Industrial Automation Using Android Mobile via Bluetooth

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Abstract: *As the world is becoming more technologically advanced, industrial automation becoming more popular. Android is open-source software, manufacturers can modify the operating system for a particular application. This becomes a cheap and feasible alternative for the manufacturer, as hiring a software company to do it. The Android platform supports the Bluetooth network stack, which allows a device to wirelessly exchange data with other Bluetooth devices. The application framework provides access to the Bluetooth functionality through the Android Bluetooth. This paper is mainly focused on the implementation of a prototype system for industrial appliances control like the speed of DC motor, heating coil and light intensity using Android mobile & Bluetooth technology.*

Keywords: PIC microcontroller, Bluetooth module, DC motor, Hall Effect sensor, temperature sensor, LDR, Android mobile phone

I. INTRODUCTION

In fast moving world, time is most important factor. You can tum on/off device in the industry by giving command through cell phone. It will save time as well as manpower required to control industrial devices by using key command on android mobile, we can control six devices. We can increase the number of devices. Most important factor about this project is that it is controlled using an application on android mobile. The person who has installed this application on his/her android mobile can only Interfere in the controlling devices. Also, it removes the need of carrying a remote control to turn on/off the devices. This project has integration of Android mobile technology and embedded system. Android mobile user has to install an application on his/her mobile handset to control the devices. Then he/she can give command using the buttons on that application. For this you have to turn on the Bluetooth on mobile, so the main wireless controlling technique used in this project is Bluetooth technology. Bluetooth receiver will be connected to the project. This Bluetooth device is connected to the circuit which has a decoder. It sends out a code for respective command sent by user. Then the respective device connected to the circuit will be turned on or off depending on the command given. For example, turn on Fan, Turn off Fan. Turn on buzzer etc. Such that by giving commands from mobile you can control industrial work. This is more advantages, when we have to turn on the machinery at the time when we had another urgent task to do and we cannot get up from our place. In this case we can turn on machinery giving simply command through mobile phone. There is no need to go to field.

II. THE PROJECT

2.1 Existing System

The existing system comes with only a single remote controller with only a single device. So, if the number of devices increases the number of remotes also increase. If we are having 100 such devices, then we need to have 100 such remotes separately for each device

2.2 Proposed System

The proposed system is implements by using a Microcontroller board which will be operating the devices which needs to be controlled via Microcontroller 8051 board. For this project we are going to use a Bluetooth module HC-05

connected to user's mobiles Bluetooth in order to communicate with user's smart phones using serial data communication. A program is written in the KEIL Microcontroller Programming Software which is then compiled and uploaded in the microcontroller. The processor executes the program and controls the flow of electrons throughout the board and the pins of the board. We can connect multiple analogy devices in order to get the input data from the natures surrounding and process the data to control the digital devices. This whole event is carried out at the real time which in leads in the home automation Devices like infrared sensors, ultrasonic sensors, proximity sensors, temperature, etc. can be attached for getting the input from the surrounding

III. ANALYSIS

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IV. TECHNOLOGY USED

A. Bluetooth
B. DTMF (Dual Tone Multiple Frequency)
C. Microcontroller
D. Flip-Flop (Latch

4.1 Hardware Requirements

System	Pentium IV 2.4GHz
Hard dix	40 GB
Floppy drive	1.44 Mb
Monitor	15VGA Color
Mouse	Logitech
Ram	512MB
Mobile	Android

4.2 Software Requirements

Operation system	Windows XP
Coding language	Java 1.6 and C(C foe microcontroller)
Tool kit	Android 2.2
IDE	Eclipse

V. FEASIBILITY STUDY

Feasibility study is the second stage of the "System development life cycle". For all new systems, engineering process should start with the feasibility study. The input to the feasibility study is only description of the system and how it will be used within organization. The result of the feasibility study should be report which recommends whether or not it is worth carrying with the requirement engineering and the system development process.

1. Economic Feasibility
2. Technical Feasibility
3. Operational Feasibility

- **Technical Feasibility:** The technical feasibility involves financial considerations to accommodate the technical enhancements, with the existing provision of computerization, the work can be completed efficiently. Project "Home Automation Using Android Mobile via Bluetooth" which is cost effective and any one can easily download it.

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- **Economic Feasibility:** Economic analysis the most frequently used method for evaluating the effectiveness of the system more commonly known as cost analysis the procedure to determine the benefits and saving that are expected form a system, the labor expense is reduce. The cost of the development of the "Home Automation Using Android Mobile via Bluetooth" is very less.
- **Operational Feasibility:** User friendly interface lets the user acquainted with software in relatively short time Our project was made in Android which support the android version 4.0-6.0 and it is user it is user friendly software. The GUI environment of the project made it easy to operate and operations are very quick
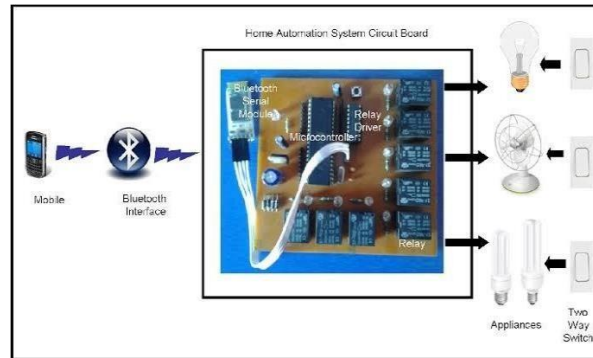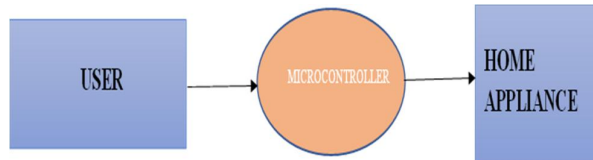
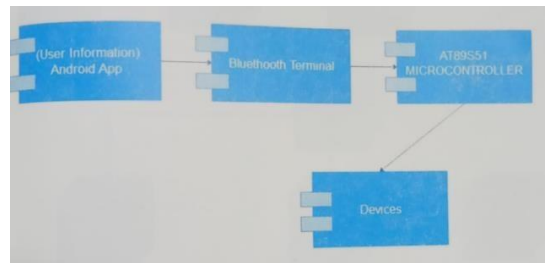## VI. PROJECT DESIGN
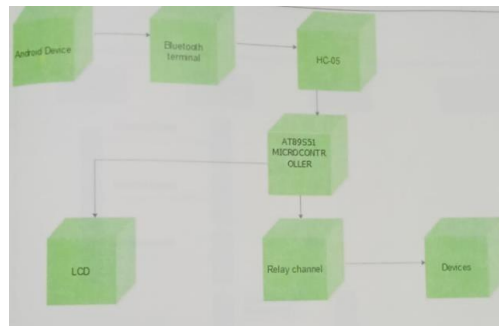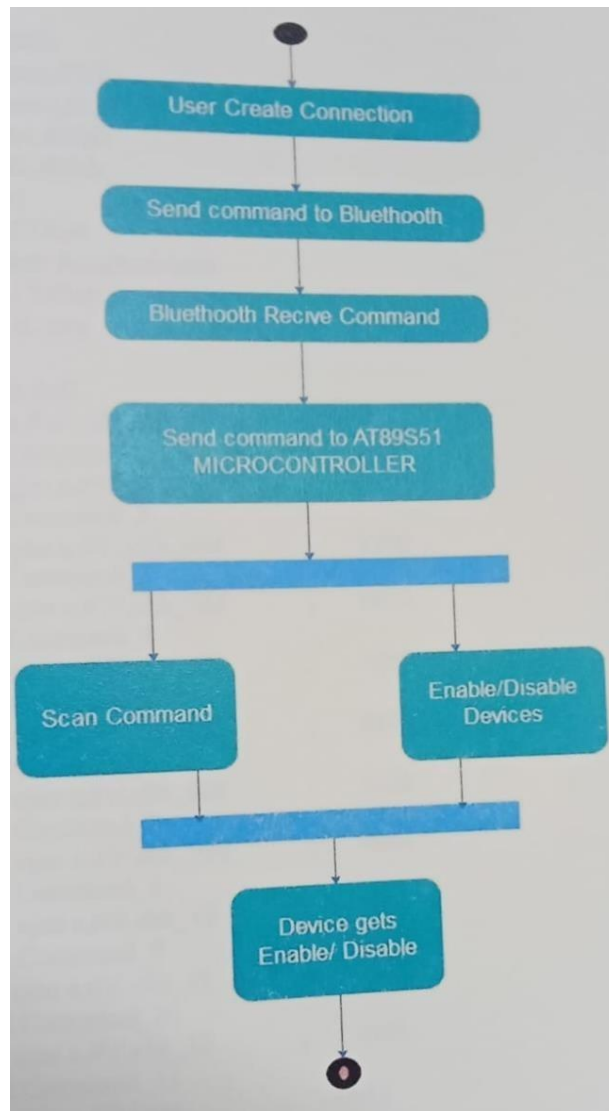
System Architecture

Figure 1. System Architecture

Data flow Diagram

Component diagram

Deployment Diagram

Impact Factor: 6.252

Activity Diagram

VIII. TESTING

A unit test is also called a module test because it tests the individual units of code that comprise application. Each test validates a single module that, based on the technical design document, built to perform a certain task with the

Expectation that will behave in a specific way or produce specific results, the main goal of unit testing is to isolate the smallest program of software from the remainder of code. After that developer determines whether, it behave exactly as per its expected output or not identifies the

Greatest number of defects before integration testing. We require stub and driver for this of testing.

IX. APPLICATIONS

1. Industrial automation - This project can be used to control various devices in the industry
2. Can also be used for security purpose after modification (we can control gate system or we can interface wireless camera and can control it using our mobile)

A. Industrial Control
1. It is used to control or switch on any automatic process.
2. Electric grid could be controlled remotely.
3. Automatic production machinery could be controlled even during odd hours with your mobile phones.
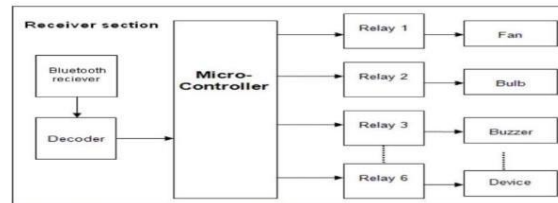
B. Home Automation
1. To monitor status of home appliances.
2. To control (ON/OFF) the home appliances according to their status when we are going away from home.

C. Farm Automation
1. To control & monitor the various irrigation equipment in the farm.

VII. BLOCK DIAGRAM

X. ADVANTAGES
1. Can control device from a long distance, thus it gives ease of access.
2. Faster operation and efficient.
3. No need to carry separate remote or any other controlling unit.
    a. Eliminates the continuously monitoring, it facilitates 24 hours a day, 365 days in year.
    b. Communication between system and user.
    c. Commands can be given through remote place, directly to the machine.
    d. By further modification security system can be added.
    e. Easy to install & simple in operation. Low cost, high reliability & flexibility.

XI. LIMITATION
1. It the GSM network used in mobile does not have any coverage then the operation cannot perform.
2. It is not useful for large number of application but by using multiple keys for devices operation we can increase number of operations.

XII. CONCLUSION

With the knowledge of new techniques in Electronics' we are able to make our life more comfortable. One ach application of electronics is used in "Home Appliances Controlling using Android Mobile via Bluetooth the approach we followed and which is explained in this project report is novel and has achieved be target of Home Appliances Controlling using Android Mobile via Bluetooth" satisfying user needs and requirements. Home Appliances Controlling using Android Mobile via Bluetooth is automatic versatile system. It can be implemented in industry, home, agricultural field, remote and hazardous applications. It provides the flexibility & system reliability with low cost a well as less maintenance. It provides remote access to the system to deliver service at any time of the day. With this system, we can control as well as monitor the devices at remote location. Hence, we can conclude that the required goals and objectives of our project have been achieved.

XIII. FUTURE ENHANCEMENT

1. Data logging facility can be included in case of recording historical data, special data, special events and system data.
2. Computer can be interfaced for more complex & precise application.
3. System reliability can be improved.
4. Voice interactive services can be added to offer better interaction with user.
5. For electrical supply we used solar panel.

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