Automatic College Bell and Notice Board

Mr Hemant S. Kadamdhad[1] Mr Ajay Misra[2] Mr. Pradeep Pandey[3] Miss. Vanashree Shrikhande[4] Miss. Tanvi Gaur[5]
[1]Assistant Professor [2,3,4,5]Student
[1,2,3,4,5]Department of Electronics and Telecommunication
[1,2,3,4,5]Govindrao Wanjari College of Engineering, Nagpur, India

Abstract — The require Foran programmed College Chime and Take note Board is presently a need which has been advanced with the transformation in innovation and boost within the education system where time could Bea major calculate influencing the instructive framework where the time has got to be accurate. Man control can too be spared with the utilize of Automatic college chime because it isn't to be worked physically and manpower can be spared it is additionally more precise than the manual chime frameworks. Time being a major factor in all of our lives has got to be utilized appropriately and it could be a exceptionally proficient gadget for the time administration. The college chime may be a straightforward venture executing the utilize in genuine time with its properties as a caution with Remote Take note Board. Electronic automatic bell with Wireless Notice Board system is designed for colleges. It is used to make college bells automated. We are living in the world of automated system where everything is controlled automatically and wirelessly using intelligent system like Microcontrollers and GSM. So electronic bell with Wireless Notice Board is designed to operated automatically with programmed time and GSM.

Keywords: Microcontroller, LCD Display, Keypad, Real Time Clock, Bell, GSM

I. INTRODUCTION

The ATMEGA328 may be a lower control, high-performance CMOS 8-bit microcontroller with 32k bytes of in-system programmable streak memory. The gadget is microchip fabricated tall thickness non-volatile memory innovation and is consistent with the industry standard RISC instruction set and stick out. The inbuilt streak permits the program memory to be modified in-system or by normal programming. By detached components formed in a single chip, the pic could be a capable microcontroller which gives the taking after standard highlights: 32k bytes of streak, 2K bytes of Smash, 25 I/O lines, and design, a full duplex serial harbour, on-chip oscillator, and clock circuitry. The AVR is an effortlessly accessible microcontroller with more memory than any other microcontroller. Its harbour are completely utilitarian and can be utilized with the genuine time clock without any other IC being utilized its inbuilt streak makes it simpler for the client as we don't require any outside memory for the circuit.

This framework illustrates a straightforward configuration of a circuit of programmed college chime utilizing Microcontroller which is outlined so as the chimes within the colleges are not to be worked physically and are completely programmed and once information is entered the college chime rings after a normal interim as per the software engineers require and the timing may be changed in between to incorporate breaks.it also displays time. In today€ ™s world where time is money it can be squandered on Working manual things and one of the foremost common would be school/college chime which needs to be operated hour after hour and which is additionally not exact and requires the utilize of labor this will be effortlessly overcome by employing a completely programmed framework which is worked employing a microcontroller where the college chime is worked completely programmed and doesnâ€ ™t requires any manpower and which is much more exact than the one which is worked physically. It replaces the manual exchanging of the chime within the college. Programmed college chime is pic microcontroller and a genuine time clock which is utilized for time location and is utilized to show time additionally keep track of time. It employments a lcd show which is utilized to show time it keeps track of the time and the chime is rung after legitimate interims of time. The framework can be re modified to alter any alter in time interims which may take put amid the school/college hours the break within the school/college can too be included which is of more exactness.

II. LITERATURE SURVEY

In this venture the scope is to plan a Programmed COLLEGE Chime and its execution on ARDUINO UNO BOARD. A Programmed COLLEGE Chime could be an advanced circuit that's utilized for the reason of programmed exchanging of chime as per the given plan without any human mediation. For the most part, wherever we may go, it may be a school or an organization on the off chance that begin or halt of any handle is to be passed on to a huge number of individuals, a chime is utilized over there which signals the start or halt of any process. So, all these chimes are for the most part worked by the humans directly which isn't fitting continuously because it isn't productive and indeed precision of the time is additionally being changed. So, in arrange to maintain a strategic distance from this computerization-based chime framework is to be presented. [2]. Mechanization or programmed control, is the utilize of different control frameworks for working gear such as apparatus, forms in production lines, boilers and warm treating broilers, exchanging on phone systems, directing and stabilization of ships, airplane and other applications with negligible or diminished human intercession. A few forms have been totally mechanized. The greatest advantage of mechanization is that it spares work; in any case, it is additionally utilized to spare vitality and materials and to move forward quality, exactness and exactness.

In market there many digital clocks available with bells but rings only at specific time. For e.g. Alarm Clock and some bells that ring after some time intervals and that cannot stop after specific time. For e.g. Musical Clock But all these limitations have been removed by our project. It rings only according to our college time table used at Normal Class Timings as well as Exam Times. The Real Time Clock is displayed on LCD display. The Microcontroller AT89S52 is used to control all the Functions, it get the time through the keypad and store it in its Memory. And when the Real time and Bell time get equal then the Bell is switched on for a predetermined time.

III. METHODOLOGY

A. Hardware Component:

Arduino Board - This is the central processing unit of the system that runs the code and controls the various components. It receives user input and accordingly sends signals to the relays.

Arduino UNO is a low-cost, flexible, and easy-to-use programmable open-source microcontroller board that can be integrated into a variety of electronic projects. This board can be interfaced with other Arduino boards, Arduino shields, Raspberry Pi boards and can control relays, LEDs, servos, and motors as an output.

Arduino UNO features AVR microcontroller Atmega328, 6 analogue input pins, and 14 digital I/O pins out of which 6 are used as PWM output.

This board contains a USB interface i.e. USB cable is utilized to associate the board with the computer and Arduino IDE (Coordinates Advancement Environment) program is utilized to program the board.

The unit comes with 32KB streak memory that's utilized to store the number of informational whereas the SRAM is 2KB and EEPROM is 1KB.

The working voltage of the unit is 5V which ventures the microcontroller on the board and its related circuitry works at 5V whereas the input voltage ranges between 6V to 20V and the prescribed input voltage ranges from 7V to 12V.

Do you like what you studied? Visit your profile and inclination center to select in to our DS pamphlet and never miss extraordinary tech articles again!

B. Arduino UNO Components

The Arduino UNO board contains the taking after components and specifications:

1) ATmega328: Usually the brain of the board in which the program is stored.
2) Ground Stick: there are a few ground pins joined on the board.
3) PWM: the board contains 6 PWM pins. PWM stands for Beat Width Balance, utilizing this handle able to control the speed of the servo engine, DC engine, and brightness of the LED.
4) Digital I/O Pins: there are 14 computerized (0-13) I/O pins accessible on the board that can be associated with outside electronic components.
5) Analogue Pins: there are 6 simple pins coordinates on the board. These pins can peruse the simple sensor and can change over it into a advanced signal.
6) AREF: It is an Analog Reference Stick used to set an outside reference voltage.
7) Reset Button: This button will reset the code stacked into the board. This button is valuable when the board hangs up, squeezing this button will take the complete board into an beginning state.
8) USB Interface: This interface is used to associate the board with the computer and to transfer the Arduino portrays (Arduino Program is called a Sketch)
9) DC Control Jack: This is often utilized to control up the board with a control supply.
10) Power Driven: Typically, a control Driven that lights up when the board is associated with the control source.
11) Micro SD Card: The UNO board bolsters a smaller scale SD card that permits the board to store more information.
12) 3.3V: This stick is utilized to supply 3.3V control to your projects.
13) 5V: This stick is utilized to supply 5V control to your projects.
14) VIN: It is the input voltage connected to the UNO board.
15) Voltage Controller: The voltage regulator controls the voltage that goes into the board.
16) SPI: The SPI stands for Serial Fringe Interface. Four Pins 10(SS), 11(MOSI), 12(MISO), 13(SCK) are utilized for this communication.

TX/RX: Pins TX and RX are utilized for serial communication. The TX could be a transmit stick utilized to transmit the serial information whereas RX may be a get stick utilized to get serial information

C. DOT Matrix Display

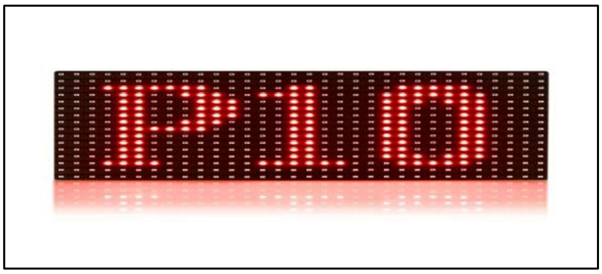
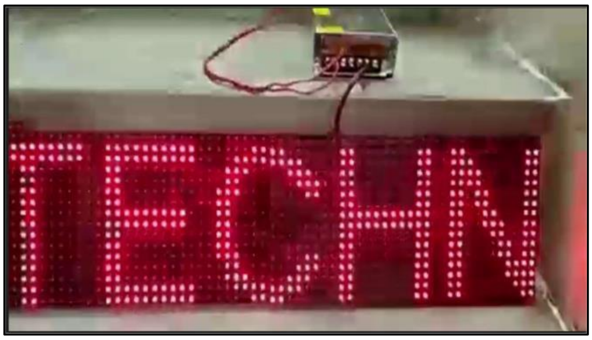
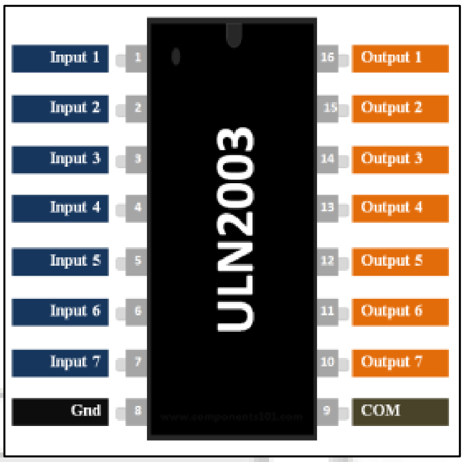


Fig. 1: DOT Matrix Display

P10 32x16 (Total 512 LEDs) LED Display module is the easiest way to put together any size of Outdoor or Indoor LED display sign board. This panel is having total 512 high brightness red led's mounted on a high quality plastic housing designed for best display results. Any number of such panels can be combined in different fashions in order to realize LED sign board/ Graphics Board of any size.

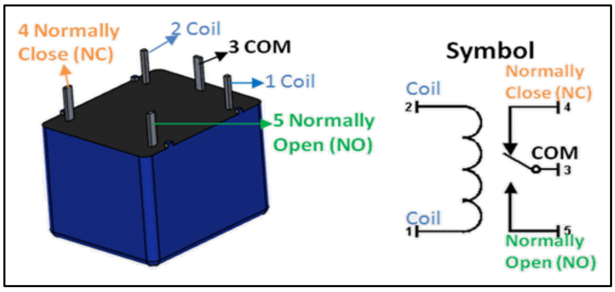


D. DRIVER IC ULN2003



ULN2003 IC is one of the foremost commonly utilized Engine driver IC. This IC comes in handy when we got to drive tall current loads utilizing advanced rationale circuits like Op-maps, Clocks, Doors, DRIVERS, PIC, ARM etc. For case a Transfer that requires 12V and 300mA to run cannot be fueled by an PIC I/O consequently we utilize this IC to source sufficient current and voltage for the stack. This IC is commonly utilized to drive Relay modules, Engines, tall current LEDs and indeed Stepper Engines. So in case you've got anything that anything more than 5V 80mA to work, at that point this IC would be the correct choice for you.

E. Relay



Relays are most commonly used switching device in electronics. There are two important parameters of relay, first is the Trigger Voltage, this is the voltage required to turn on the relay that is to change the contact from Common → NC to Common → NO. The other parameter is your Load Voltage & Current; this is the amount of voltage or current that the NC, NO or Common terminal of the relay could withstand, in our case for DC it is maximum of 30V and 10A. Make sure the load you are using falls into this range.

IV. ADVANTAGE

- Ensue that schedules are allowed pecisly and that classes,breaks and shift change in schedule.
- Provide consistent performance and reliability in ringing bell at the correct times.
- Helps in maintaining an organized and efficient school schedule.
- Reduce the need for manual bell rainging.

V. APPLICATIONS

1) It's useful for School Areas.
2) It's used in college.
3) It's helpful in education purpose

A. Software Required

Arduino UNO is simple to program and a individual with small or no specialized information can get hands-on encounter with this board. The Arduino UNO board is modified utilizing Arduino IDE program which is an official program presented by Arduino.cc to program the board. The Arduino program is called a outline which you would like to empty into the board. The outline is nothing but a set of enlightening that permit the board to perform certain capacities as per your requirements.
Each Arduino outline comes with two fundamental parts:

- void setup() â€“ this sets up the things that ought to be done once and they donâ€™t happen once more within the running program.
- void circle() â€“ this portion comes with the enlightening that get rehashed once more and once more until the board is turned off.

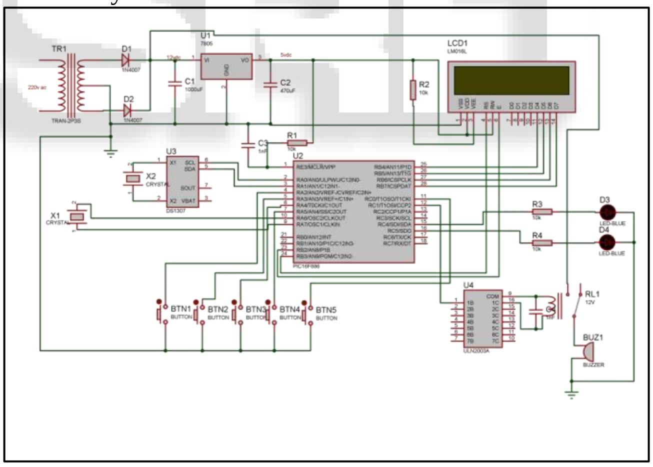
B. Automatic Electronic Bell Working

Automatic electronic bell takes over the task of ringing of the bell in the school. It replaces the Manual Switching of the Bell in the school. It has a built in Real Time Clock (DS1307) which track over the Real Time. When this time equals to the bell ringing time, then the relay for the bell is switched ON. The Bell Ringing time can be edited at any Time, so that it can be used at Normal Class Timings as well as Exam Times. The Real Time Clock is displayed on LCD which is able show date and time. The Microcontroller ATMEGA328 is used to control all the Functions, it get the time through the keypad and store it in its Memory. And when the Real time and Bell time get equal then the Bell is switched on for a predetermined time.

C. LED Matrix Display

LED-based signage and lattice shows are bringing unused measurements of flexibility and eyepleasing visual impacts to a developing number of open air and indoor applications. Later progresses in Driven innovation have indeed made it troublesome to recognize still pictures on their high-quality shows from conventional printed or painted announcements. In this instructional exercise, Texas Disobedient takes a nitty gritty see at the fundamental specialized standards of Driven show frameworks and the building contemplations required to plan them utilizing clusters of discrete Driven lights. Driven driving essentials To begin with we'll compare the various LED driving circuitries to decide the finest strategy.

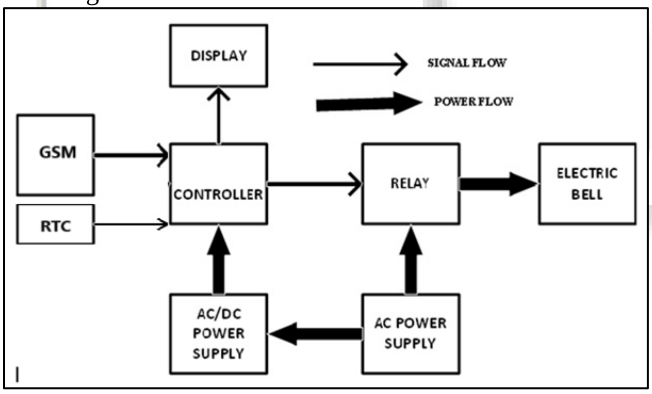
Interfacing a voltage source It is well known that an Driven light (or diode) begins turning ON with sufficient forward voltage (VF). When ON its forward current emanates light. From this fundamental knowledge, one can come up with the primary alternative in Figure 1a but it'll not work. Since an Driven current is an exponential work of its voltage predisposition (condition 1), light escalated from the Driven lamp is exceptionally touchy to the voltage. In most cases the tall current condition turns the regularly long-lived LED into a really costly streak bulb. Hereâ€ ™s why Figure 1a will not work. In condition 1, IS, RS may be a consistent, depending on the Driven item, and whether VT is the warm voltage. Accepting a arrangement resistance RS is perfect and zero, as it were 0.1V of VF alter makes 47 times contrast in ILED. For case, a target Driven current esteem 20 mA hops up to 1A with as it were 0.1V contrast of its predisposition current. Indeed taking into consideration a reasonable RS esteem, a genuine Driven gadget still appears 10 to 20 times contrast with a 0.1V inclination distinction. Figure: Comparing three Driven driver circuits Voltage source with current restrain resistor Presently letâ€ ™s look at Figure 1b. A current restrain resistor RLIMIT is included to secure an Driven light. Since of the constrain resistor, the light does not blow up. Still, it isn't extraordinary at controlling Driven light escalated in video show applications. An Driven bend and a stack bend by RLIMIT decide its Driven current esteem. As appeared in ruddy or blue explanations, this Driven and resistor has varieties of forward voltage and resistance from fabricating blunders. These blunder components alter the Driven current (green) at nonnegligible levels. Consistent current source This steady current driver circuit controls an Driven current straightforwardly at the target esteem. The Driven conducts a certain value, no matter how much VF variety the Driven light has from its fabricating handle. Since the light concentrated of an Driven lamp is strongly tied to charges crossing its PN intersection, this consistent current driver strategy is perfect to urge uniform light yield from Driven lights. Moreover, it is well known that an coordinates circuit (IC) gives great coordinating circuit sets. This is often another advantage of selecting a constant-current strategy. Figure appears a fundamental yield organize structure of Driven drivers. Numerous Driven driver ICs within the advertise have a reference current setting terminal IREF, and this reference current is constant-current-mirrored to its yield terminals. Driving in colour Hence distant, we have been able to decide how to drive an person Driven light. Another step is to attain full colour light yield for video show frameworks. By combining shifting shades of lightâ€ ™s three essential colours, ruddy, green and blue (RGB), any colour can be generated. A commonplace illustration may be a colour choice device on a individual computer (PC). Gray scale control by advanced or analog A PC's operating framework mixes three colors in 256 steps (8 double bits each) or more to show a full color pixel. For the Driven show framework, the same concept of step color escalated control is required. The objective is to realize step control, or gray scale control in Driven driver design. You to begin with choice ought to be whether to utilize computerized or analog control. As clarified prior, the overall charge check crossing a PN intersection decides light concentrated, so both digital and analog strategies can control the light concentrated. Figure 3 outlines 50 percent gray scale control in digital and analog strategies. In a add up to 256-step illustration, this 50 percent shows a 128 gray scale target. Driven current and color alter At this point, the impacts of current alter on the wavelength esteem of Driven light yield must be considered. A changing wavelength implies changing color to the human eye. Figure 4 appears a green color Driven light case. Ordinarily, 510 nm broadly speaks to green within the industry. Thus, most Driven light producers plan a light to have 510 nm at maximum-rated current of Driven light items. In Figure 4, the wavelength comes to 510 nm as the Driven current rises. perfect way">The most ideal way to urge green color is to continuously drive a light as near to its greatest appraised current as conceivable. This clarifies why utilizing advanced control is way better than analog control. Another advantage of choosing computerized control is the ease of actualizing the control on Driven driver ICs as a advanced circuit piece. For a gray scale control over a 256 step extend, computerized control costs less than analog RTC A real-time clock (RTC) is an electronic device (most often in the form of an integrated circuit) that measures the passage of time. Although the term often refers to the devices in personal computers, servers and embedded systems, RTCs are present in almost any electronic device which needs to keep accurate time of day. The term real-time clock is used to avoid confusion with ordinary hardware clocks which are only signals that govern digital electronics, and do not count time in human units. RTC should not be confused with real-time computing, which shares its three-letter acronym but does not directly relate to time of day.



Circuit diagram of automatic electronic bell

Circuit diagram of automatic electronic bell for school using ATMEGA328 microcontroller is given below. After reading above articles, circuit diagram is self-explanatory. Push button connected to port A allows you to set timing of electronic bell. When push button is pressed, electronic bell will be in time setting mode. We can adjust the time using keypad.

In the circuit shown above, we provide 220V A.C. power supply to the “Step-Down Transformer” which converts 220V A.C. into 12V A.C. (i.e. stepped down the power supply). Now this 12V A.C. is converted into 12V D.C. with the help of “Full Wave Rectifier” which consists of 2 Diodes & 2 Condensers [a filter capacitor (1000µF)]. Two different voltage levels are required for our circuit – One is 12V D.C. to operate relay switch. Second is 5V D.C. supply to operate microcontroller "AVR". For this purpose we will use voltage regulator "LM7805" which can take 8V -25V as I/P & provide 5V constant voltage. Here we have used "microchips PIC" microcontroller to control various timing of the ringing. Here we also use a "16MHz Crystal" which will provide the microcontroller a reference time. We have used "Assembly Language" to program this microcontroller and we have also used a microcontroller programmer. We have used different types of capacitors and resistors in this circuit. We have used two 33pF capacitor which are acting as a High Pass Filter [H.P.F.]. The 10KΩ resistor is used for RESET circuit to provide negative potential to RESET pin of microcontroller. We have used IC DS 1307 which is a low-power clock/calendar with 56 bytes of Battery-backed SRAM. It uses an external 32.768 kHz crystal. The oscillator circuit does not require any external resistors or capacitors to operate. The accuracy of the clock is dependent upon the accuracy of the crystal and the accuracy of the match between the capacitive load of the oscillator circuit and the capacitive load for which the crystal was trimmed. We have used Dot Matrix display for the displaying the real time lectures and Notices. Here dotmatrix display driver is used for the interfcing process. The microcontroller can operate on 5V and 10mA current maximum but we have to operate 12V relay switch which consume more than 7A current. So, we have to amplify this current and voltage, For this purpose we are using driver IC ULN2003.



Block diagram of Automatic electronic bell

Block diagram of electronic bell and wireless Notice board for college is shown above. RTC is used to set the timing of electronic bell. After reaching at set time, AVR microcontroller activates the relay for 1 minutes and electric bell start ringing for 1 minutes. After 1 minutes, microcontroller gives off signal to relay. Relay coil becomes de energize and switch off the electronic bell. DOT MATRIX display is used to display time and status of electronic bell. DS1307 real time clock is used to keep track of time. Power supply for micro controllers is designed using 7812 and 7805 voltage regulators.

1) Control SUPPLY: In this circuit, we are utilizing three supply of 5V. The 5V supply fundamentally utilized for Driven lattice show, seven section show and supply to the Microcontroller.
2) MICROCONTROLLER (ATMEGA328): A microcontroller could be a single chip that contains the processor non-volatile memory for the program, unstable memory for input and yield, a clock and an input I/O control unit.
3) REAL TIME CLOCK (DS1307): The (DS1307) serial genuine time clock could be a moo control IC .The clock/calendar gives seconds, minutes, hours, day, date, months and your data at the conclusion of the month, date is naturally balanced for months with less than 31 days .The clock works in either 24Hr or 12Hr arrange with AM/PM pointer. The DS1307 has built-in control, sense circuit that detects power failures and naturally switches to the reinforcement supply.
4) DOT Lattice show: It may be a show gadget utilized to show data of takes note, clocks, lectures and numerous other informations requiring a straightforward show gadget of constrained determination.
5) GSM: Client will send any through gsm arrange within the frame of SMS.

VI. Future Scope

As there may be numerous departments at a university at a distance on the same campus and desire to synchronize all department bells, the automatic college bell system employing lab VIEW may be expanded for further development.

This proposed system has many upcoming applications in educational institutions and organizations, crime prevention, traffic management, railways, advertisements etc.

VII. Conclusions

A programmed college chime can be effectively outlined and can be appropriate in school and colleges as per to spare labor additionally to spare time itÃ¢Â€ Â™s a fetched successful venture which can be built utilizing effortlessly accessible gear and can be utilized in real time within the school and within the colleges this will be included in each instructive institution as per the timing which can be effortlessly reconstructed by a common laymen and can also vary timing for a few classes as per the plan of the school. The show of time within the venture too increments it adequacy.

This project elaborates the drawbacks of manually operated bell ringing system and how this automatic college bell ringing system deals with these drawbacks. This automatic bell ringing system not only used for lecture schedule but we can also use it for examination purpose. We have constructively combined the college bell with RF module and LCD to display the notices. This project helps to ring the bell with high accuracy in time in all locations.

As the technology is advancing every day the display board systems are moving from Normal handwriting display to digital display. Further to Wireless display units. This project develops a wireless notice board system with Bluetooth connected to it, which displays the desired message of the user through an SMS in a most populated or crowded places. Here by introducing the concept of wireless technology in the Field of the communication. We can make our communication more efficient and faster, with greater efficiency. We can display the messages and with less errors and maintenance.

REFERENCES

[1] Naresh, p.raveendra babu, k.satyaswathi, ijsetr "mobile phone signal jammer for gsm, CDMA with coverage prescheduled time duration using arm7" , volume2, issue september 2013

[2] Ally s. Nyamawe, nixin mtonyole ijsetr, "the use of mobile phones in university exams cheating: proposed solution" volume 17 2014.

[3] Alaparthi pardhasaradhi, rayalaravi kumar jsr, India online ISSN: 2319-7064 signal jamming and its modern applications.AT89S51. 2011. Datasheet. Available:

[4] Boylestad, R.L.; and Nashelsky, L. 2007. Electronic Devices and Circuit Theory. 9th ed., Dorling Kindersley, New Delhi, India.

[5] Encyclopedia. 2011. Bell. Available:

[6] Mehta, V.K.; and Mehta, R. 2008. Principles of Electronics. 11th ed., S. Chand, Ram Nagar, New Delhi, India.

[7] Theraja, B.L.; and Theraja, A.K. 2003. A Textbook of Electrical Technology. S. Chand, Ram Nagar, New Delhi, India. [7] Wikipedia. 2011. Bell (school). Available:

[8] STM32 Microcontroller datasheet, Microchip Technologies Inc.

[9] DS1307 Real Time Clock IC Datasheet, Maxim, Dallas Semiconductors.

[10] Burgoji Santhosh Kumar, Implementation of Automatic College Bell Ringing System Using Arduino, ISSN : 2393-8374,VOLUME-5, ISSUE-4, 2018

[11] Rajesh Kannan Megalingam, VenkatKrishnan Balasubramanian,MithunMuralidharan Nair, Vineeth Sarma Venugopala SarmRahulSrikumar: Power Aware AutomaticMicrocontroller Based Smart, College Electric Bell System with Time Display, 2009FifthInternationalConference on MEMS NANO, and Smart System

[12] Nalini,Naveen Raj,Sharwanjana, Satish Kumar and Vijay :IOT based wireless automated bell ringing system in an institution,international journal of creative research thoughts(IJCRT)

[13] "Microcontroller Controlled Automated College Bell", International Journal of Engineering Trends and Technology (IJETT), Volume 32, Issue 4, Pages 184-187, February 2016.

[14] Burgoji Santhosh Kumar, Implementation Of Automatic College Bell Ringing System Using Arduino, ISSN: 2393-8374,VOLUME-5, ISSUE-4, 2018.

[15] Hardik Gupta, Puja Shukla, Ankita Nagwekar, GSM based LED Scrolling Board: IJSRT, Vol 1 (3), ISBN [978-9383006-01-4], May 2013.

[16] Mrs. S.P. Gaikwad, Manikeshwari Shahdeo, Meghna Priya, Prashant Kr. Raghav, Wireless GSM Based Electronic Notice Board, May 2017

[17] Rajesh Kannan Megalingam, Venkat Krishnan Balasubramanian, Mithun Muralidharan Nair, Vineeth Sarma Venugopala Sarma, Rahul Srikumar: Power Aware Automatic Microcontroller Based Smart, College Electric Bell System with Time Display, 2009 Fifth International Conference on MEMS NANO, and Smart Systems

[18] Shweta Butoliya, Nupur Shal, Snehal Girhepunje, Aakanksha Rannaware, Prerna Baddalwar and Vaishali Badwe," Microcontroller based automatic college bell with monitoring system", International Journal of Advanced Research in Computer Engineering & Technology (IJARCET), Volume 4, Issue 2, Pages 401-404, February 2015.