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Office Chat Using ZigBee

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Abstract: *The rapid development in wireless and mobile communication technology is changing people's lifestyle. The cost effective and fast communication is important in today's generation. Though there are number of instant messaging applications available, the security is still an issue. This paper gives idea about constructing a wireless-based text chatting system. It explains the design of system and the effective use of technology. The main aim is to apply the security in communication.*

Keywords:*Wireless communication, Instant messaging, Security in communication.*

1. INTRODUCTION

The communication is very important phenomenon in human life. It is vital for the progress of the human kind. So it is important to make available a platform for the efficient communication. The rapid development in wireless technologies made it possible to achieve the Telecommunication in very efficient way. Telecommunication is communication at a distance by technological means, particularly through electrical signals or electromagnetic waves.

Previously distant communication were done using visual smoke signals, flag signal, etc. Audio messages were also used such as drum beats, whistles etc. The communication using trained animals and birds especially pigeons were popular in early times. Modern technologies involves electric signal communication such as telegraph, telephone; electromagnetic signal communication such as mobile phone, satellite communication, microwave transmission etc.

The wireless communication era begins in early 20th century when Marconi Guglielmo developed radio communication system followed by Charles Wheatstone and Samuel Morse developed telegraph, Graham Bell invented telephone in bell laboratories, radio invention by Lee de Forest and Television invention by John Logie Baird and Philo Farnsworth.

The world's effective duplex communication grew from 281 petabytes in 1986 to 65 (optimally compressed) Exabyte in 2007. Telecommunication plays vital role in world's economy, the global communication sector was about a $4.7 trillion sector in 2012.

But the security is still an issue in communication. The communication is secured when two systems are communicating without interruption of third party. For achieving this communication should be protected from eavesdropping or interception. But practically technical issues and sheer volume of communication limits security surveillance. For professional use it is mandatory to provide highly secured communication medium so as not to void the company polices.

The ZigBee communication is considered as very secured and fast communication due to its advanced properties. ZigBee is based on IEEE 802.15.4 standard. It communicates in zig-zag pattern like bees hence named ZigBee. It works on ISM band frequency of 2.4 MHz with RF data rate 250 kbps. Its power consumption is low and line of sight is 10-1000 meters. ZigBee is very well suited for intermittent data transmission. The point to point communication property of ZigBee can be used in a way to provide security for offices using one admin module and all other slave modules.

2. PROBLEM DEFINITION

The purpose of this project is to design a system which provides faster and cheaper but highly secured medium for the communication. The internet instant messaging is available which provides similar platform but the problem in such communication is about security of the professional sector and cost inefficiency. The main aim of project is to provide the secure communication platform for the professional companies which intern is cost efficient too. This will help in many other applications too like Office IDs, Automatic employee tracking system, calling system, files sharing in secured way, etc. System used for this project consists of following components:-

- ZigBee Module.
- Keypad Touchscreen.
- ATMEL Microcontroller (ATMEGA 16).
- LCD Display.
- A USB connector.
- Buzzer.

3. OBJECTIVES OF PROJECT

The primary design objective of the Office Chat system is to provide cost efficient and secured way of communication within an office building without voiding the office policies. The designed module should provide easy way of typing and transmitting the message silently. The receiver should receive same message with a blink of LED notification provided with a notification sound alert.

The secondary objective of the system is to develop an admin module which will keep watch over all employee communication. If previously saved banned keywords are used during employee communication the ALERT notification should be displayed on admin module with ALERT sound notification and communication system for that employee should stop temporarily and Admin should be able to take action against that employee.

The final objective is to provide Fast but limited ranged communication between two modules. The user should be able to send Personal Messages, Broadcast Messages and Group Chat too, but must be under Admin observation.

Block diagram of the system:-

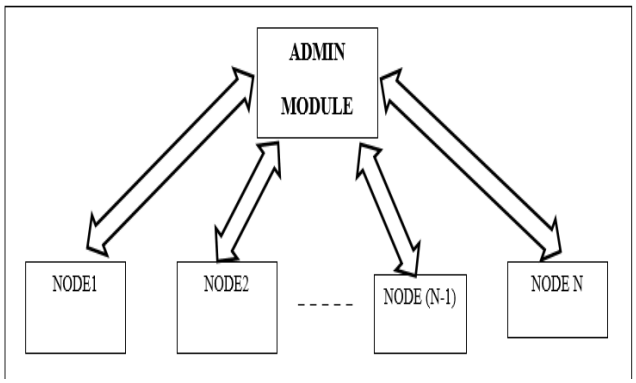

Fig1: Block diagram of system

For communication between nodes, messagemust be transfer through ADMIN module. ADMIN module should always be ON for communication. If admin module is in off condition then communication will not occur. Admin module plays vital role in the system.

Table 1: Component Specifications

Sr. No.	Component of the System	Details of the component
1	ZigBee Series 1	*RF data rate – 250 kbps *Indoor range – 30 meters *Outdoor Range – 100 meters *Interface Immunity – DSSS *Serial Data Rate – 256 kbps *Freq. Band – 0 to 2.4 GHz
2	ATMEGA 16	*No. of pins – 40

		*Internal Ram – 1KB *Program Memory size – 256 KB *No. of Timers – 3 *Operating voltage – 5 V. *Operating Temp - -40 to 85 C. *RISC Architecture.
3	LCD Display	16 Char. X 2 Row 4.2 V DC
4	Keyboard	Capacitive Touch Keyboard
5	Buzzer	Sound Alert Notification Buzzer.

4. MODULE WORKING

The idea of working of the module is as below:-

For Normal Communication:-

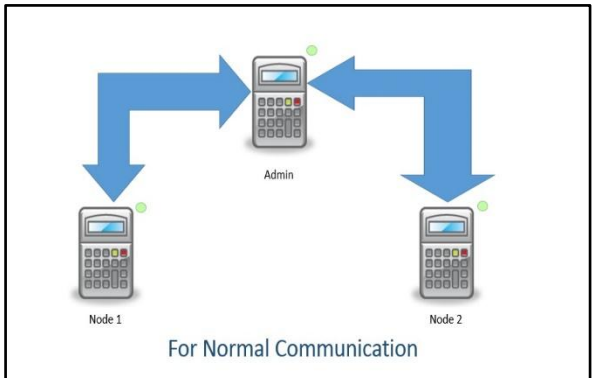

Fig2: ZigBee Communication A

For normal communication, Node 1 sends a message which first go to Admin the Module of Admin will scan the message for Banned words, if message is without any bad keywords then module of Admin will send it to the destination or receiver module. The Admin Can't read the message unless and until it contains the banned words (refer fig 2).

While using Banned Words

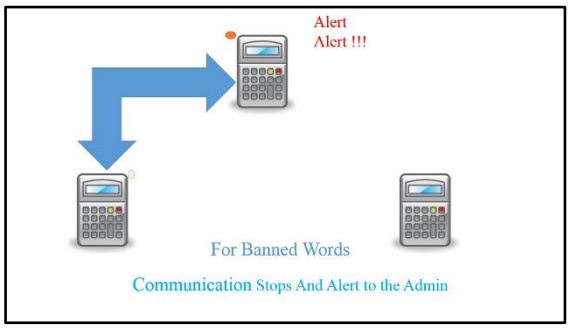

Fig3: ZigBee Communication B

If any of the employee used Banned words in his communication then the message will get scanned in the Admin Module, if banned word is detected then admin module will immediately stops the further communication and will disable the corresponding employee's device. Then it will sound the buzzer for ALERT and notify the Head person or manager. The admin or manager is now able to read the message containing Banned words and will able to take action against corresponding employee.

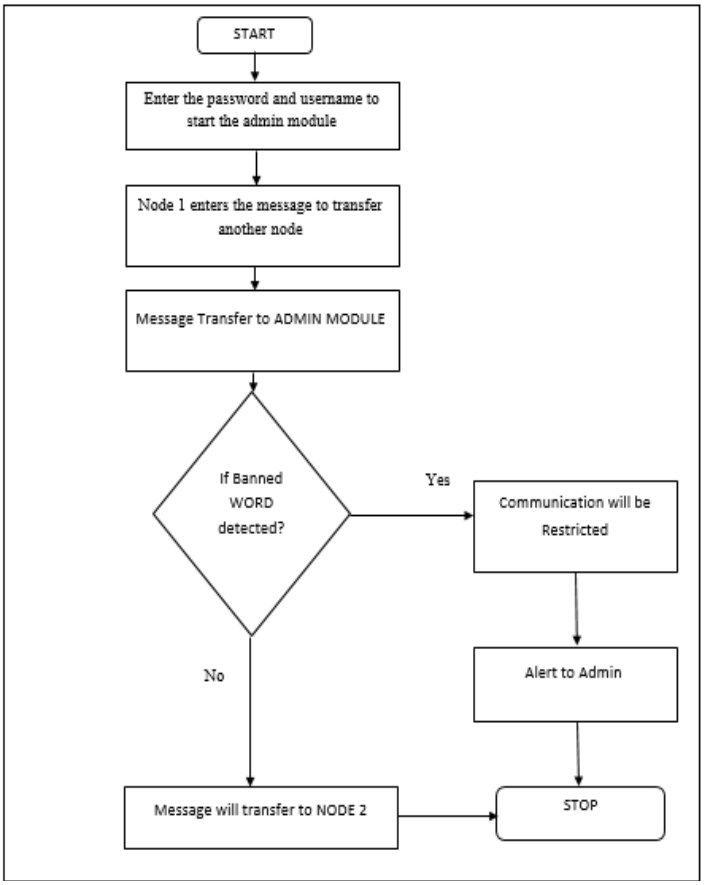

Fig4: Flowchart of system

5. CONCLUSION

This project is based on the simple idea of communication using ZigBee which provides cost effective platform for communication. Due to use of ISM band frequency the communication is fast and secure. The supervision of admin over communication provides additional security so the professionalism of company is maintained.

REFERENCES

[1] "ZigBee Specification FAQ". ZigBee Alliance. Retrieved 14 June 2013.
[2] "ZigBee Wireless Networking", Drew Gislason (via EETimes)
[3] ZigBee Document 053474r06, Version 1.0, ZigBee Specification. ZigBee Alliance. 2004.
[4] "IEEE 802.15.4". Ieee802.org. Retrieved 2012-10-18.
[5] "What's so good about ZigBee networks?". Daintree Networks. Retrieved 2007-01-19.
[6] Kai Kreuzer et al. "Developing Applications for Your Smart Home with QIVICON."Osgi.org. Retrieved 2014-05-08.
[7] "The ZigBee Alliance". Zigbee.org. Retrieved 2012-10-18.Seidu, S.O (2008). Influence of Inoculant's type on thermal analysis parameters of ductile irons, 4thinternaltion conference, Galati, Romania, pp. 237-241.
[8] "Wireless Sensor Networks Research Group". Sensor-networks.org. 2008-11-17. Retrieved 2012-10-18.
[9] "ZigBee Cluster Library Specification Download Request".Zigbee.org. Retrieved 2010-04-10.
[10] ATMEGA 16 Datasheet.
[11] LCD 20X4 datasheet

