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Design & Development Of Real Time Rapid Inventory Access System Over Wi-fi Network Using Android App

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Abstract: Technology is of great importance and wireless sensor networks are the backbone of the wireless technology. In this paper we proposed a rapid inventory access system using WSN technology through android app, which is password protected. Using this inventory app, the communication between the embedded hardware module and the app takes place and the items of the inventory get selected. The embedded module and the app both have portable feature in it with which we can add delete and modify the nodes without the involvement of the core development interference. The inventory user gives the commandthrough the mobile app and the command will be received in the embedded hardware sectionand the inventory get audio and visually alarmed and the data is sensed.

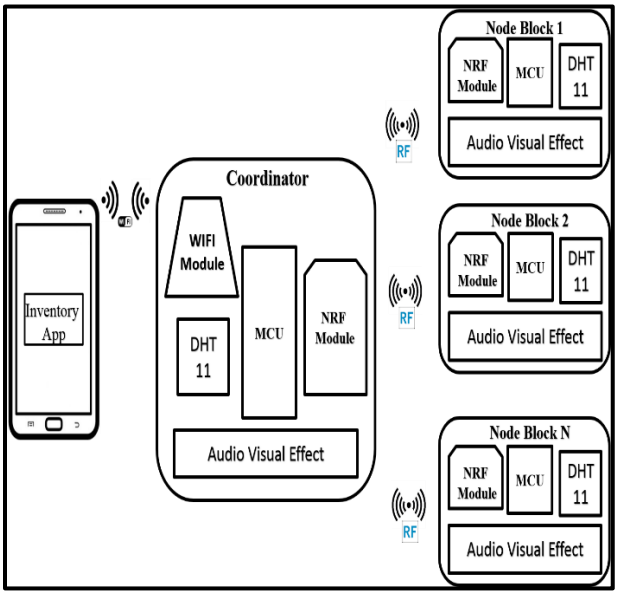
KEYWORDS: Wireless sensor network (WSN), Microcontroller ATmega-328, Wi-Fi Module (ESP8266), Wireless Module (NRF24L01+), Sensor (DHT11).

Introduction

A real time rapid inventory access system using a WSN technology [1] is proposed.The system has an inventory app installed in Smartphone of the inventory user and the app is password protected .Secondly the user have to enter the IP address of the Wi-Fi module to open the app installed in the android handset ,On entering the correct password and the correct IP address of the Wi-Fi module(ESP8266)[2],the app functions accordingly and selects the items according to the user interface and the commandgenerated from the app will get transmitted through the wireless

medium[3]Now through the Wi-Fi module[4] the command is received by the microcontroller (ATmega-328) which is known as the brain of the control unit ,which contains a code receive ,as the microcontroller gets a code receive command ,the microcontroller transmits the data to the wireless module (NRF24L01+).The wireless module connected to the microcontroller act as a coordinator ,that transmits the data on a particular node .The microcontroller sends the data to the coordinator with the item name , the coordinator reads the address from the node and sends it to the microcontroller LED, which is connected to the port of the microcontroller glows up and simultaneously an alarm is raised by the buzzer, creating an audio visual effect.and the DHT11sensor provides the digital output of the surroundings parameter

Proposed system overview

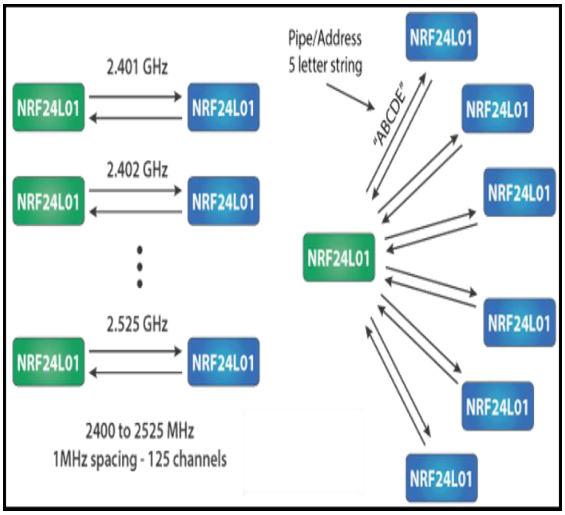


The proposed work here is to develop a real time rapid inventory access system over a wi-fi network, using an inventory app and the hardware assembly.

Working with NRF24L01+ Module

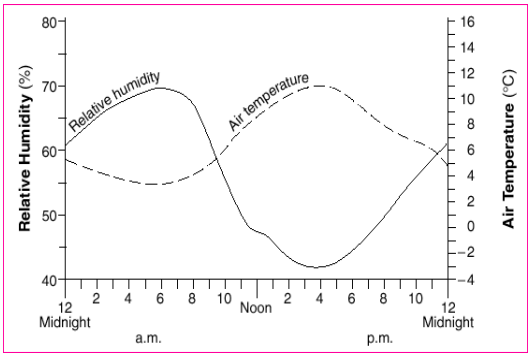
NRF24L01+ working with different channels

The module NRF24L01+ can use up to 125 different channels that give a possibility to have 125 independent network modems working in one place. Each channel can have 6 addresses, so that each unit can communicate 6 other units at a time.



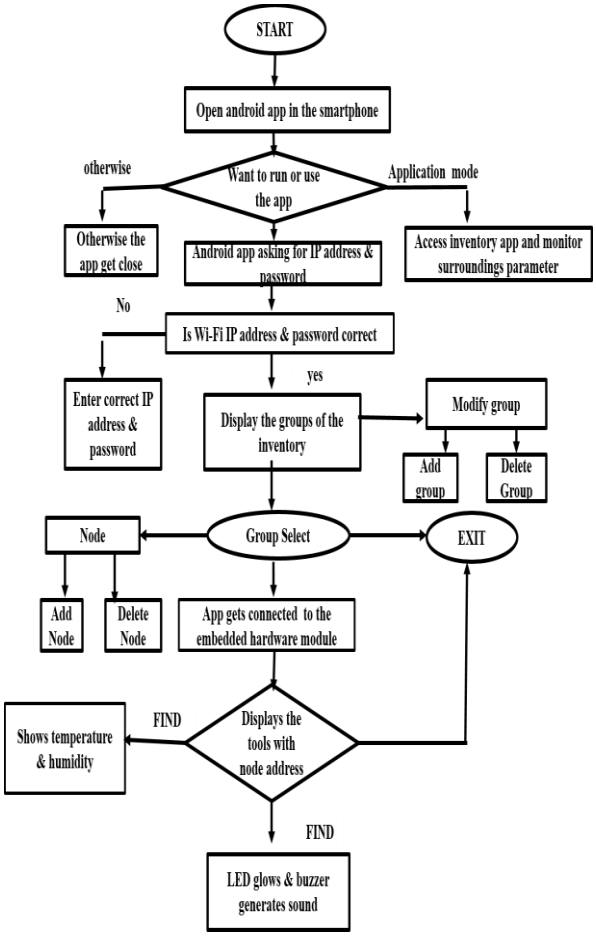
Temperature & Humidity

Proposed research work monitors the physical parameters of the surrounding in which the data is sensed and the output is obtained on the inventory app screen. The figure given below shows the relation between temperature and humidity



System Methodology

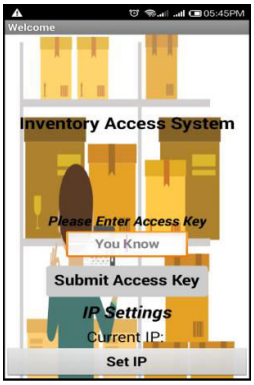
The system methodology reveals the overall view of the proposed research work that how the system works



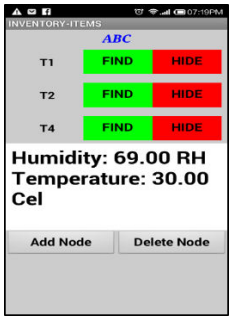
Results

In the proposed system the digital output is obtained on the inventory app which shows temperature and humidity

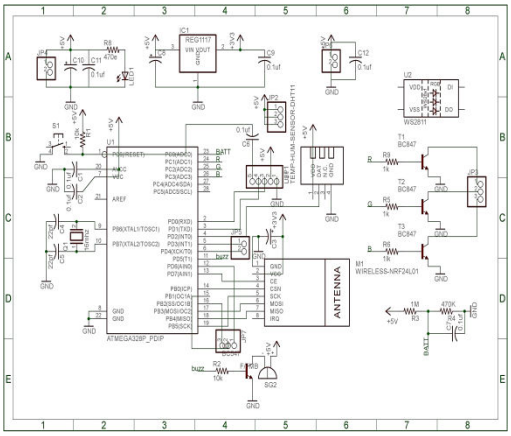
- As the user opens the inventory app installed in the Smartphone, the inventory app requires Wi-Fi IP address and the password to open the screen. As shown the figure



Finally, the user got the digital output of the surrounding parameters



- Simultaneously an alarm is raised by the buzzer creating an audio visual effect in hardware assembly.



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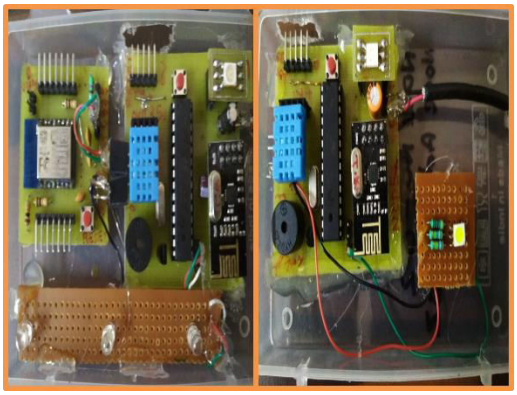
The figure given below shows the hardware of the main coordinator unit and the block node of the embedded hardware module used in the proposed system.



CONCLUSION

The inventory access system is able to develop android app for the inventories which makes the work of the inventory user to easily access the items from the inventory. The system is also providing number of wireless nodes for different blocks of the inventory system because of these different block nodes the proposed system can be used on the large scale. As the inventory app connects to the embedded hardware module. It creates an audio visual effect for accessing the inventory blocks and this audio visual identification avoids confusion and delay and finally smart android app also provide temperature and humidity of the inventory in the form of the digital output on the app screen.

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