

Personal Assistance Device for Independent Senior Citizens/ Patients



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Abstract—Tracking the health of a person and proper medication improves their life time. Studies suggest the most of the deaths of the elderly people have occurred during the night when the person is asleep. A Caretaker cannot assist a person all the time. This work proposes a personal assistant for an elderly people or a patient. The Personal assistants can provide in-home respite care, allowing family members or other caretakers to take a temporary break. The main objective of this work is to help seniors maintain their quality of life at home and to keep them living their lives their way, as well as to lighten the load of full-time or family caretaker.

This paper proposes an affordable personal assistance device for health monitoring of elderly people using different sensors which can measure pulse rate, position of elderly. Therefore the doctor can identify the abnormal values easily and can attend the patient if the device is used in the hospital. Proper intake of medicine at correct time is indicated by the display on OLED screen and an alert is produced by buzzer.

Index Terms— Personal assistants, health monitoring, elderly, Caretaker.

I. INTRODUCTION

Giving consideration to others can be distressing and can probable upload to despondency and proper disorder. Studies have exhibited that round 16% of parental figures record their wellbeing has intensified due to the fact they became guardians. Providing care might also result in more budgetary weights; roughly 40% of guardians collect new financial costs diagnosed with administrations, items, and sporting activities. One gauge expresses that 26% of parental figures spend round 10% of their month to month pay on supplying care costs.

Fig.1. Shows the block diagram of the Personal Assistance device .Personal assistance device is a handy device which provides a way for improving the health care services. This device tracks the pulse rate using pulse sensor and the motion of the person is tracked by accelerometer and their respective readings are displayed in the mobile application. IOT pulse

sensor and accelerometer can be connected to communicate and transfer information between patient and doctor.

This system can assist the elderly with health check-ups. So doctors or care takers can follow the health condition of the elderly. Moreover, due to the functional and physical limitations the elderly may not be able to inform anything to anyone when they feel sick, so just by pressing a push button the information can be passed to the doctor or caretaker.

Personal assistants can be used to supplement the care of a family member or other caretaker by fulfilling a required task. Personal assistants deliver care and companionship when you can't be there, or when you simply need a hand.

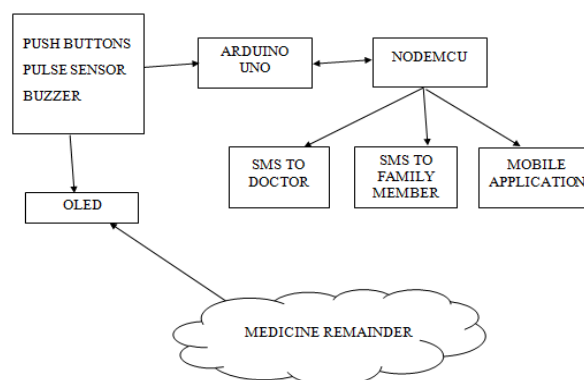


Fig.1. Block Diagram Personal Assistant Device

II. WORKING OF PERSONAL ASSISTANT DEVICE

When the elderly wear the device, the pulse sensor present in the device measures the pulse rate, later these readings are sent to the Arduino-uno. The data from different sensors are sent to the Arduino and through NodeMCU. These measured values are sent to the doctor application and then the caretaker can check the readings frequently. If the patient does not know how to use the mobile then the device has some push buttons just by pressing them the alert is sent to the doctor or caretakers mobile application.

The proposed personal assistance device has two main parts:

- 1) Hardware and 2) Software. The hardware is the device which the patient can use for measuring the pulse rate and position of the patient. The purpose of this work is to create a daily health monitoring. These measure-monitor data will be sent to allthings talk-maker application in the doctors mobile. The software part is the MIT app inventor and thingspeak and Arduino IDE.

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B. Hardware

The main components of the personal assistant device are Arduino-uno, NodeMCU, Pulse sensors, Accelerometer and OLED Display.

1) Arduino-uno

The microcontroller board used is Arduino Uno. It is based on the ATmega328.

There are 14 digital input/output pins in Arduino-uno. Out of these 14 pins 6 pins can be used as PWM outputs. The digital pins (14) on the Uno can be used as an input or output. USB connection or an external power supply is used to power up the Arduino-uno.

2) NodeMCU

NodeMCU is an open source IoT platform. It comprises firmware which runs on the ESP8266 Wi-Fi SoC from Espressif Systems. It consists of inbuilt Wi-Fi module that supports Wi-Fi networking internet to connect to internet to fetch or upload data. 3.3V power supply voltage is required by ESP8266 chip. It consists of 10 GPIOs labelled D0-D10, PWM functionality, IIC and SPI communication.

3) Pulse sensor

Pulse sensor is a plug-and-play heart rate sensor which can be used by anyone who wants the live heart-rate data for further processing.

C. Software

Data from pulse sensor and accelerometer is analog, sensors are connected to arduino and the data from arduino is transmitted to NodeMCU. Data from NodeMCU is acquired using arduino 1.6.7 IDE. NodeMCU has built in Wi-Fi module that supports internet connection.

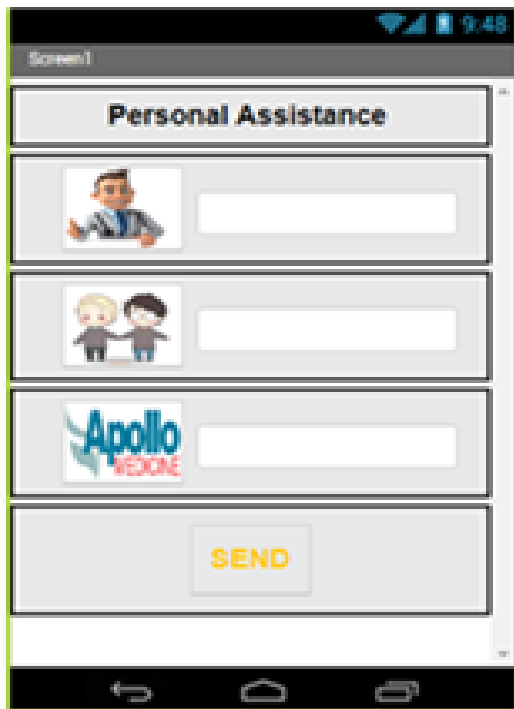


Fig 2. Mobile application Screenshot

The main parts of software are mobile application for doctors or caretakers, mobile application for patients, thingspeak, pushingbox notifications.

Mobile Application for doctors:

The mobile application for the caretaker is All things talkmaker. This platform is developed by allthings talk. The values of the sensors are displayed in this mobile application.

Mobile application for patients:

The mobile application for patients used is MIT app inventor that sends the message to the numbers which are already stored. Here voice commands are converted into text and sent to the predetermined number.

Thingspeak:

Thingspeak is an open source IOT application and API to store and recover data over the internet. The name of the tablet which is to be taken at a particular time is stored as command in talk back. Talkback enables any device to act on queued commands and timer control works to perform an action at a specific time on or a regular schedule. The commands are displayed on OLED screen of the device.

PushingBox notifications:

PushingBox API is to launch a scenario of notifications. It is necessary to add the services that are required to be notified from before creating a scenario. Then add an action, choose the service to be used and write the text to be sent. Device ID is the only argument to be attached. Without a specific request from the client, Push notification, is the delivery of information from a software application to a computing device

The foremost advantage of pop-up messages in versatile registering is that the innovation doesn't require explicit programs on a cell smartphone to be open all together for a message to be gotten. This permits a mobile smartphone to get and display internet based totally life or instantaneous message alarms in any event, when the gadget's display is bolted and the web networking software this is pushing the attention is closed. Fig three indicates the Pushing Box administrations.

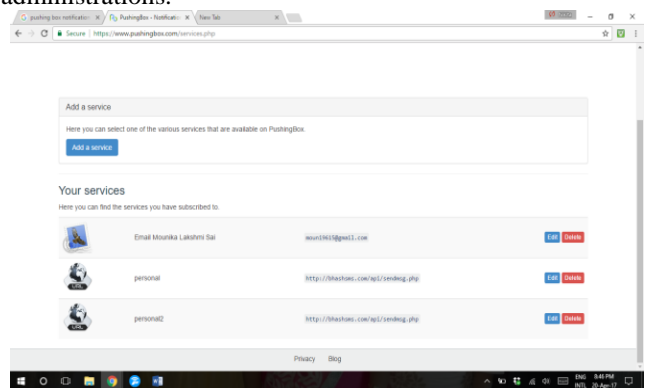


Fig .3. Pushing box services

Fig 4 shows the Pushing Box Scenario.

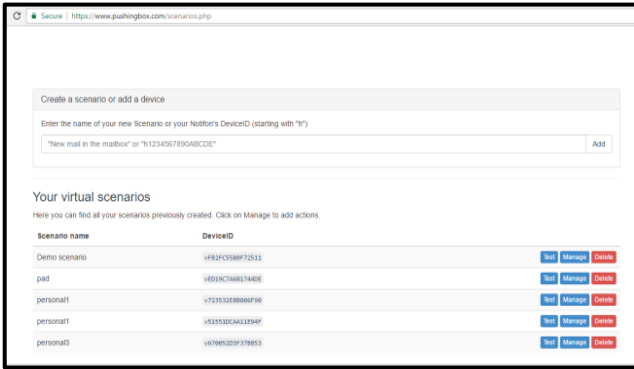


Fig.4. Pushing box scenario

Fig 5 shows the action performed by the push buttons on the OLED screen



Fig. 5.OLED displaying the action performed by push buttons.

Fig 6 shows the message regarding the reminder for intake of medicine on OLED

Fig.6.Displaying the reminder for intake of medicine on OLED

Fig. 7 .Shows the values of various sensors in the mobile application of Caretaker



Fig. 7.Displaying the sensor values in Caretaker's/doctor's mobile application.

III. RESULTS

An experiment is conducted on an elderly person who is in need of Personal Assistant Device and the following results are obtained . Fig.8 shows the screen shot of the message received by the care taker when the push button is pressed



Fig. 8.The SMS received by caretaker when push button is pressed.

Fig.9. shows the medicine reminder that gives the information regarding the intake of medicine by the person using the personal Assistant Device



Fig.9. The Results Displaying on Assist-Me Device.

IV. CONCLUSION

With the continuously increasing utilization of internet in this point in time, this assignment paintings has been engaged to execute a framework depending on web innovation which could discuss through internet for health checking of patients and for giving assist to vintage people. This paper provides shape and operating of an IOT based totally Personal Assistance Device which is a helpful device using low force Atmega328 microcontroller and ESP8266. In this paintings, accelerometer is utilized to apprehend the development of patient even though heart beat sensor module supply pulse of patient that is ship to microcontroller unit which sends this statistics to everything communicate producer to reveal the readings using ESP8266 Wi-Fi conference. During the crisis situations, a caution might be raised over the internet level telling the expert/overseer by way of the patient simply by squeezing a seize in the helpful machine. This offers a trustworthy framework which can screen the well-being reputation continuously of a patient or an vintage individual.

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