Smart Auditorium System

Md.Saiful Islam*, Joyshree Sarkar†, Abubakkar Hridoy‡,
United International University, Dhaka, Bangladesh
011181292*, 011181169†, 011192127‡

***Abstract*—The main objective of this project is to design and use energy savings in public places in general such as auditoriums, shopping malls and theaters, etc. To control and monitor all these equipment's or devices, we need manpower or control system. This project describes the intelligent operation of electrical and electronic devices with automatic control using the Arduino controller. For security reasons, a binary password is used which is placed on the front door and turns on the air conditioning and the light in the auditorium. Energy savings are achieved by controlling the air conditioning according to the temperature and seating arrangement in the auditorium. We control the food service system which automatically serves the food. We make a system that gives the water level signal. All of these processes were accomplished using very little electrical power.**

***Index Terms*—Arduino, Ultrasonic Sensor, RFID, Binary Password,servo motor**

I. Introduction

The 21st century strives to save electrical energy. lights are essential, but expensive, so the system needs to be optimized to be affordable and energy efficient. Manual control of lights is a long and tedious process. We mainly adopt this concept. fillip all the time, but now auditorium max turns on the lights everywhere, which is unnecessary and just a waste of energy. On the other hand, sometimes the organizer serves food to the participants. You need manpower to serve but if a system makes it easy then you will save time and manpower. Finally, we come for the water. We don't know when the water will be finished, if you want to know the water level, you will do this job manually. But what if the water level gives us a signal? In this project, we work for the entirety of this problem statement.

II. Literature Review

There are many projects undertaken for the intelligent control of electrical equipment in public places such as shopping malls, theaters, etc. Various technologies have been used to implement it, keeping energy saving as the main motto. Here are the few projects that used a micro controller as a similar base to our project.

1.Smart Auditorium with Security System:

The "Smart Auditorium with Security System" project mainly focuses on directing a person to the desired seating arrangement, divided into blocks, as well as checking electrical systems. The main objective is to reduce energy waste caused by the unnecessary work of electrical systems when the auditorium is not full. It also shows the number of people seated using sensors at the entrance and exit doors. The guidance system is activated only when the entry sensor detects the entry of a person. When a particular row is filled, the LED corresponding to that row turns off permanently. The fan speed is controlled by the temperature sensor placed inside the auditorium, which is automatic in nature. The metal detector is placed at the entrance of the auditorium to ensure security.

2.Smart Auditorium: Development and Analysis of a Power and Environment Monitoring Platform

The Internet of Things (IoT) is used in many smart city cases. For the purposes of this article, we use a flexible platform developed by IoT using Lora communication applied in a university classroom to try to find patterns and/or anomalies in power consumption and indoor temperature. The platform allows stakeholders to track the energy consumption of lighting, (heating, ventilation and air conditioning) and electrical outlets, as well as temperature monitoring to generate reports on performance, thermal insulation and behavior. Based on the information received.

3.An open source and low-cost Smart Auditorium

A number of projects have been carried out to control smart electrical devices in public places such as shopping malls, theaters, etc.They Proposed a solution to monitor and control all equipment and energy saved in public places such as auditoriums, shopping malls, and theaters, etc. This solution is based on the Arduino micro controller for automatic control of electrical and electronic devices. To ensure security, a metal detector is placed at each door in the auditorium. Its system uses a micro controller from the MCS 51 family, IR/LDR (Light Dependent Resistor) sensors, a 16x2 LCD screen (Liquid Crystal Display) to show the values sent by the sensors. When a fire is detected, an alarm is triggered.system for energy consumption analysis in meeting rooms/auditoriums by developing a visitor desk and automatic fan control system proposed a solution that offers a smart way to control electrical and electronic devices to save energy in auditoriums, shopping malls, and theaters, etc.

4.Smart Auditorium with Security System

The project "Intelligent audience with security system" is mainly a in the individually required seats, which are also divided into blocks electrical installation inspection. The primary goal is to reduce energy waste when the auditorium is not full due to unnecessary electricity usage armature. It also shows the number of people sitting at the entry and exit gates using sensors. The control system starts working only when a person detected by the input sensor. If a particular row is full, the corresponding LED lights up turn it off for good. Temperature sensor inside the auditorium for control

fan speed. A metal detector is located at the entrance to the auditorium for security Safety

III. Project Overview

In this project we identify some of project and Mention the features here:

- Identification the authorization and open the Auditorium door also initially turn ON the front side light and all AC.
- Automatic Light turn on and off function and AC temperature control.
- Automatic water refill system and water level detector.
- Automatic food Serve system and check authentication.

IV. Component List

For this project we select the item which we used and it will working properly.The components list given below.

1) Servo Motor
2) RFID
3) DC Motor
4) Ultrasonic Sensor
5) Binary Password

A. Ultrasonic Sensor

In order for ultrasonic sensors to work, the sound wave must be sent above the range of human hearing. The transducer acts as a microphone to receive and transmit ultrasonic sounds. Like many others, our ultrasonic sensors use a single sensor to transmit the pulse and receive the echo. By monitoring the time between the transmission and reception of the ultrasonic pulse, the sensor can calculate the distance to the target.

Fig. 1. ultrasonic sensor

B. Servo Motor

Servo motors are great devices that can rotate in a specific position.They usually have a servo arm that can rotate 180 degrees. Using Arduino, we can tell a servo to go to a specific location and will go there.In our design we only use 90 degrees. Here we will see how to connect a servomotor and then how to rotate it in different positions. The first motor I connected to an Arduino seven years ago was a servo motor. The nostalgic moment is over, back to work!

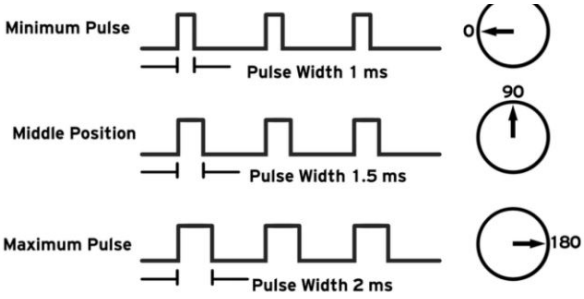

Fig. 2. Servo Clock Cycle

C. Binary Password

This project as the name suggests is a counter that simply counts from zero to fifteen while representing them in 8-4-2-1 code or BINARY code. Each LED lights up to show the position value, and by adding all the individual digits in the lit LEDs, the corresponding number in decimal can be found. Not clear yet? Take a look at this table for more clarity.

So the leftmost LED (green) is the one that represents the number 1, the RED LED represents the number 2, the yellow represents 4 and the BLUE represents 8. So to represent a number 5 we need to turn on the green and yellow LED (1 + 4 = 5). Now take control!

D. RF-ID

We will be using RF-ID here. As we know, RF-ID is the technology that works on radio frequency and it is used for the auto-identification for the different object. The RF-ID system mainly consists of two parts.

1) RF-ID Reader or Interrogator
2) RF-ID Tags

In this RF-ID system, this RF-ID reader continuously emits radio waves of a certain frequency. If the object to which this RF-ID tag is attached is within range of these radio waves, it will send feedback to this RF-ID reader. And based on this feedback, the RF ID reader identifies the object.

RF-ID tags:

Now, three different kinds of RF-ID tags are commercially available.

1) Passive tags
2) Active tags

3) Semi-passive tags

These passive tags do not have a power supply. They were fed by an incoming radio. waves of readers. Although active tags have a power supply for their internal circuitry. He also uses his power to send a response to the reader. In the case of semi-passive tags, they have an internal power circuit, but the response is sent by radio waves received from the reader.

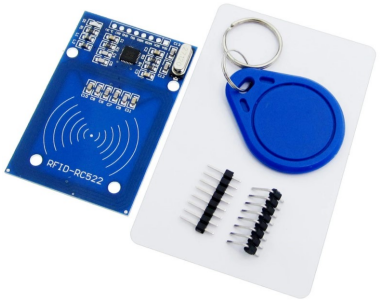

Fig. 3. RF ID and Tag

E. DC Motor

Any rotating electrical device that converts DC electrical energy into mechanical energy is called a ”DC motor”. DC motors can vary in size and power, from small motors in toys and appliances to huge machines that power steel mills, forklifts and elevators. and as a DC are the engines working? The stator and the armature are the two main parts of a DC motor. The armature of the motor rotates while the stator remains stationary. The stator of a DC motor creates a rotating magnetic field that causes the armature to rotate. A simple DC motor generates current using a coil of wire through which the current flows and a set of stationary magnets in the stator.

Fig. 4. DC Motor

V. System Flowchart

In our project Smart Auditorium we make a full system flowchart where clearly identify and understand the full system of our project.

This System Flowchart given bellow:

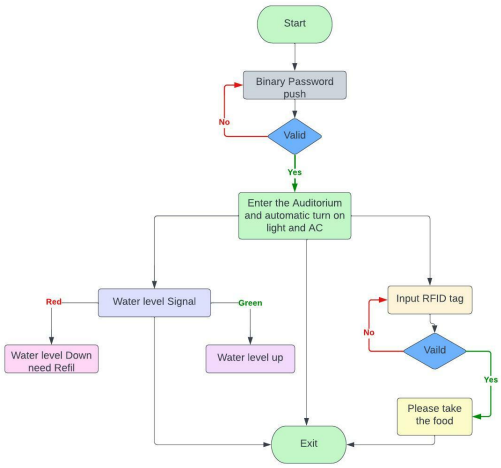

Fig. 5. System Flowchart

VI. Result and Visualization

In our project Smart Auditorium we make this this project and given output

This project Visualization given bellow:

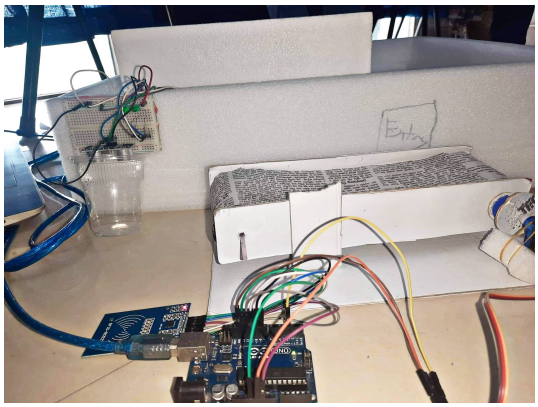

Fig. 6. Visualization

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