SSBS: IOT-ENABLED EMERGENCY ALERT SYSTEM ENHANCING SAFETY FOR ELDERLY, PERSONS WITH DISABILITIES, AND PREGNANT WOMEN

A Thesis Presented to the Faculty
of the College of Science
Technological University of the Philippines
Manila

by

Ethel A. Cacayan
Shayna Lorraine R. Laureta
Michael Angelo P. Par
Daniel I. Perez

In Partial Fulfillment of the Requirements for the Degree
Bachelor of Science in Information Technology

June 2024

INTRODUCTION

The "SSBS: IoT-Enabled Emergency Alert System Enhancing Safety for Elderly, Persons with Disabilities, and Pregnant Women" uses GPS and GSM to track vital signs and real-time location. This study aimed to create an affordable and easy-to-use wearable device that will ease the difficulties of monitoring the Elderly. The system uses IoT technology to track the real- time location and physiological viewpoints of the elderly, enabling regular monitoring for caregivers and guardians. The system tracks the real-time location of the user through geolocation using the A9G GPS and GSM Module. The readings of vital signs will be displayed in the IoT platform of the guardian/caregiver. The device also uses 18650 Battery as its power source, despite ensuring that the device is energy-efficient. The battery has a high capacity for longer use the prototype lacks alert when the battery is running low. The system will be used for both outdoors and indoors. 6 SSBS: IOT-ENABLED EMERGENCY ALERT SYSTEM (2022) uses the Geolocation API to monitor users, including kids, travel agencies, and online e-commerce. Send an alert SMS and notification to its guardian when sensors detect heart rate, body temperature, and other abnormalities. It dramatically impacts people?s well-being and quality of life while at the same time giving convenience. It is ideal to use outdoors with a strong data connection and open area.

METHOD

The results of the test were documented. The device will read the user?s body temperature and show the heart rate. The system will display the real-time location of the user in the IoT platform. The user???Location is 20 or viewpoints40 meters away from the guardian/caregiver. The guardian/ caregiver must receive an alert notification if the user is more than 40 meters away. The project?'s acceptability was assessed using the TUP evaluation instrument. The SSBS uses a GPS and GSM module to track the movements of the user in real time. The GPS coordinates (latitude and longitude) will be sent to NodeMCU ESP32 to the IoT platform and displayed and monitored by the caregiver/guardians in their phones or computers. Data gathered from the Heart Rate Sensor and LM35 Sensor for body temperature is shown on the IoT dashboard. The location of theuser will be shown/seen on the Internet of Things (IoT) and the guardian will receive a notification alert that contains a warning message. The SSBS?s IoT-Enabled Emergency Alert System can provide real-time health and location data. The system can provide alerts to guardians, caregivers or relevant parties in situations where the user's well-being is at risk. If the heart rate goes above 150 beats per minute, a high heart rate alert is sent to the caregiver/guardian through SMS. By combining these elements, the system can providing real- time health andLocation data, allowing for prompt emergency response and alerts. 49 SSBS: IOT-ENABLED EMERGENCY ALERT SYSTEM. Created a program using the HTML, CSS, and JavaScript programming language. Assembled the hardware components. Developed a system?s flow algorithm for the Emergency Alert System. Following that, the system will proceed to process X. The system will then send an alert to the user. The alert will then be sent to the recipient. The user will then receive an alert back to the server. The result will be an alert that the user has received an alert.

RESULTS

The user?s body temperature was visible on a dashboard for easy monitoring. The caregiver's/guardian's heart rate was displayed on the dashboard. Alerts were sent to the user and the caregiver via a text message. The user's location was monitored by a GPS system. The device was connected to the internet and monitored via a web browser. It was powered by an Arduino microcontrollers. The system was able to send an alert to the caregIVER if the user's body temperature, heart rate, and location were all below a certain threshold. The system developed was evaluated by 35 respondents including IT Professionals, Pregnant women, Persons with Disabilities, Guardians/Caregivers, and Healthcare sectors. The accuracy and functionality of test results for the developed system are avering. The system developed can only read and monitor the Body Temperature, and HeartRate of the user. It can only send an alert when the user?s location exceeds 20 meters and 40 meters away from the caregiver/guardian. The SSBS is a wearable device that monitors the vital signs of the user. It is designed to help elderly individuals, pregnant women, and persons with disabilities. The researchers used a flowchart to explain and illustrate the system. They also created a block diagram for the study that illustrates the construction of the device. The system can locate the real-time location of theuser. It can support multiple devices in monitoring the vital Signs of the User. It has a built-in temperature sensor. SSBS: Iot-Enabled Emergency Alert System Enhancing Safety for Elderly, Pregnant Women, And Persons With Disabilities. System combines health monitoring for body temperature and heart rate with real-time patient location tracking. System developed can read and monitor the following user's vital signs: safety, heart rate, and temperature. System was intended to define specifications required for the device's66 SSBS:IOT-ENABLED EMERGENCY ALERT SYSTEM. The system was developed primarily utilizing the NodeMCU ESP32, GPS and GSM Module. The researchers used a Prototyping Method for the system entitled IoT-Enabled Emergency Alert System Enhancing Safety for Elderly, Pregnant Women, and Persons with Disabilities. The system developed can only be used with a stable data or internet connection. Real-time movement tracking was made possible by the gadget

using Google Maps coordinates and a NodeMCU ESP32 as the central processor unit. The gadget was fitted with a heart rate sensor and an LM35 body temperature sensor. The A9G module was developed by AI-Thinker and is renowned for its data processing, positioning, and communication capabilities. The system developed has an assistive button and users can press it, whenever they need assistance. The heart rate measurements obtained from the developed system are presented in viewpoints Table 14 and Table 15. All three indicators were rated as very acceptable, with weighted means of 3.60, 3.69, and 3. 60, respectively. All values fall in the scale value described as veryacceptable.

DISCUSSION

The SSBS project effectively achieved its primary objectives of implementing realtime location tracking as well as vital sign monitoring for the elderly, the pregnant, and the disabled. The SSBS Emergency Alert Device was proven to send alert signals when there are changes in body temperature and heart rate. The prototype, evaluated using the prototype evaluation form, received a grand weighted mean value of 3.53. The system efficiently showed that it was capable of wide monitoring and surveillance of elderly, pregnant women, and individuals with disabilities. The system can be improved by adding additional sensors for other vital signs. It can be used when the user?s location exceeds 20 meters and is 40 meters away from his/her caregiver/guardian. To get accurate location data, even when inside room or in a building, look into more advanced GPS technology or a hybrid method that combines GPS with other sensors. The system can also be used to monitor the user's health and well-being in a hospital. It is available in the U.S. and Canada.