RES MILITARIS
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PRE-SCHEDULED COLLEGE BELL SYSTEM

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ABSTRACT
Now a day's many school/college bells are manually operated. Hence there is a huge demand of accuracy. In market there are many digital clocks available with bells but rings only at specific time and cannot stop after specific time. Here a new and inexpensive design is being presented. The benefit of this design is that the bell rings at the start of each period without any human intervention to a great degree of accuracy and hence takes over the manual task of switching on/off the college bell with respect to time. It uses Real Time Clock (DS1307) which tracks the real time. The scheduled time results are related with that of a clock, conversely, some drift is noticed, which is irrelevant. The microcontroller ATmega2560 is used to control all the functions, it gets the time through the keypad and stores it in its memory. When this programmed time equals the real time then the bell is switched on via a relay for a predetermined time. The bell ringing time can be edited at any time, so that it can be reused again and again at normal class timings as well as at exam times. Also it can be made password protected so that no unintended person can operate this system except for the operator. For this a microcontroller has to be programmed using the C language or assembly language for controlling the circuit.
Keywords: Microcontroller, RTC, Buzzer, Wi-Fi

I. INTRODUCTION

In today's life, everyone gives importance to time.Time does not wait for anybody. Everythingshould be performed in time & with accuracy.Now a day's school/college bells are operatedmanually. Hence there is a big question ofaccuracy. Also there is necessity of manpower andmoney. Hence here we have presented a system,which saves our manpower and money &alsogive highest accuracy. A bell is a percussioninstrument used in schools and colleges thatindicates the students when it is time to go to theclass in the morning and when it is time to changeclasses during the day. No other instrument can dosuch a work. So it is an important instrument inboth primary and secondary schools and even inthe industries and other businesses where the belltimer plays a critical role throughout the day.Clock towers can be heard over long distancewhich was especially important in the time whenclocks were too expensive for widespread use.And also due to literacy awareness the number or colleges, schools and institutions are rapidlyincreasing. At present bells for periods in schoolsare operated manually [1]. After every class, oneemployee is engaged into operating the bell.Automatic college bell helps us to avoid this. Thisdesign takes over the task of ringing the bell incolleges as the bell would ring automatically at the schedule time. It has a Real Time Clock(DS1307) which tracks overthe real time. When this time equals to the bellringing time, then the relay for the bell is switchedon. The real time clock isdisplayed on LCDdisplay. This is very wonderful design to controlthe working of college bell [2].

II. LITERATURE SURVEY

Now a day's many school/college bells are manually operated. Hence there is a huge demand of accuracy. In market there are many digital clocks available with bells but

rings only at specific time and cannot stop after specific time [3].Here a new and inexpensive design is beingpresented.The benefit of this design isthat the bell rings at the start of each period without any human intervention to a great degree of accuracyand hence takes over the manual task of switching on/off the college bell with respect to time [4]. It uses RealTime Clock (DS1307) which tracks the real time. The scheduled time results are related with that of aclock, conversely, some drift is noticed, which is irrelevant. The microcontroller ATmega2560 is used to controlall the functions, it gets the time through the keypad and stores it in its memory. When this programmedtime equals the real time then the bell is switched on via a relay for a predetermined time [5]. The bell ringingtime can be edited at any time, so that it can be reused again and again at normal class timings as well as atexam times. Also it can be made password protected so that no unintended person can operate this systemexcept for the operator. For this a microcontroller has to be programmed using the C language or assemblylanguage for controlling the circuit.In today's life, everyone gives importance to time.Time does not wait for anybody [6]. Everythingshould be performed in time & with accuracy.Now a day's school/college bells are operatedmanually. Hence there is a big question ofaccuracy. Also there is necessity of manpower andmoney. Hence here we have presented a system,which saves our manpower and money &alsogive highest accuracy [7]. A bell is a percussioninstrument used in schools and colleges thatindicates the students when it is time to go to theclass in the morning and when it is time to changeclasses during the day. No other instrument can dosuch a work. So it is an important instrument inboth primary and secondary schools and even inthe industries and other businesses where the belltimer plays a critical role throughout the day.Clock towers can be heard over long distancewhich was especially important in the time whenclocks were too expensive for widespread use.And also due to literacy awareness the number ofcolleges, schools and institutions are rapidlyincreasing. At present bells for periods in schoolsare operated manually [8]. After every class, one employee is engaged into operating the bell.Automatic college bell helps us to avoid this. Thisdesign takes over the task of ringing the bell incolleges as the bell would ring automatically atthe schedule time. It has a Real Time Clock(DS1307) which tracks overthe real time. When this time equals to the bellringing time, then the relay for the bell is switchedon. The real time clock is displayed on LCDdisplay. This is very wonderful design to controlthe working of college bell.Early methods included the hand ringing of bells - some ofwhich are still used at the moment. Progressively technologyhas seen the beginning of more dependable and more andmore accurate systems, to the position where today's schoolscan have fully planned timetables that automatically makechanges for exams. Present day ringing the bell incolleges/schools are carried out manually [9]. The maindisadvantage of this is one person is to be keeping alert forthis. At the same time during that time he could not beengaged in another task. Of course, one further hitch of themanual bell ringing approach is the question of hearing losscaused by close proximity to the noisy bells. Thisexposurewas either unknown in the past or at least it was by no meansconsidered a significant enough issue to deserve changes tothe practice. In recent decades, several other school bell systems have beentested, some proving more functional than others [10]. Severalschools have tried using sirens and klaxons to alert studentsand teachers of period times, nevertheless these were usuallyfound to be stressful, and had an adverse effect on theconcentration ability of students. Real Time Clock Based Automatic College Bell where it replaces the Manual Switching of the Bell inCollege/school. It has an

Inbuilt Real Time Clock which tracksover the Real Time. When this time equals to the Bell Ringingtime, then the Relay for the Bell is switched ON. The BellRinging time can be edited at any time, so that it can be used atnormal class timings as well as examination timing.The Real Time Clock is displayed on LCD display. When theReal time and Bell time get equal then the Bell is switched onfor a predetermined time. These bells are equipped with theCPU which controls the bell. Embedded Based Automatic College Bell developedfor the users to control Bell system in companies or institutionsautomatically. All the bell timings and durations are predefinedand set in the microcontroller. The user can set the timingsusing a key pad. A LCD display is used to display the timings.The timings set by the user are stored in the microcontroller.At the particular time, signal is generated in themicrocontroller and sent through the output port. Theelectronic circuit receives the signal and drives acorrespondingrelay.The relay is used as a switch to operate the Bell. As soon asthe duration is over, the signal is stopped and waiting for thenext set time. This system is mainly used in Schools, Collegesand other companies where Bell system is implemented. Thereis no need of a person managing the bell timings.

III. SYSTEM MODEL

Many embedded systems have substantially different design constraints than desktop computing applications. No single characterization applies to the diverse spectrum of embedded systems. However, some combination of cost pressure, long life-cycle, real-time requirements, reliability requirements, and design culture dysfunction can make it difficult to be successful applying traditional computer design methodologies and tools to embedded applications. Embedded systems in many cases must be optimizedfor life-cycle and business-driven factors rather than for maximum computing throughput. There is currently little *tool* support for expanding embedded computer design to the scope of holistic embedded system design. However, knowing the strengths and weaknesses of current approaches can set expectations appropriately, identify risk areas to tool adopters, and suggest ways in which tool builders can meet industrial needs

A. BLOCK DIAGRAM

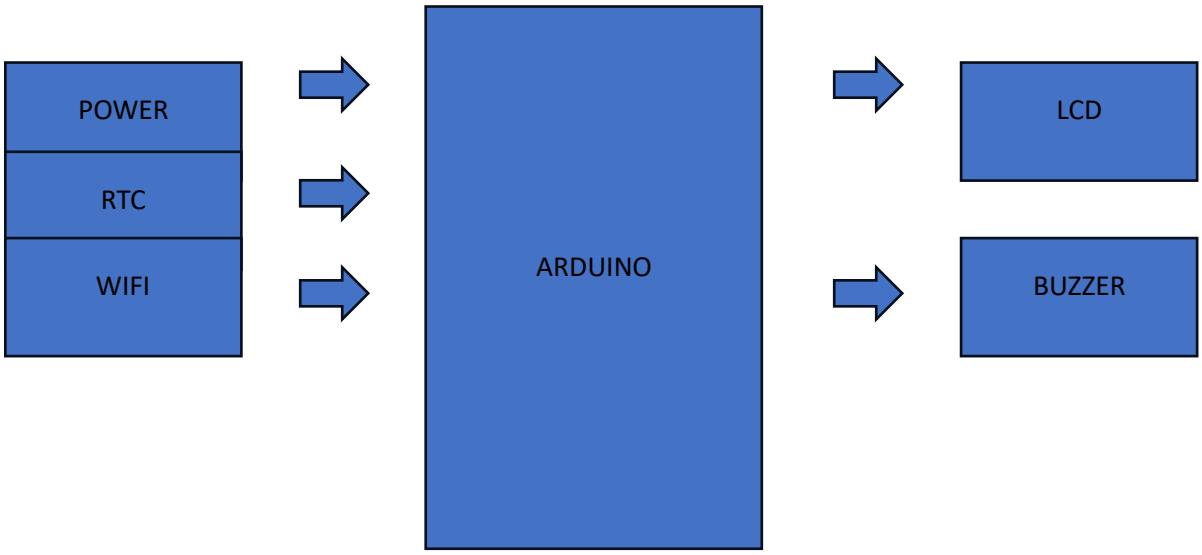

Figure 1: Block diagram of Proposed Model

If we look around us, today we see numerous appliances which we use daily, be it our refrigerator, the microwave oven, cars, PDAs etc. Most appliances today are powered by something beneath the sheath that makes them do what they do. These are tiny microprocessors, which respond to various keystrokes or inputs. These tiny microprocessors, working on basic assembly languages, are the heart of the appliances.

B. ARUDINO

The Arduino is a family of microcontroller boards to simplify electronic design, prototyping and experimenting for artists, hackers, hobbyists, but also many professionals. People use it as brains for their robots, to build new digital music instruments, or to build a system that lets your house plants tweet you when they're dry. Arduinos (we use the standard Arduino Uno) are built around an ATmegamicrocontroller — essentially a complete computer with CPU, RAM, Flash memory, and input/output pins, all on a single chip. Unlike, say, a Raspberry Pi, it's designed to attach all kinds of sensors, LEDs, small motors and speakers, servos, etc. directly to these pins, which can read in or output digital or analog voltages between 0 and 5 volts. The Arduino connects to your computer via USB, where you program it in a simple language (C/C++, similar to Java) from inside the free Arduino IDE byuploading your compiled code to the board. Once programmed, the Arduino can run with the USB link back to your computer, or stand-alone without it — no keyboard or screen needed, just power.

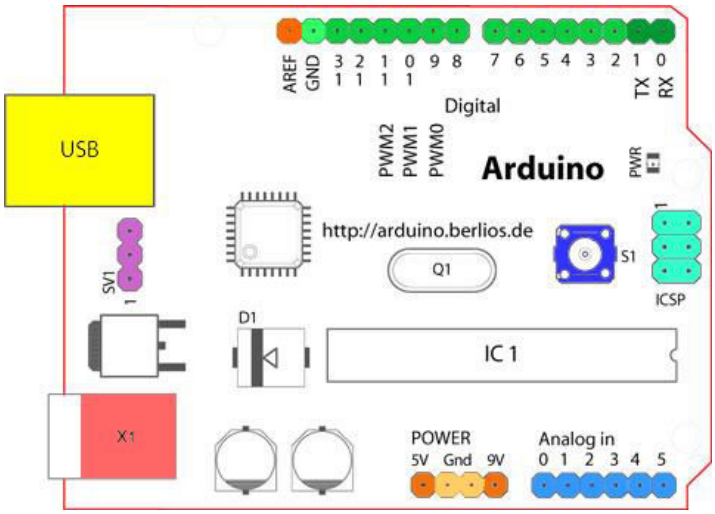

Figure 2: Structure of Arduino Board

C. LCD (Liquid Cristal Display)

A liquid crystal display (LCD) is a thin, flat display device made up of any number of color or monochrome pixels arrayed in front of a light source or reflector. Each pixel consists of a column of liquid crystal molecules suspended between two transparent electrodes, and two polarizing filters, the axes of polarity of which are perpendicular to each other. Without the liquid crystals between them, light passing through one would be blocked by the other. The liquid crystal twists the polarization of light entering one filter to allow it to pass other.

D. LED

A light-emitting diode (LED) is a semiconductor light source. LEDs are used as indicator lamps in many devices, and are increasingly used for lighting. Introduced as a practical electronic component in 1962, early LEDs emitted low-intensity red light, but modern versions are available across the visible, ultraviolet and infrared wavelengths, with very high brightness. The internal structure and parts of a led are shown below.

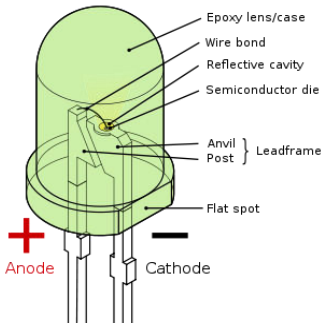

Figure 3: Inside a LED

E. SOFTWARE DESCRIPTION

The Arduino is a family of microcontroller boards to simplify electronic design, prototyping and experimenting for artists, hackers, hobbyists, but also many professionals. People use it as brains for their robots, to build new digital music instruments, or to build a system that lets your house plants tweet you when they're dry.

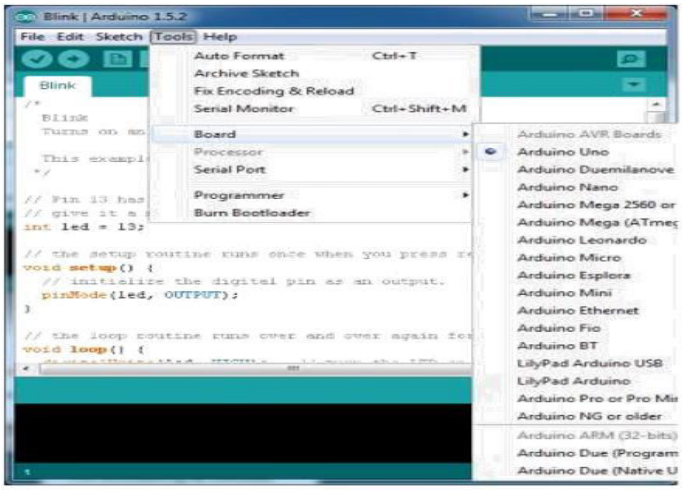

Figure 4: Arduino Software input/output

Arduinos (we use the standard Arduino Uno) are built around an ATmega microcontroller — essentially a complete computer with CPU, RAM, Flash memory, and input/output

IV. RESULT

The Bell system is successfully installed and operated as intended.The system proved to be highly accurate, with bells ringing at precise scheduled times.The administrative burden of managing bell schedules manually was significally reduced.The bell rings automatically at the correct times based on a pre-programmed schedule. Flexibility to edit schedules as required (e.g., different bell times for exams or regular class periods). Real-time clock synchronization with the DS1307 RTC ensures accurate timekeeping. The system is highly secure, with password protection to prevent unauthorized access.

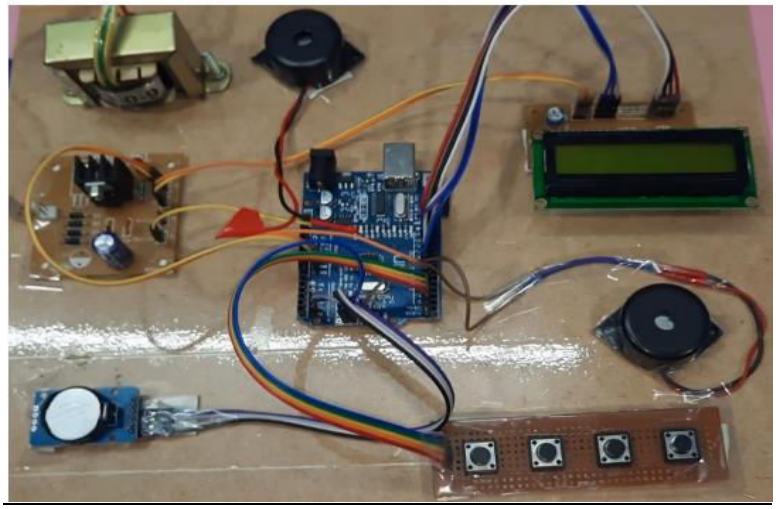

Figure 5. Circuit Schematic for Automatic College Bell System

V. CONCLUSION

The basic design of the Automatic School Bell (mainly for Primary and Secondary Schools) in this work remains the same though extra functions can be included. This will ring the School Bell at pre-scheduled times of periods on each day. There are different times per period varying from one school to the other. The basic design provides an opportunity of selecting the suitable time schedule for every school by momentarily pressing one of the push-to-on switches. This signals the microcontroller to carry out the specific task, thereby ringing the bell at a regular time interval. Therefore, from the results obtained, it can be concluded that the aim of this work has been practically and theoretically achieved.

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