Wireless Audience Response System

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Abstract—**Wireless Audience response systems have been envisaged to be one of the most useful e-learning technologies that have been notably employed to improve interactivity in classrooms. Students use state-of-the-art technology to convey their responses anonymously to the instructor's questions. Analyzing the responses is necessary to attain higher understanding of the lecture's material by students. This project describes the challenges of designing classroom response systems and proposes approaches to improve the classical classroom response system model. It looks into the potential of using ZigBee module which is a RF based technology along with the use of clicker devices to help students to interact and be more involved in class lectures and to help lecturer's measure productivity and accordingly change and improve teaching patterns. Furthermore, the project suggests using a dynamic content management approach to update and change the lecture's content seamlessly with the least amount of interference to the course of the lecture.**

Keywords— Microcontroller 89s51, Zigbee, Clickers.

I. INTRODUCTION

Wireless Audience response system is a type of interaction associated with the use of audience response systems, to create interactivity between a presenter and his/her audience. Systems for co-located audiences combine wireless hardware with presentation software, and systems for remote audiences The maximum benefit of this technology will be to the educational societies. In educational settings, such systems are often called "student response systems" or "classroom response systems." The hand-held hardware device that students use to convey their responses to questions is often called a 'clicker'. A clicker is a device which enables a student to send his or her information to a receiver. When presented with a Question, the student presses a button on a hand-held response pad or clicker, which sends either an infrared or radio signal to a receiver attached to a computer. The computer records and/or displays the response as per the instructor's preference. A clicker Device can be placed on every seat in a class room and the instructor showing how many buttons are to be pressed. Class room response system provides additional support the specific student requires and also caters the following needs if the institution wants to include such as

- Instantly contracting a histogram of class wide answers for instructor
- Managing rosters and student logins.
- Allowing an instructor to associate individual student with their answers.
- Allowing or requiring students to answer in small groups.
- Supporting integrated creation, management display, and archiving of questions.
- Permitting question types other than multiple choices

Students will now able to interact and be more involved in class lectures with the new Wireless audience Response System (WARS). WARS include a hand-held clicker device for students to use in class and on tests. It is connected to a system professors have on their computer and immediately provides feedback to both students and teachers. The Clickers use the ZigBee module. ZigBee is a specification for a suite of high level communication protocols used to create personal area networks built from small, low-power digital radios. ZigBee is based on an IEEE 802.15 standard. ZigBee is used in applications that require a low data rate, long battery life, and secure networking. ZigBee has a defined rate of 250kbit/s, best suited for periodic or intermittent data or a single signal transmission from a sensor or input device. Applications include wireless light switches, electrical meters with in-home-displays, traffic management systems, and other consumer and industrial equipment that requires short-range wireless transfer of data at relatively low rates. The technology defined by the ZigBee specification is intended to be simpler and less expensive than other WPANs, such as Bluetooth or Wi-Fi.

II. PROPOSED SYSTEM

The initial approach to the project was to do an extensive search of various classroom response system designs currently available and investigate their pros and cons. This lead to finding of many designs, but a very few could barely serve our needs. The main concern was to connect the clicker devices to the main computer which was with the professor. The very first technique used in this case was physically connecting the two with the help of physical cables. As this system is expected to be used in a classroom with the strength in hundreds the main disadvantage of this approach was the mess that would be created by all the wires which would be very difficult to manage and maintain.

The Following are the technologies which were researched and use for the clicker devices:

A. Infrared

The oldest of these technologies, IR in wireless Audience response systems are better suited for smaller groups. IR uses the same technology as a TV remote, and is therefore the only one of the four technologies that requires line-of-sight between the keypad and receiver. This works well for a single keypad but can fail due to interference when signals from multiple keypads arrive simultaneously at the receiver. IR systems are typically more affordable than RF systems, but do not provide information back to the keypad.

'Infrared' technology but it still had a few cons and so were not useful enough. The reason for this comes from the limitation of IR technologies. Infrared transmitters have a smaller range (optimal less than 45 feet) and require a line of sight between the transmitter and the receiver. This means that in classrooms with obstructed views or significant distances between the transmitters and receiver, a classroom response system using IR transmitters may perform poorly.

III. DEVICES USED

A. Microcontroller 89s51:

An embedded microcontroller is a chip which has a computer processor with all its support functions (clock & reset), memory (both program and data), and I/O (including bus interface) built into the device. These built in functions minimize the need for external circuits and devices to be designed in the final application.

- Features of 89s51:
- Compatible with MCS-51™ Products.
- 4K Bytes of In-System Reprogrammable Flash Memory Endurance: 1,000 Write/Erase Cycles.
- Fully Static Operation: 0 Hz to 24 MHz.
- Three-level Program Memory Lock.
- 128 x 8-bit Internal RAM.
- 32 Programmable I/O Lines.
- Two 16-bit Timer/Counters.
- Six Interrupt Sources.
- Programmable Serial Channel.
- Low-power Idle and Power-down Modes.

B. Lcd Display

A liquid-crystal display (LCD) is a flat panel display, electronic visual display, or video display that uses the light modulating properties of liquid crystals. Liquid crystals do not emit light directly. LCDs are available to display arbitrary images (general-purpose computer display) or fixed images which can be displayed or hidden, such as preset words, digits, and 7-segment displays as in a digital clock. They use the same basic technology, except that arbitrary images are made up of a large number of small pixels, while other displays have larger elements.

C. Power Supply

There are many types of power supply. Most are designed to convert high voltage AC mains electricity to a suitable low voltage supply for electronic circuits and other devices. A power supply can by broken down into a series of blocks, each of which performs a particular function.

IV. WORKING OF SYSTEM

1. Like most technology, this technology is made up of two general parts, hardware and software. The software components of these tools tend to have similar capabilities and modest learning curves. In the case of this, the software producers have integrated their tool with visual basic 6 to make the curve less steep. We will look at two main categories: radio-frequency (RF). From the user/student perspective, these types of devices are easy to use, being similar to a television remote control.

"Clickers" is a generic name for wireless in-class electronic polling systems used by students to answer questions during lectures.

2. These systems are based on a variety of technologies ranging from specialized radio-frequency handheld devices to laptop computers. Clickers have been used in lecture courses to involve students in learning material, to give quizzes and even to verify attendance. Student response summaries can be provided in real time both to lecturers and students. Student answers are stored in computer files that can be made accessible both for grading purposes and for educational research to improve the quality of teaching. For example, lecturers can ascertain the percentage of successful responses for students with different educational backgrounds. Questions presently are multiple choices, but work is ongoing to recognize other input forms such as calculations, words, phrases and even sentences. Clickers will be increasingly used for distance learning; computers and/or other required devices can be anywhere.

Working of clickers in the classroom-
• During lecture, your teacher poses a question within a PowerPoint slide in front of the classroom.
• Use your clicker to respond with your own answer. Keypad displays solid green
for 3 seconds when response is received as verification for a clear, visual confirmation that your response has been received and recorded.
• Your response is sent to a wireless receiver, collected and then sent to the classroom computer.
• Within seconds, you'll see the entire class results on the PowerPoint slide in front of the room.

Transmitter –
(Students Side)

RECEIVER
(Teachers Side)

FIG.1 THE SYSTEM BLOCK DIAGRAM
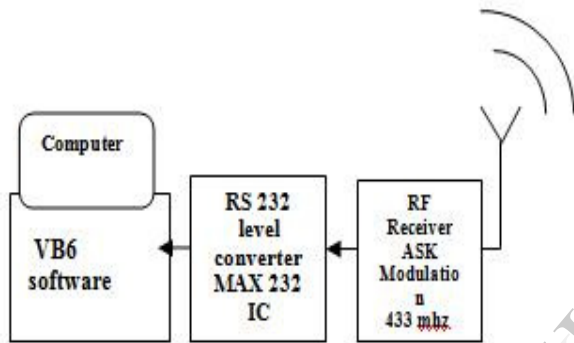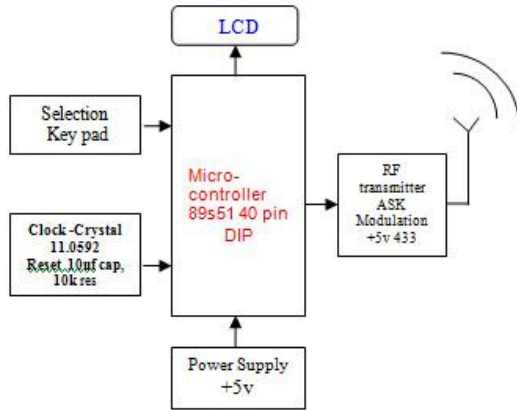
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