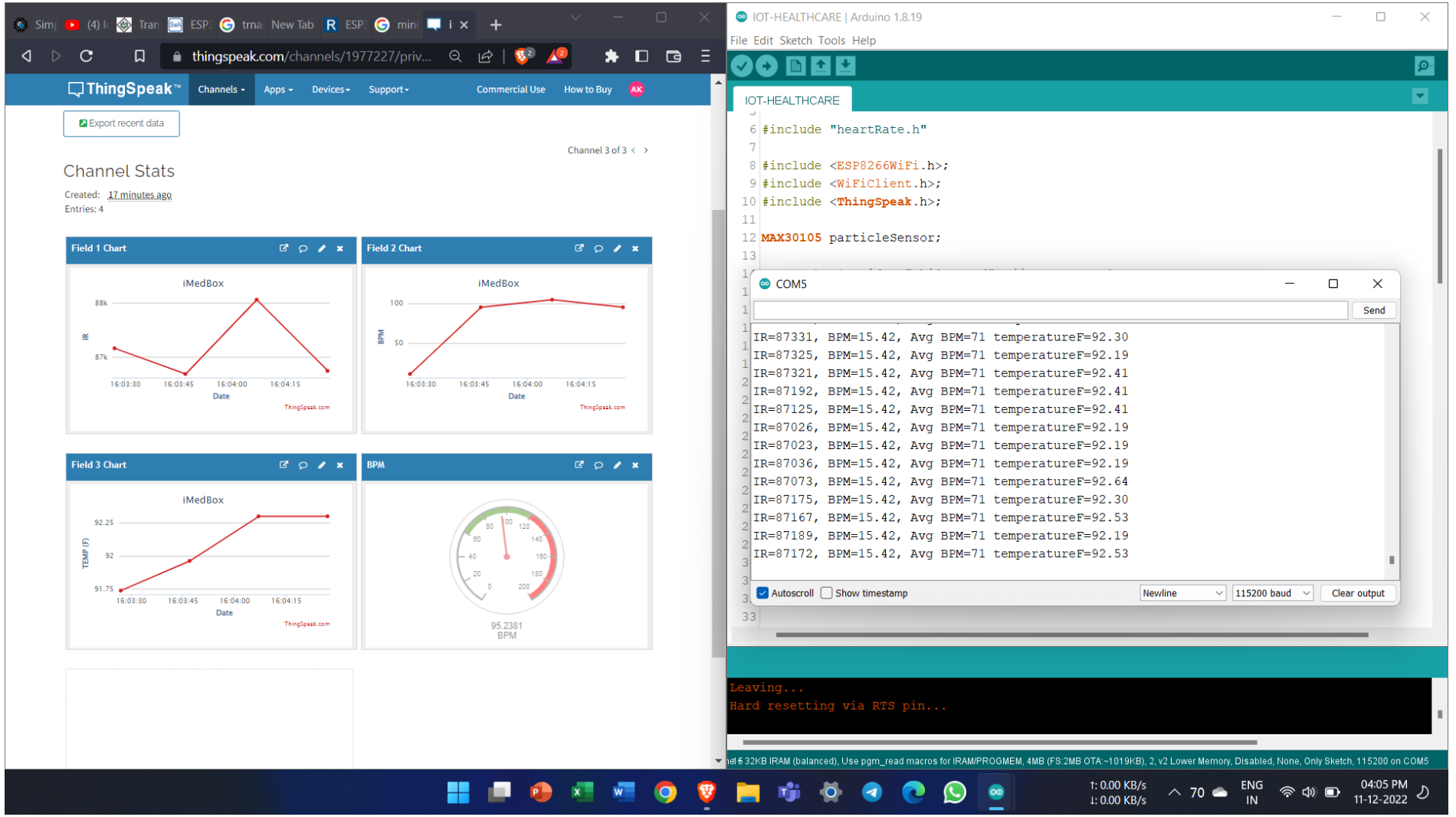
- Vital health information are also displayed on the iMedBox and care taker using Display for continuous monitoring of patient health

- If any abnormalities are found, warning is immediately sent the care taker

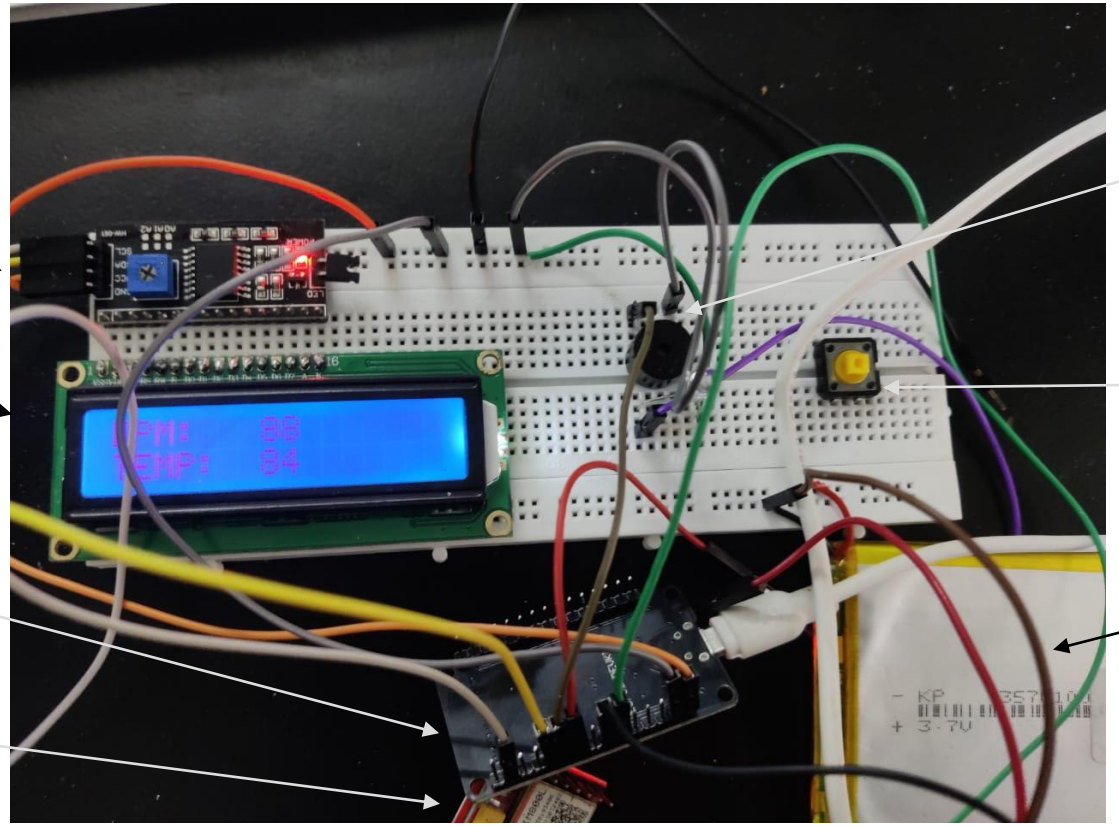
- Timely remainder for the patients to ensure continuous intake of medicine using audio remainders (speaker)/ Buzzer

- Irregular intake of medicine is monitored and warned

Screenshot of Simulation Model



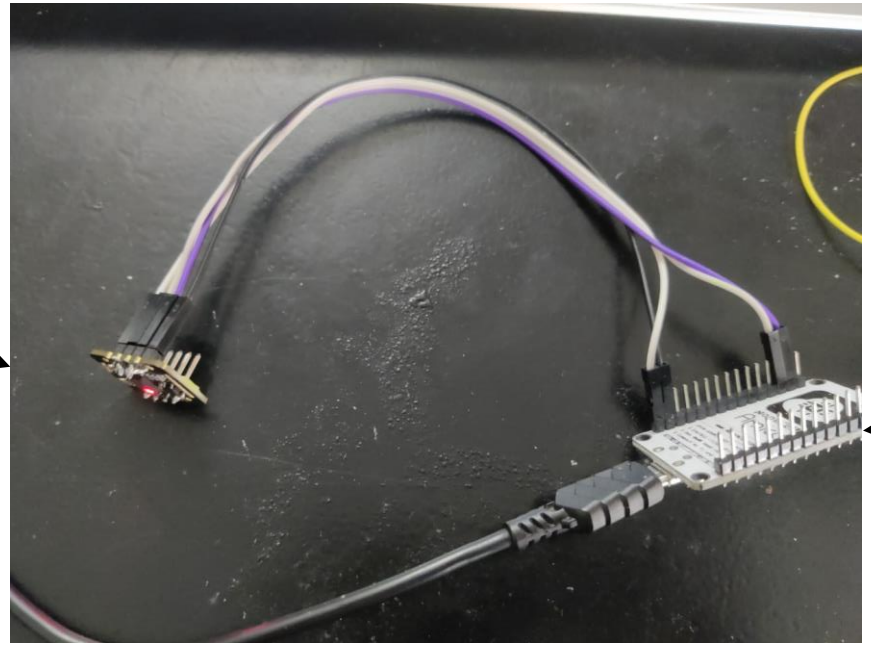
Hardware module



iMedBox Module

Hardware module

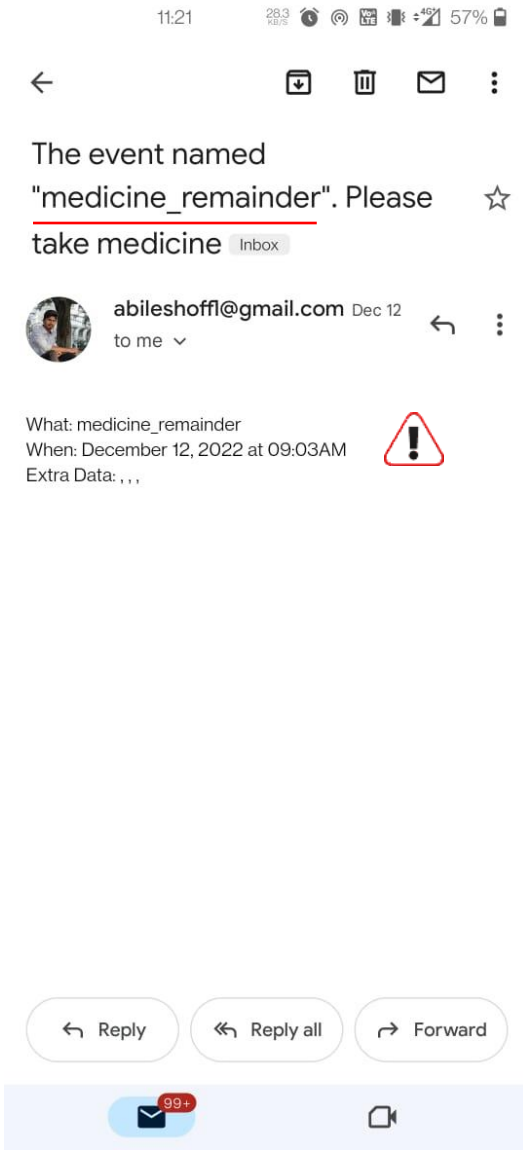
MAX30102

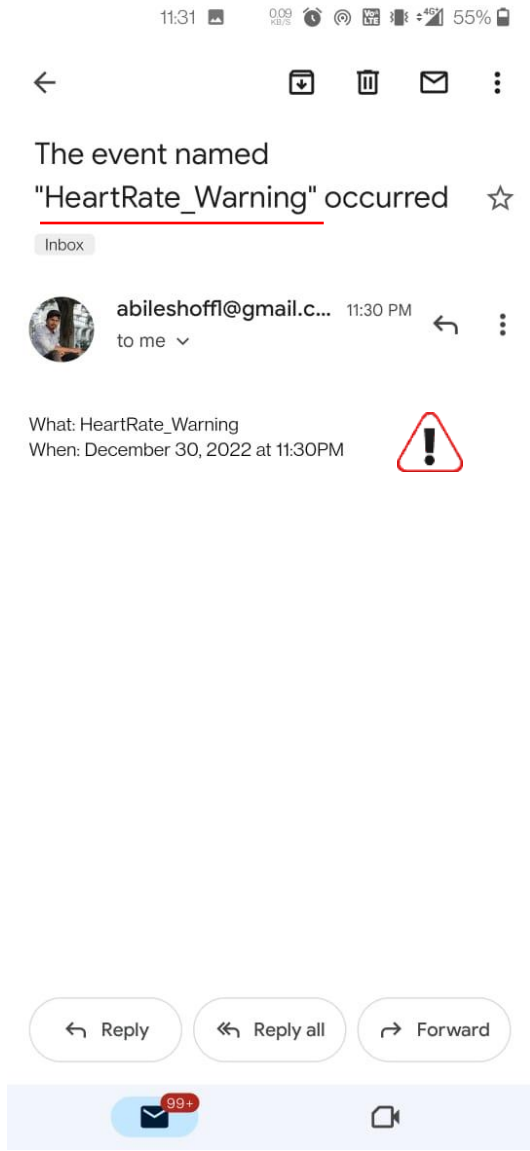


ESP8266

Module to be fitted on to the patient

Output Screenshot





Conclusion

- This iMedbox will create a great impact among
- Elderly patients who is suffering from various diseases including Alzheimer’s disease.
- People who ignores regular check ups and for those who forget to intake medicine due to their stressful work life.
- Caregivers who are unable to take care of their own activities while taking of the patients and reduce their emotional stress.

iMedbox

- Trend in healthcare is to move routine medical checks and other healthcare services from Hospital-Centric to the Home-Centric.
- Real-time monitoring and analyzing vital signs to early-detect or predict life-threatening adverse events.
- Checking whether they are following their prescribed treatment, including taking their prescribed medicine on time.

References

- *https://ieeexplore.ieee.org/document/8554425*
- *https://ieeexplore.ieee.org/document/9675896*
- *https://ieeexplore.ieee.org/document/6747344/*

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