# Smart Classroom System with IoT

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*Abstract*—**Entering attendance is mandatory for every education system. Nowadays some universities are monitoring the attendance of students with aid of google forms. The consult faculties of the subject are asked to fill the google form after their respective class as per the scheduled timetable. This idea can be used to reduce the time consumption to fill the google form by the teachers. In this paper, also introduce the wiper board and automatic fan, and light control. Writing on a board is a very attractive way to teach students, but dusting the board may cause some allergic issues to lecturers while using the blackboard and it also consumes 5-10 min to rub the white or blackboard. If we use a wiper, or board it may reduce the board cleaning time so that it can be well utilized for the students. Electricity is very essential to humans so it's human's responsibility to save electricity. This paper also concentrates on automatic light and fan on-off control to save electricity.**

*Keywords— Google form, Wiper board, Automatic fan, and light control, Electricity.*

## I. INTRODUCTION

All the institutions follow a formal way of taking attendance in class. This technology made it easy for the lectures just by entering a student count using the keypad. This data will be updated to the higher authority by using an IoT system. The most important whiteboard System in the field of educational is the basis of this paper, its aim is to reduce the work of lecturers to clean the board. The smart classroom system controls the automatic ON/OFF of the air conditioning system and lighting system based on the presence and absence of the person within the classroom. Smart classrooms using IOT is having various advantages in monitoring student performance and also gathering information about student and teacher academic records. The proposed system cleans the board's academic records. The proposed system cleans the board with the operated switch and controls the on and off of the light and fan based on the presence of the person in the classroom.

## II. RELATED WORK

[1] The automated systems however entail horizontal and vertical motion of the cleaning tool which spans across the board writing area. With the electronic boards which employs a unique writing mechanism, they incorporate a resistive layer extended over an inflexible substrate, an electronic module for defining instrument position i.e. pen and computer to process and store pen coordinates over the board

[2] This paper presents the design and construction of a motorized sensing whiteboard that aims at making teaching efficient and reducing human efforts. The system consists of five basic units: - Flexible whiteboard surface material, microcontroller and sensor unit, dusters, plastic rollers, and motors.

[3] The aim of the project is to create a control-based model that counts the number of people entering the room and illuminates the room based on the light of the room and turns on the fan automatically where the people are sitting inside the room. It is designed to prevent unwanted power in colleges, apartments, etc. The whole process is automated using its sensors

[4] Michele Mango et al. proposed a low-cost, wireless, sensor-based based smart lighting system that makes use of PIR sensors and motion sensors. It helps to control light intensity and energy consumption.
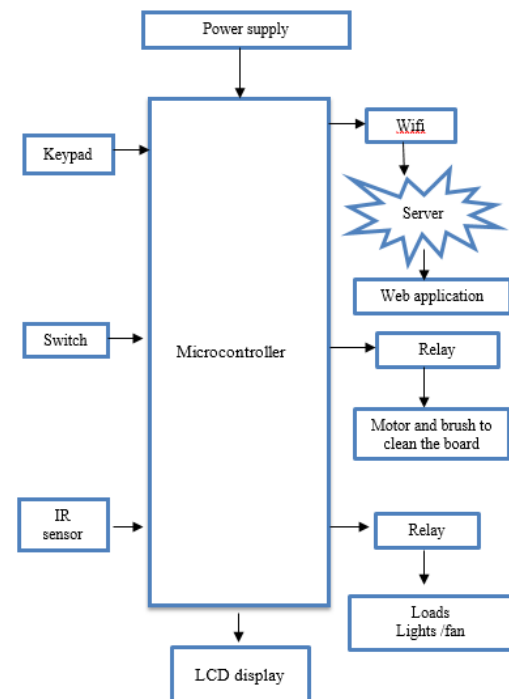
## III. BLOCK DIAGRAM



Figure 1:Block diagram

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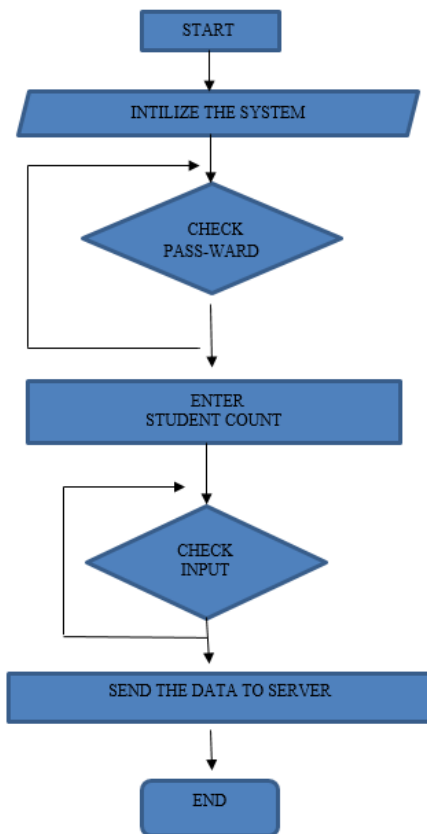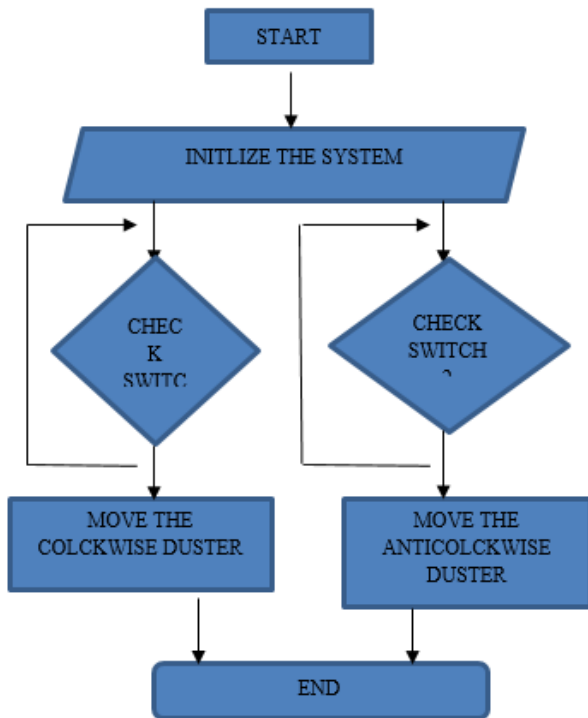
## IV. FLOW CHART



Figure 2: Attendance system
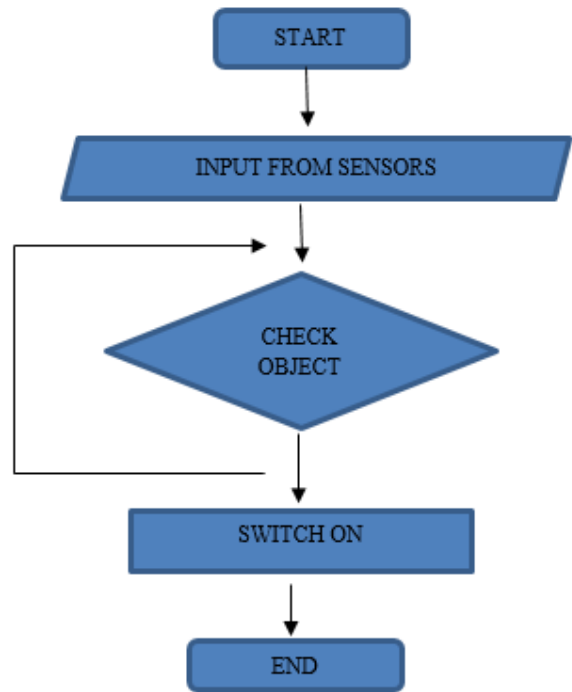


Figure 3: Wiper board system



Figure 4: Automatic fan and light control system

## V. WORKING

The microcontroller takes in output from the teacher by keypad for attendance of the students and which subject is taken, the data is uploaded to the web application adafruit io, and the access of the web application is given to HOD as shown in the figure 2. The data like the number of students present and respective teacher data will be given and monitored.

The whiteboard cleaning mechanism is done by using a motor clockwise anti-clock mechanism to clean the whiteboard as shown in the figure 3. the switch is given to control the direction of the motor to clean. There are 2 switches used in this system, when switch 1 is on motor run clockwise so the duster moves forward and when switch 2 is pressed motor run anticlockwise so the duster moves backward.

The person detection is done by the sensor to control the light and fan. If the person is detected in the classroom then the fan and light will be ON, if no motion or person is not found the fan and light will remain off as shown in figure 4.

## VI. APPLICATIONS

- In Schools and Colleges.
- Fan and Light Control system-Some industries, homes, and other sectors.
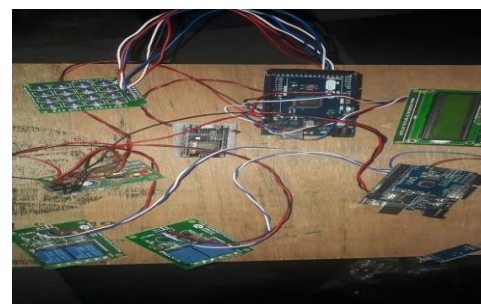
RESULT



Figure 5: Hardware connection

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When the lecturer enters the password using a keypad LCD displays the respective name & subject after they enter the number the data will upload to the higher authority



Figure 6: White board system

When the switch is ON the duster moves horizontally through motor mechanism and erases the whiteboard with the help of a duster attached to it.

## VII. CONCLUSION

Based on the results of the tests performed , it can be concluded that, when the teacher enters the classroom, they enter the password by using a keypad, then the faculty name, subject name, and time of subject taken are displayed on the LCD. And also display "Enters the total student count". After they take attendance lectures enter the number in the keypad then this data will be updated to the higher authority using the IoT system.

The automatic whiteboard cleaning machine was designed and engineered using a low-cost and easy user interface. This machine can be used in classrooms to help teachers keep their whiteboards clean.

The lights and fans can work well. The lights and fan can turn on automatically when the sensor detects a person and the lights and fans can also turn off automatically when the sensor detects non is there in the classroom.

## ACKNOWLEDGMENT

## REFERENCES

[1] M. Northcote, P. Mildenhall, L. Marshall, and P. Swan, "Interactive whiteboards: Interactive or just whiteboards" Australas. J.

[2] Educ. Technol., 2010, doi: 10.14742/ajet.1067.Bhushan Tukaram Chougule Puneet Math, "Automated Motorized Sensing Whiteboard", International Journal of Advanced Research in Engineering And Technology (IJARET), ISSN 0976–6480(Print), ISSN 0976 – 6499(Online) Volume 5, Issue 3, March (2014), Pp. 155-163

[3] Automatic room light intensity detection and control using a microprocessor and light sensors, Ying-Wen Bai; Dept. of Electron.

[4] Eng., Fu-Jen Catholic Univ., Taipei; Yi-Te Ku.

[5] Michale Mango, Tommaso Poloneli, Luca Benini "A Low Cost, Highly Scalable Wireless Sensor Network Solution to Achieve Smart LED Light Control for Green Buildings" IEEE Sensors Journal, vol. 15, no. 5, May 2015

[6] Tradesado Jacob, "A Remote Controlled Motorized White Board Cleaner", AU J.T. 15(4): 273-280 (Apr. 2012), Nigeria [4] Michale Mango, Tommaso Poloneli, Luca Benini "A Low Cost, Highly Scalable Wireless Sensor Network

[7] Puneet Mathur, Bhushan Tukaram Chougule, Ravina Nangare, "Automated Motorized Whiteboard", International Journal of Engineering, Business And Enterprise Applications (IJEBEA), ISSN (Print): 2279- 0020, ISSN (Online): 2279-0039, 6(1), September November., 2013, Pp. 01-04

[8] Daugman, J. G. (1994). U.S. Patent No. 5,291,560. Washington, DC: U.S. Patent and Trademark Office

[9] "Indian Energy Sector- An Overview", Available fromhttp://www.indiaenergyportal.org/overview_detail.php

[10] A. Maslekar, K. Aparna, K. Mamatha and T.Shivakumara, "Smart Lighting System using Raspberry Pi", International Journal of Innovative Research in Science and Technology, Vol.4(7), 2015, pp.5113-5121

[11] "Automatics Room Light Controller with Visitor Counter", Available from http://www.projectsof8051.com/automaticroom-light-controller-with-visitor-counter

[12] "Occupancy and Vacancy Sensors", Available from http://www.womackelectric.com/wpcontent/uploads/2011/05/PS-Occupancy-and-Vacancy-Sensors-Catalog.pdf

[13] Widyaningrum V.T. (2016), "Automatic Street Lighting Prototype Using LDR Sensor Based Microcontroller", National Conference on Applied Technology (SNTT 2016), Sekolah Vokasi Universitas Gadjah Mada, pp. 700 – 7003, Yogyakarta

[14] Simolowo, O., and Ngana, O. (2014). Preliminary design of an automated whiteboard cleaner. African Research Review, 8(2), 68. doi:10.4314/arrive.v8i2.5 Slocum, A. (2008). Fundamentals of Design: Power Transmission Elements

[15] Souhila, B, and Khadidja, M. M. (2013). We need change! The interactive whiteboard in the EFL context. Academic Journal of Interdisciplinary Studies. doi:10.5901/ajis.2013.v2n3p379

[16] B. Roisin M. Bodart A. Denyer, P.D Herdt, Lighting energy savings in offices using different control systems and their real consumption. Energy and buildings