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AI and IOT Integrated Ambulance System

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Abstract: ***In our daily life we see so many situations where patients face many difficulties failing to find the hospital required for their needs. There are many situations where the patients are dead after going to the hospital because of unavailability of beds, surgeons and oxygen cylinders. Even if they find a hospital having these needs the distance would be more which in turn result in the death of the patient. To avoid this situation, we have developed a system where patients can have the information of the hospitals like number of beds available, oxygen cylinders and distance from ambulance to hospital. The system will collect the vital parameters of the patient, helps to check the criticality of the patient and chooses a hospital.***
Keywords: Artificial Intelligence (AI), Internet of Things (IoT), Esp 32.

I. INTRODUCTION

Almost all hospitals were completely filled during covid times and there were no sufficient beds, oxygen cylinders and the even though there were many surgeons it was difficult because the number of patients have increased gradually. If the patients know the information about the number of beds available, oxygen cylinders and distance from ambulance to the hospital about a particular hospital it would be very easy and reduces the number of deaths.

To avoid this situation we have developed a system where we have used Artificial Intelligence(AI) and Internet of Things(IoT) to provide a solution. AI is used to tell about the critical condition of the patient and IoT is used to collect the vital parameters of the patient using sensors like heartbeat sensor and DHT 11 sensor(gives temperature and humidity data). The sensor is displayed on the LCD screen which is connected to the ESP 32. The data collected from the sensors is used by AI to tell the condition of the patient and uses it to give an output about the hospital. The hospital information is stored in the cloud where entire details of the hospitals have been stored. AI will choose a hospital according to the needs of the patient and gives a final output on the LCD displa

II. FIGURES AND BLOCK DIAGRAM

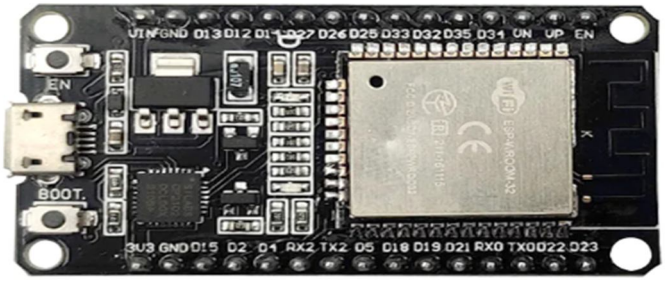


Figure 1. ESP 32

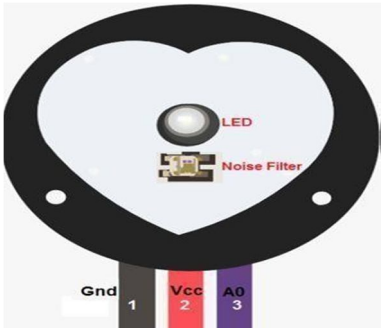


Fig 2. Heartbeat Sensor

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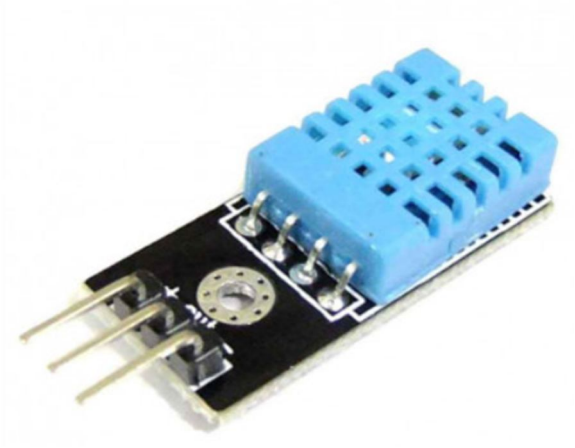


Figure 3. DHT-11Temperature and Humidity Sensor



Figure 4. LCD Display

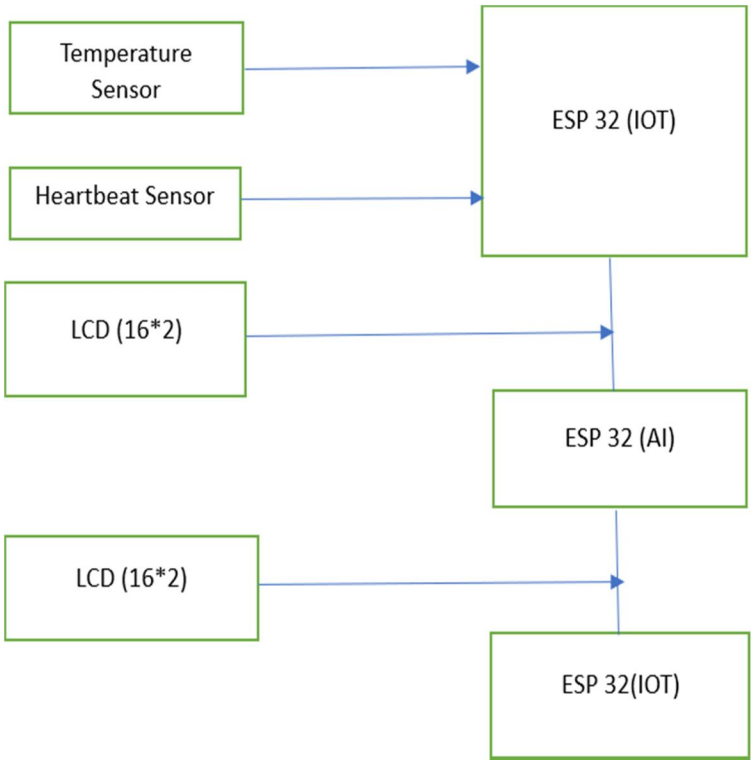


Figure 5. BLOCK DIAGRAM

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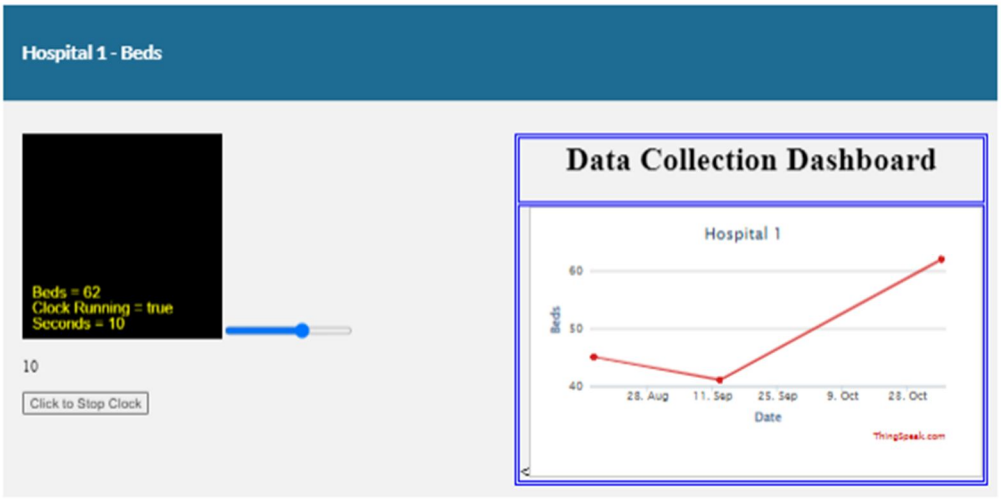


Figure 6. Hospital information

III. PROPOSED WORK

The proposed system uses Artificial Intelligence(AI) and Internet of Things(IOT) which are two useful technologies for various industries and for our daily activities. AI is used in each and every aspect of our daily life in order to make things work smoothly. AI is mainly focused on creating and implementing new machines, these machines are designed in such a way that they perform tasks which requires human intelligence, problem solving skills and decision-making skills. AI applications have a major impact in fields like finance, healthcare, transportation, finance and entertainment. Whereas IoT is a concept which helps our devices connect to the internet and allows the collection and transmission of data. Some of the important components in IoT are sensors, which are also important in our project. IoT depends on sensors such as heartbeat, temperature and humidity to collect the data. IoT have multiple applications from smart homes to healthcare and industries.

This system involves components like sensors(heartbeat sensor, temperature and humidity sensor), lcd display, ESP 32, bread board and connecting wires. Initially the three ESP 32's are arranged on the bread board and connecting wires are used to establish connection between the three ESP 32's so that data can be transferred from one ESP 32 to the other ESP 32. The first ESP 32 is connected to a heartbeat and DHT 11 sensors. Heartbeat data can be collected by placing a finger on the sensor. Code required for this is dumped in the ESP 32 by uploading it from Arduino. The data is sent to the ESP 32 and then to display the data an LCD display is used which is interfaced between two ESP 32's. In the LCD display the temperature and heartbeat values are displayed which can be used to tell the criticality of the patient. The first ESP 32 is interfaced with the second ESP 32 so that sensor data is transferred to the second ESP 32 which uses AI. AI is trained in such a way that it tells whether the patient condition is critical or not.

Based on the criticality AI will choose a hospital from the cloud, this will be done by interfacing the second and third ESP 32's.

Cloud consists of information of the hospitals like:

1) Number of beds
2) Oxygen cylinders
3) Number of surgeons
4) Distance from ambulance to hospital
5) Number of ICU beds

This information is updated daily so that the when a patient is in a need it will be easy to know about the hospital information. AI chooses the hospital in such a way that, if the patient has low oxygen levels and need an oxygen cylinder immediately, AI gives priority to the hospital which is having more oxygen cylinders and also considers the distance between the ambulance to the hospital. After choosing a required hospital from the list of hospitals available it has to be displayed on the screen and this can be done by interfacing the second and third ESP 32's which are connected to a LCD display. The LCD display shows whether the patient condition is critical or not in the first line and the hospital on the second line. This is how the system works and is used to minimize the number of deaths.

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IV. RESULTS

In this project one can observe results when the finger is placed on the sensors and take the vital parameters of the patient, it displays the values of the sensors in the 1st LCD display and in the 2nd LCD, it displays the patient condition which has been analysed by the parameters taken by the sensors and the hospital which has to be choosen for particular requirements of the patient.

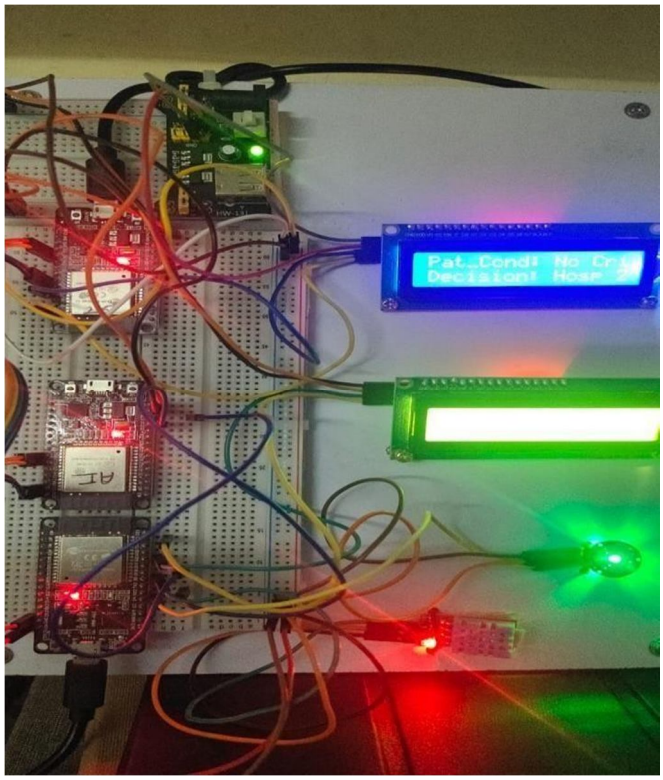


Figure 7. Represents output messages on LCD's

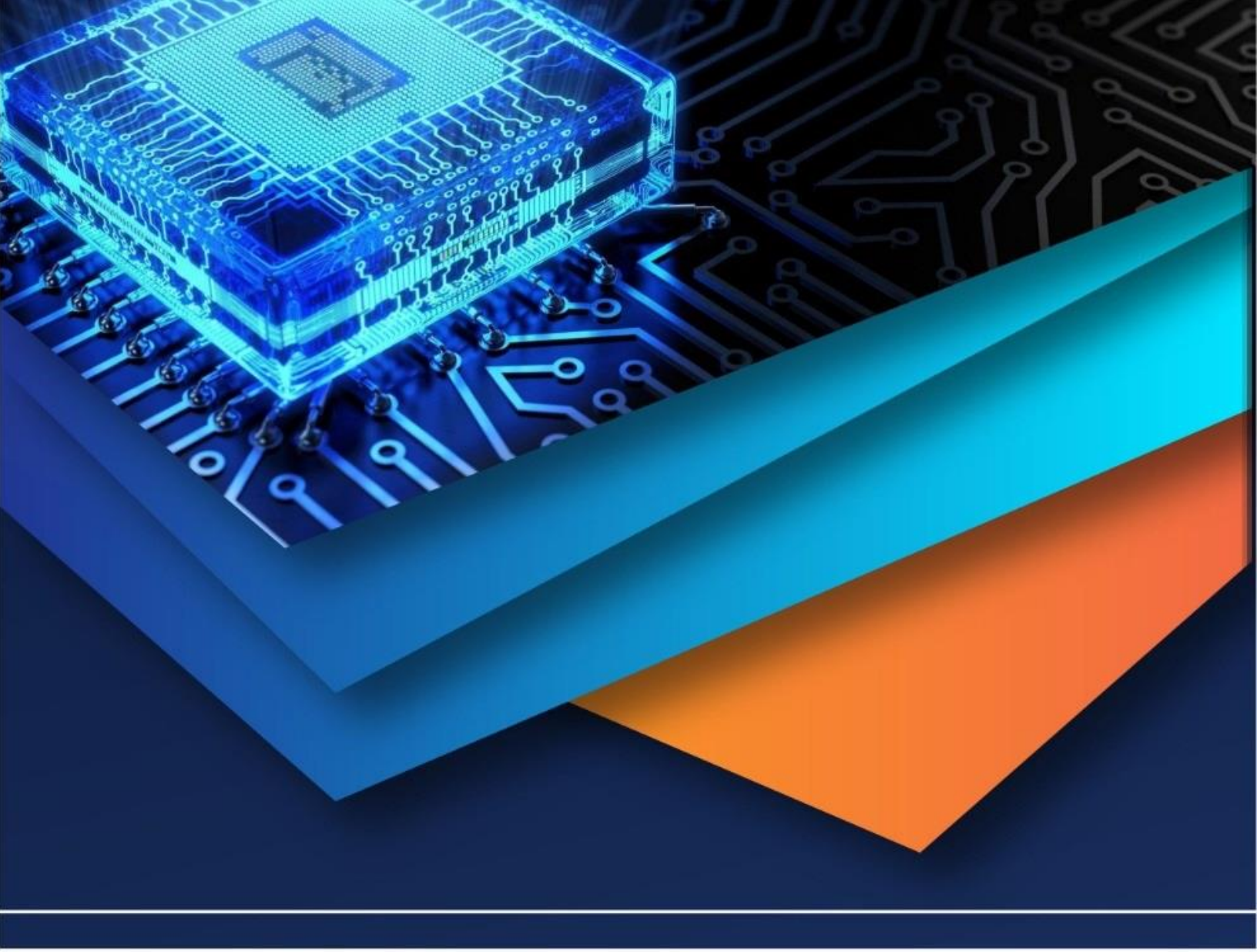
V. CONCLUSION

In this project, the condition of the patient will be analyzed with the help of Artificial Intelligence. Selection of thehospital according to the patient's condition with the hospital web page server. Hospital decisions will be made by the Artificial Intelligence-based system by fetching the details from the centralized server page connecting to all hospitals nearby. The Artificial Intelligence-based hardware system will take the biomedical parameters of the Patient such as the Heartbeat, humidity, and body temperatureand it will analyze and decide what the patient needs like oxygen cylinders, bed support, ICU support, and surgeons by checking with the networked medical system availability hospital using IoT. By the AI categorization of medical sensor values, the patient can be categorized in suitable support. The details of the hospitals with available facilities and the condition of the patient will be posted on the website. According to the patient's criticality, it suggests which hospital to go for the better treatment of the patient.With this project there is real time patient monitoring, improved decision support, enhanced resource allocation and faster response.

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