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DESIGN AND IMPLEMENTATION OF SMART CITY SYSTEMS BASED ON IOT APPLICATION

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Abstract: ***The majority of the total populace today lives in urban communities. Because of absence of asset requirements, it appears as though there will be an issue in the future to offer every one of the types of assistance offices to the occupants. To keep on keeping up with, serve and work on the quality and way of life of the developing populace of country, important to foster specific computerized applications can be utilized in a shrewd city which will give us administrations as per our need. The various utilizations of Smart City try to make ideal and practical utilization of all assets, at its best with keeping a fitting harmony between our social, natural, and all sort of financial expenses. The principle order that characterizes utilizations of shrewd urban communities incorporates the nature of the climate, energy that is drunk, water and wastewater that is been depleted, and all sort of transportation and traffic, correspondence frameworks, personal satisfaction, information framework government, financial matters, HR, lodging and land use, country security.. There are many benefits in advancing shrewd urban areas as far as public advantages: making seriousness among various classes, advancing the business area, improvement of expectations for everyday comforts, legitimate use of re-sources. There are instances of savvy urban areas on the planet, and an IoT can be gained from their experience and accomplishments. Remembering for the need of IoT innovation in our group of people yet to come, in our undertaking we are creating two unique IoT based brilliant frameworks i.e., wellbeing checking framework and Home computerization framework that can be utilized in shrewd city model and further according to future necessity we can add all the more such applications to our task.***

Keywords - smart city, Internet of Thing (IoT), smart health monitoring, smart home

1. INTRODUCTION

As a general rule, we can say a brilliant city is a created metropolitan region that is created by utilization of various kinds of gadgets strategies and sensors to gather information and decipher into our valuable requirements. A shrewd city further develops transportation and availability; it advances maintainability and gives its residents a voice. By the advancement of a savvy city, we are attempting to further develop strategy adequacy, diminish the bother, and work on friendly and financial quality in each conceivable way and augment social incorporation.

Savvy wellbeing Monitoring: - The Smart medical care is utilized to screen various boundaries of medical problems and it is generally vital to those individuals who constantly need to screen and quantify and which can't be occurred outside hospitals .This work is accomplished to have a brilliant wellbeing observing framework that will utilize different biomedical sensors and will actually take a look at patient's condition and uses web to illuminate the concerned.

Savvy Home Automation: - In our undertaking we are controlling home apparatuses utilizing microcontroller and sensors which detects the situation with machines.

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2. SMART CITY STRUCTURE

Shrewd city structure comprises of different conveniences which will assist with satisfying necessities of public in a savvy city. With the utilization of IoT based applications we can mechanize different elements of a savvy city as follows. This can be classify in three layers,; in which the principal layer is the "discernment layer", which is answerable for gathering various information from various information sources like cameras, Sensor organization; GPS, then, at that point, second layer, "Organization Layer" which is liable for sending information, and gather information from layer 1 to information stockpiling focus, and layer 3 is named, "Application Layer" containing applications for examining and handling the enormous information living in the information stockpiling focus

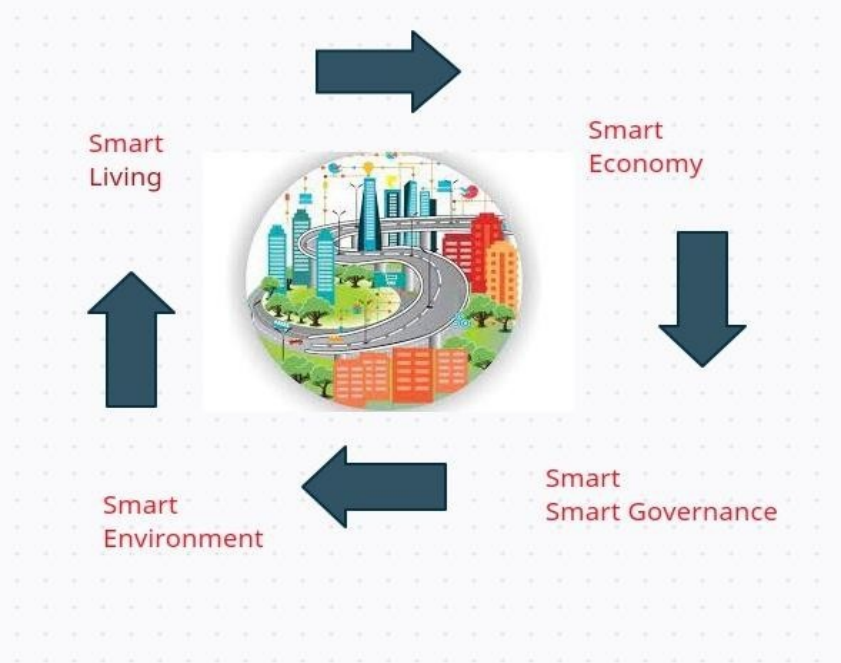

Fig 1 Characteristics of smart city

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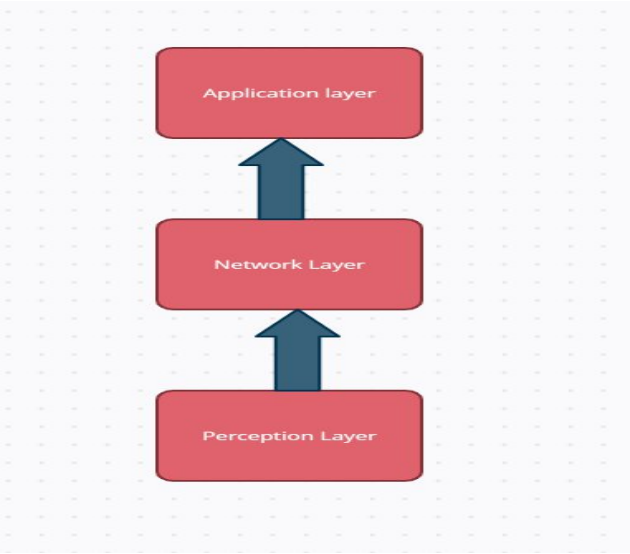

Fig 2 Architectural diagram of smart ci

3. HARDWARE AND DESIGN IOT SYSTEMS

3.1 IoT Based Patient Health Monitoring System using ESP8266 and Arduino.

Wellbeing checking is one of the serious issues that we find in this day and age. Because of absence of appropriate wellbeing observing gear that are accessible at their home, patient experience the ill effects of genuine medical problems. There are sure of IoT gadgets now days we can screen the strength of patient over web. Wellbeing specialists are likewise exploiting these savvy gadgets to watch out for their patients. With huge loads of new medical services innovation new companies, IoT is quickly reforming the medical services industry.

Here in this undertaking, we will make an IoT based Health Monitoring System which will records the patient heartbeat rate and internal heat level and can likewise send an email/SMS alert at whatever point those readings go past basic qualities. Beat rate and internal heat level readings are recorded over Thing Speak and Google sheets so understanding wellbeing can be observed from anyplace the world over web. A frenzy will likewise be Materials required.

1. Arduino Uno and Programming Cable
2. ESP8266 Wi-Fi module
3. LM35 temperature sensor
4. Pulse rate sensor
5. Push button
6. 10k Resistor
7. Male-female wires
8. Breadboard
9. Straightforward Home Automation Using Bluetooth, Android, and Arduino

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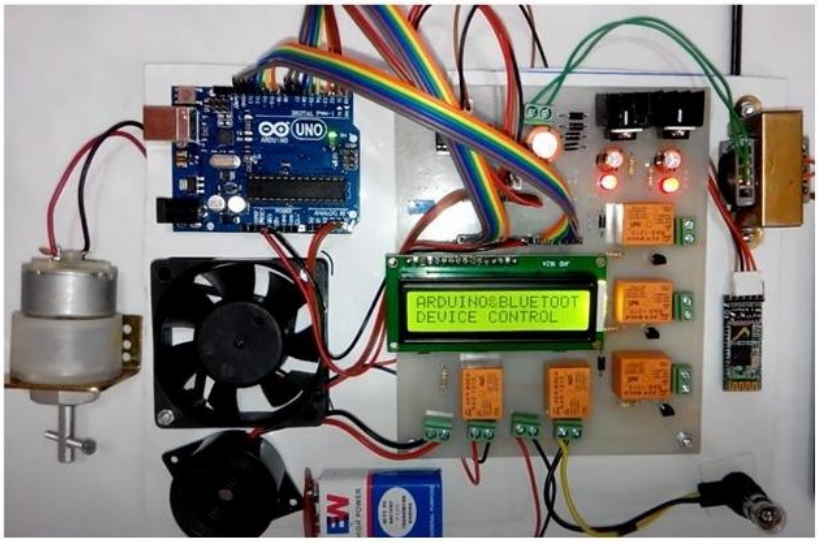
These days because of colossal measure of work any bustling life individuals like to take care of business at their home and hope to work most elements on a was a tick. Thus, we can do this with the assistance of mechanizing different things at our home. In this model with the utilization of android application we have coordinated our model. Also this model will allow us to work our lights and fans alert engine on a tick with the assistance of android application.

Parts required:

- Volt 4 Channel Arduino Relay Module
- 12 Volt DC Fan
- Arduino Uno REV3
- HC-03 Bluetooth Module
- LCD Display
- 12 Volt DC Bulb
- Signal
- Engine



Home Automation System Hardware

Fig 3 Hardware of Smart health monitoring system

3.2 ARRANGING THING SPEAK TO RECORD PATIENT DATA ON THE WEB

Thing Speak is fundamentally a cloud that gives magnificent device to IoT based tasks. By utilizing Thing Speak website, we can screen our different information simultaneously and control our framework over the Internet, by the utilization of the Channels and Webpages given by Thing Speak. Thing Speak 'Gathers' the information from the sensors, 'Dissect and envision' the information and 'Acts' by setting off a response. We will utilize Thing Speak to screen patient heartbeat and temperature web based utilizing web.
Here first make a channel named as a Patient Health Monitoring that will screen the beat rate and Temperature of Patient

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4. INDENTATIONS AND EQUATIONS

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FIGURES AND TABLES

Fig 4 When we turn device 1 (fan On)

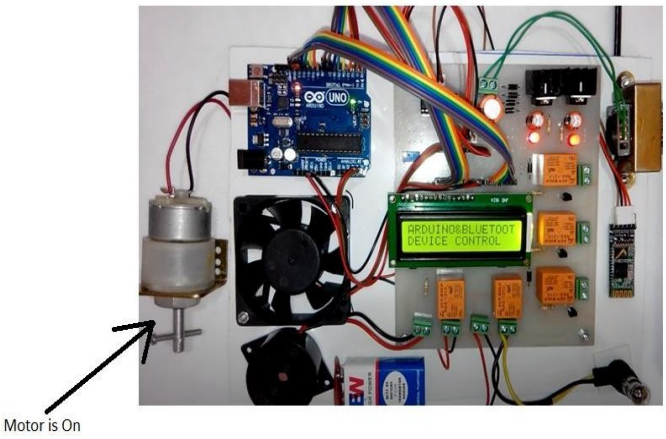

Fig5 When we turn device 2(Motor ON)

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Fig 6 When we turn device 3 (Bulb ON)

Date		Pulse Rate (BPM)	Body temp.(F)
27/1/2021	Patient Monitoring	217	51
27/1/2021	Patient Monitoring	127	53
27/1/2021	Patient Monitoring	220	50
28/1/2021	Patient Monitoring	222	54
28/1/2021	Patient Monitoring	209	90.1
28/1/2021	Patient Monitoring	121	86.5
29/1/2021	Patient Monitoring	103	83.9

5. CONCLUSION

5.1 AFTEREFFECT OF HEALTH MONITORING SYSTEM:

With the assistance of cloud, the particular information of patient's pulse and internal heat level a chart is plotted on the Thing talk cloud. With the assistance of channels and site pages made this chart is plotted.
With the assistance of Blynk application we have made an application which let us work the model of home computerization framework. Furthermore with this application we can work brilliant light shrewd fan and different other electric apparatuses that are in our home.

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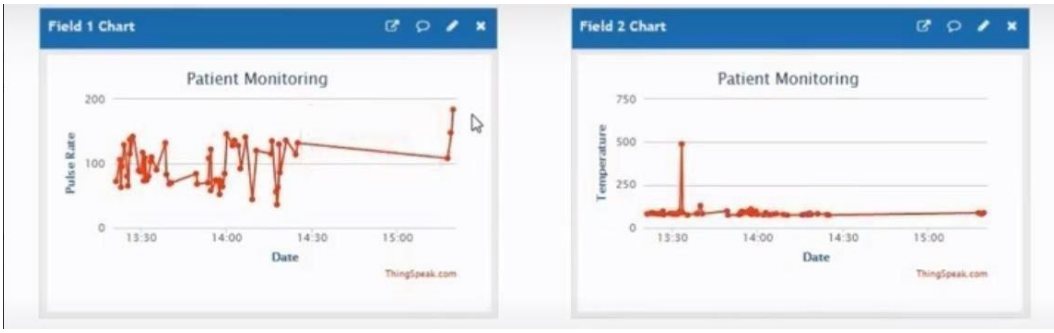

Fig 7 graph of patient body temp and heartbeat

While most everybody can concur that savvy innovation has the ability to make our lives a lot less difficult - particularly in profoundly populated metropolitan regions - carrying out that innovation should be done in a painstakingly arranged and exceptionally secure way. Brilliant advances can give answers for urban communities by assisting them with setting aside cash lessen fossil fuel byproducts and oversee traffic streams. Shrewd Transportation, decreasing clog and contamination, can have incredible advantages as far as cash and time saved.

Savvy Buildings, associated with one another, saving assets, and in any event, creating their own power and warming, can help manageability and add to the economy day by day.
So with Help of this task, we attempt to mechanize different frameworks of a savvy city we have made a portion of the models to it and can additionally add all the more such models which will help the govt to make the city more brilliant and to the residents to carry on with a more intelligent and more promising time to come ahead.

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