



SMART OFFICE AUTOMATION SYSTEM USING OCCUPANCY SENSOR :AN EFFICIENT EMPLOYEE DATABASE MANAGEMENT SYSTEM

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Abstract : Smart system implementations that are interactive, inventive, and automated are the outcome of the current IoT trends and improvements. The study suggests a smart office automation system that uses an effective database system, IoT, and connected sensor networks to foster a work environment that is welcoming to employees. An effective motion-detecting sensor used to automatically operate appliances is the occupancy sensor. Infrared, ultrasonic, microwave, and other technologies are used by these sensors. Unlike a simple PIR sensor, which just indicates whether a region is occupied or not, this sensor allows us to precisely determine the number of individuals present within a meeting room. It provides us with precise occupancy statistics in real time and notifies us when a specific room's occupancy restriction is met. The range at which it can effectively detect both large and little movements is what determines its sensitivity. The system uses the aforementioned four sensors because meeting rooms require high precision data; in a huge meeting room hall, they would not yield the necessary result.

IndexTerms - Component,formatting,style,styling,insert.

INTRODUCTION

The modern workplace environment can be dull and unwelcoming, which deters workers' enthusiasm and vitality. Productivity and creativity may suffer as a result. One important factor that must be taken into account in the workplace is the well-being of the employees. Beyond physical health, employee well-being encompasses social, emotional, financial, professional, community, and purpose aspects of life. Prioritizing employee well-being has several advantages for businesses, such as increased output, increased profitability, less employee attrition, and fewer safety accidents. An automated smart office system that fosters a friendly work environment can be developed through the integration of IoT, networked sensors, and an efficient database system. The application of interactive, creative, and automated smart system trends can help achieve this. Motion-detecting sensors, including occupancy sensors that use microwave, ultrasonic, infrared, and other technologies, can be used to activate appliances automatically, which improves user experience and efficiency in office settings. The well-being of employees can also be enhanced by smart workplace solutions. For instance, occupancy and daylight sensors allow smart lighting systems to be lowered for energy and cost savings. These systems can also be programmed to affect staff morale and productivity. Eye strain, headaches, and weariness can be lessened with the use of temperature control systems that maintain a temperature between 68 and 72 degrees Fahrenheit (20 and 22 degrees Celsius). In addition to promoting social distancing and offering real-time hot desk occupancy status and queue management, smart office sensors can also lower employee frustration and increase staff satisfaction. To sum up, the work environment has a significant impact on the productivity and well-being of employees. Employers may increase overall productivity and employee happiness by putting smart office technologies into practice and giving staff well-being first priority. Companies may draw and keep top people by fostering an environment that is cozy, productive, and globally connected, which eventually boosts the company's bottom line. The total office experience is improved by the Smart Office Automation System, in addition to the obvious advantages of resource efficiency. An workplace that is sensitive to their needs and individualized for them makes work more pleasant and enjoyable for employees. This has a good effect on well-being and productivity in addition to raising work satisfaction. In conclusion, occupancy sensors—which are essential Internet of things components—power the Smart Office Automation System, which is a game-changer for workplace dynamics. This ground-breaking system heralds a new era where the fusion of physical and digital realms leads to unprecedented levels of efficiency and user satisfaction, as organizations increasingly realize the importance of creating agile, intelligent, and sustainable workspaces.

NEED OF THE STUDY.

Smart system implementations that are interactive, inventive, and automated are the outcome of the current IoT trends and improvements. The study suggests a smart office automation system that uses an effective database system, IoT, and connected sensor networks to foster a work environment that is welcoming to employees. An effective motion-detecting sensor used to automatically operate appliances is the occupancy sensor. Infrared, ultrasonic, microwave, and other technologies are used by these sensors. Unlike a simple PIR sensor, which just indicates whether a region is occupied or not, this sensor allows us to precisely determine the number of individuals present within a meeting room. It provides us with precise occupancy statistics in real time and notifies us when a specific room's occupancy restriction is met. The range at which it can effectively detect both large and little movements is what determines its sensitivity. The system uses the aforementioned four sensors because meeting rooms require high precision data; in a huge meeting room hall, they would not yield the necessary result.

3.1 Population and Sample

KSE-100 index is an index of 100 companies selected from 580 companies on the basis of sector leading and market capitalization. It represents almost 80% weight of the total market capitalization of KSE. It reflects different sector company's performance and productivity. It is the performance indicator or benchmark of all listed companies of KSE. So it can be regarded as universe of the study. Non-financial firms listed at KSE-100 Index (74 companies according to the page of KSE visited on 20.5.2015) are treated as universe of the study and the study have selected sample from these companies.

The study comprised of non-financial companies listed at KSE-100 Index and 30 actively traded companies are selected on the bases of market capitalization. And 2015 is taken as base year for KSE-100 index.

3.2 Data and Sources of Data

For this study secondary data has been collected. From the website of KSE the monthly stock prices for the sample firms are obtained from Jan 2010 to Dec 2014. And from the website of SBP the data for the macroeconomic variables are collected for the period of five years. The time series monthly data is collected on stock prices for sample firms and relative macroeconomic variables for the period of 5 years. The data collection period is ranging from January 2010 to Dec 2014. Monthly prices of KSE - 100 Index is taken from yahoo finance.

3.3 Theoretical framework

Variables of the study contains dependent and independent variable. The study used pre-specified method for the selection of variables. The study used the Stock returns are as dependent variable. From the share price of the firm the Stock returns are calculated. Rate of a stock salable at stock market is known as stock price.

RESEARCH METHODOLOGY

3.1 HARDWARE SPECIFICATIONS:

ARDUINO UNO R3:

An ATmega328P-based micro-controller board is the Arduino UNO. It features a 16 MHz ceramic resonator, 6 analog inputs, 14 digital input/output pins (six of which can be used as PWM outputs), a USB port, a power jack, an ICSP header, and a reset button.



OCCUPANCY SENSORS:

An apparatus that uses ultrasonic sound waves to gauge an object's distance is called an ultrasonic sensor. An ultrasonic sensor transmits and receives ultrasonic pulses using a transducer to determine the proximity of an item.



JUMPER WIRES:

Often used to link the parts of a breadboard, a jump wire (also called a jumper, jumper wire, or DuPont wire) is an electrical wire, or set of them in a cable, with a connector or pin at each end (or occasionally without them – just "tinned").

LED(RED AND GREEN) :

When current passes through a light-emitting diode, a semiconductor device, light is released.

RESISTORS:

A resistor is a passive electrical component with two terminals that is used to implement electrical resistance in circuits.

BREADBOARD:

It has an array of sockets that are used to connect the leads of circuit components, making it a useful device for fast prototyping or modifying circuits. Breadboards are available in different sizes, based on the number of tie points, and can be used to connect signal and power connections in breadboarding experiments.

3.2 SOFTWARE SPECIFICATIONS:

a) FRONT-END PART:

- **HTML(Hyper-Text Markup Language)**
- **CSS(Cascading Style Sheets)**
- **JAVASCRIPT**

b) BACK-END PART:

- **PHP**
- **MYSQL**
- **XAMPP CONTROL PANEL**

c) IOT PART:

- **ARDUINO IDE**

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. This software can be used with any Arduino board.

- **NODE RED**

Node-RED is a flow-based, low-code development tool for visual programming

OUTCOMES

- **CONTINUOUS MONITORING OF OCCUPANCY:** By installing occupancy sensors, it is possible to follow employees whereabouts in the workplace in real time.
- **OPTIMAL USAGE OF WORKSPACE:** Utilizing occupancy sensor data, workspace layout and utilization can be optimized to ensure effective use of office resources.
- **MAKING DECISIONS BASED ON DATA:** Management may make well-informed judgments about future expansions, office layout modifications, and the amount of space needed for offices by analyzing occupancy statistics over time.
- **ENHANCED SAFETY:** The utilization of occupancy sensors can enhance building security by detecting and notifying authorities of any atypical or unapproved movements within the workspace.

IV. OUTCOMES

- **CONTINUOUS MONITORING OF OCCUPANCY:** By installing occupancy sensors, it is possible to follow employees whereabouts in the workplace in real time.
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- **ENHANCED SAFETY:** The utilization of occupancy sensors can enhance building security by detecting and notifying authorities of any atypical or unapproved movements within the workspace.
- **IMPROVED WORKPLACE EXPERIENCE:** The incorporation of Internet of Things occupancy sensors has the potential to enhance the contemporary and technologically accessible work setting, hence improving the entire work experience of employees.
- **SCALABILITY:** In order to provide adaptation to changing organizational demands, the solution may be quickly expanded to match changes in the size of the workforce or office layout.
- **CONNECTIVITY WITH DIFFERENT SYSTEMS:** For a more complete organizational solution, the project may be developed to interact with additional systems like security, facility management, and human resources.

- **INCREASING WORKER PRODUCTIVITY:** Organizations may build an atmosphere that increases employee happiness and productivity by knowing how different sections of the workplace are used.

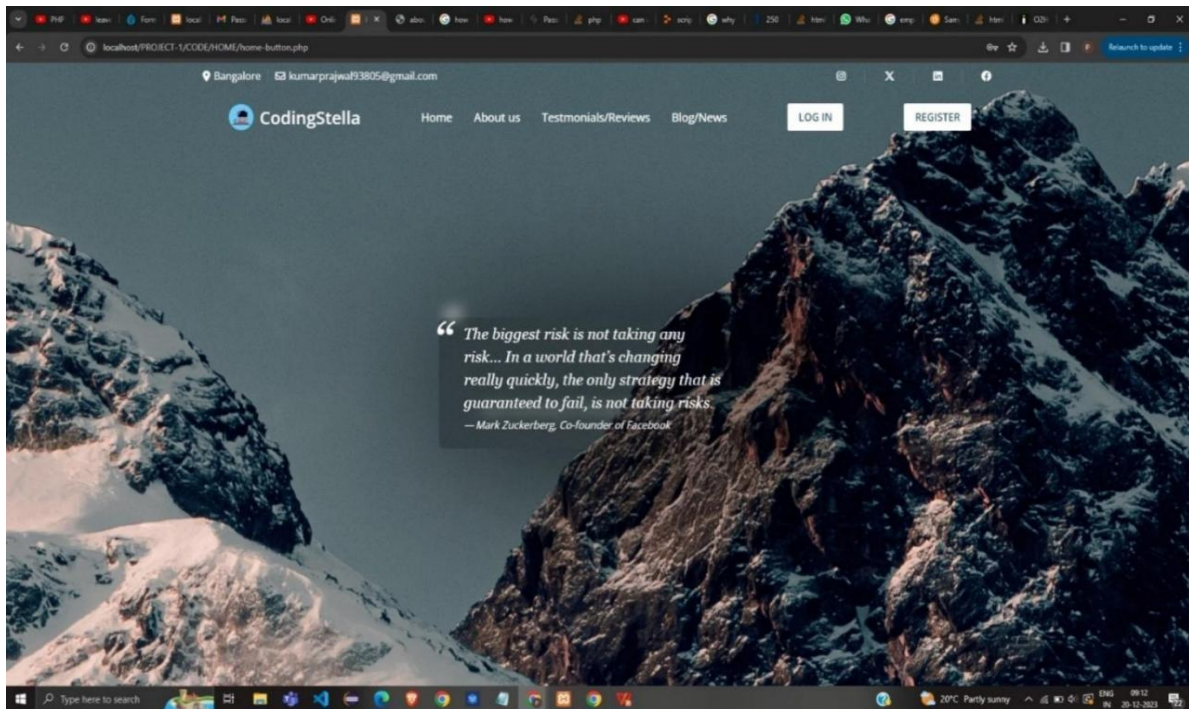


Figure 8.1: Home Page

This is a Page where the employee of that company Registers or Logins(Both Admin and employee)

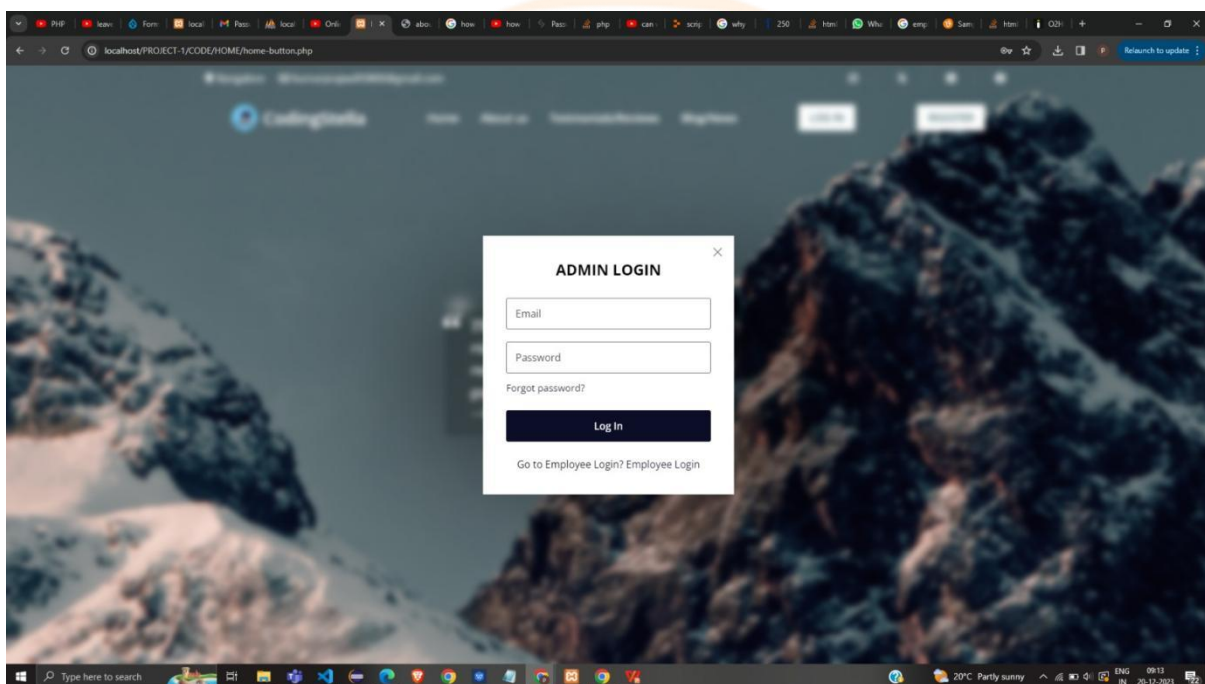


Figure 8.2: Admin Login
Page which is completely dedicated for Admin

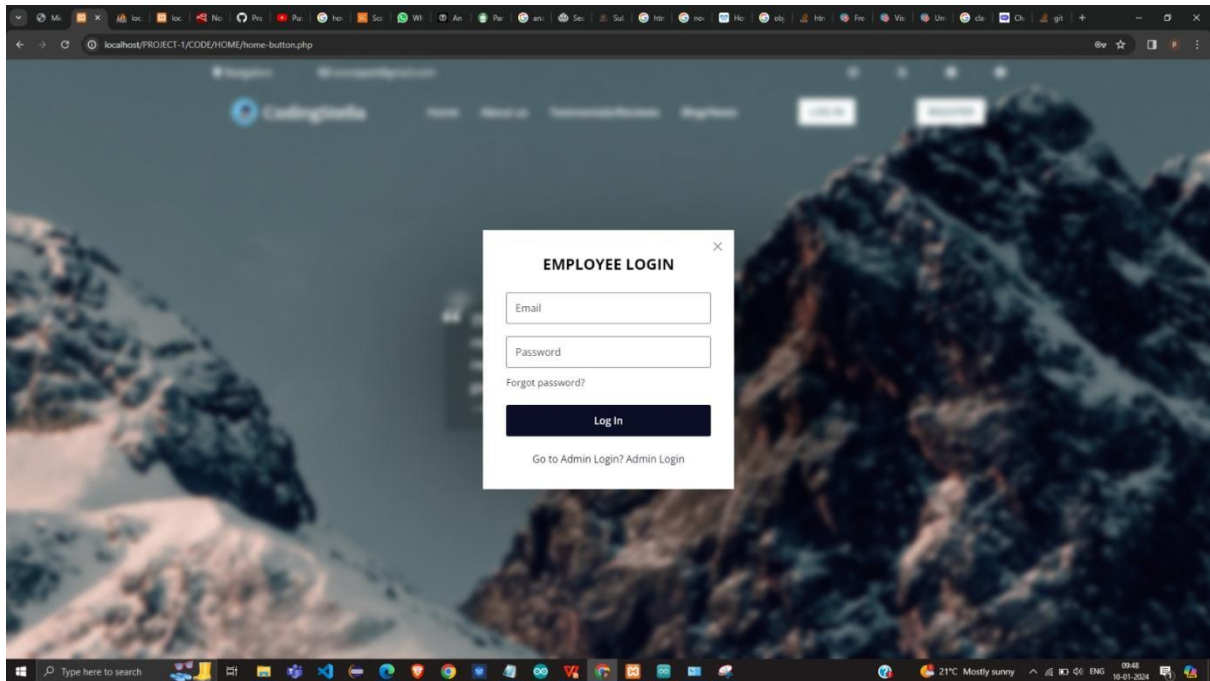


Figure 8.3: Employee Login
Page which is for Employee who is already Registered and now going to Login

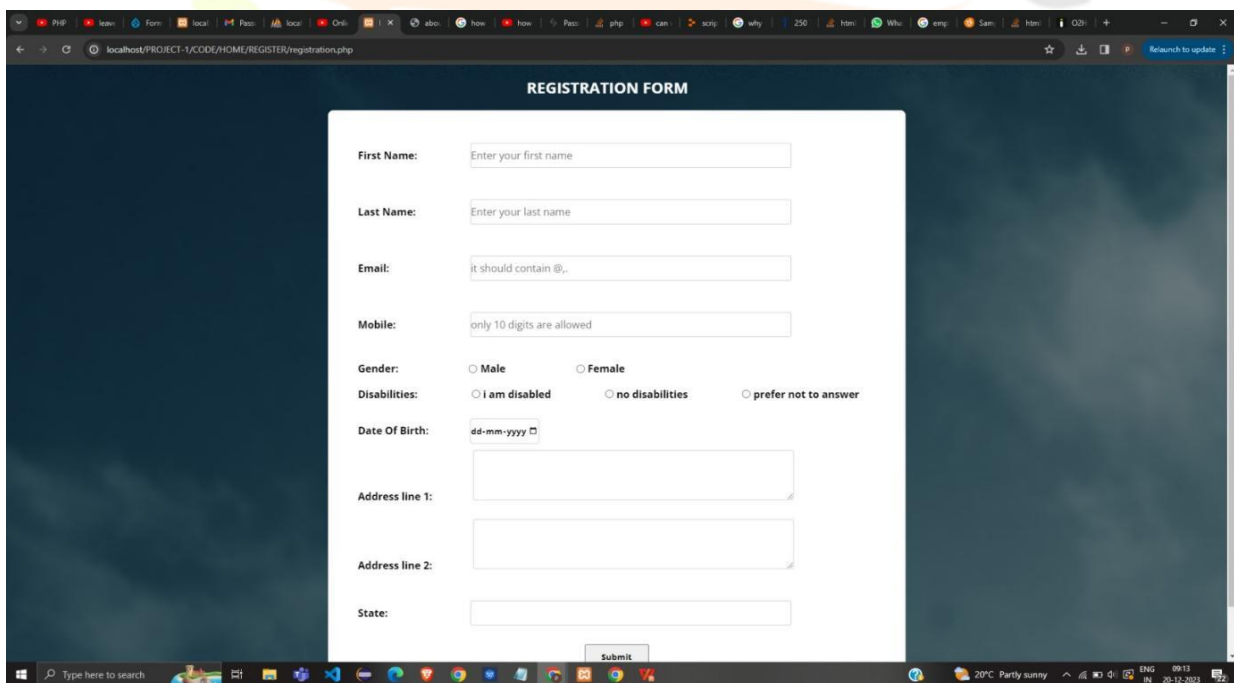


Figure 8.4: Registration Form
Form in which the Employee First fill their details for Registration

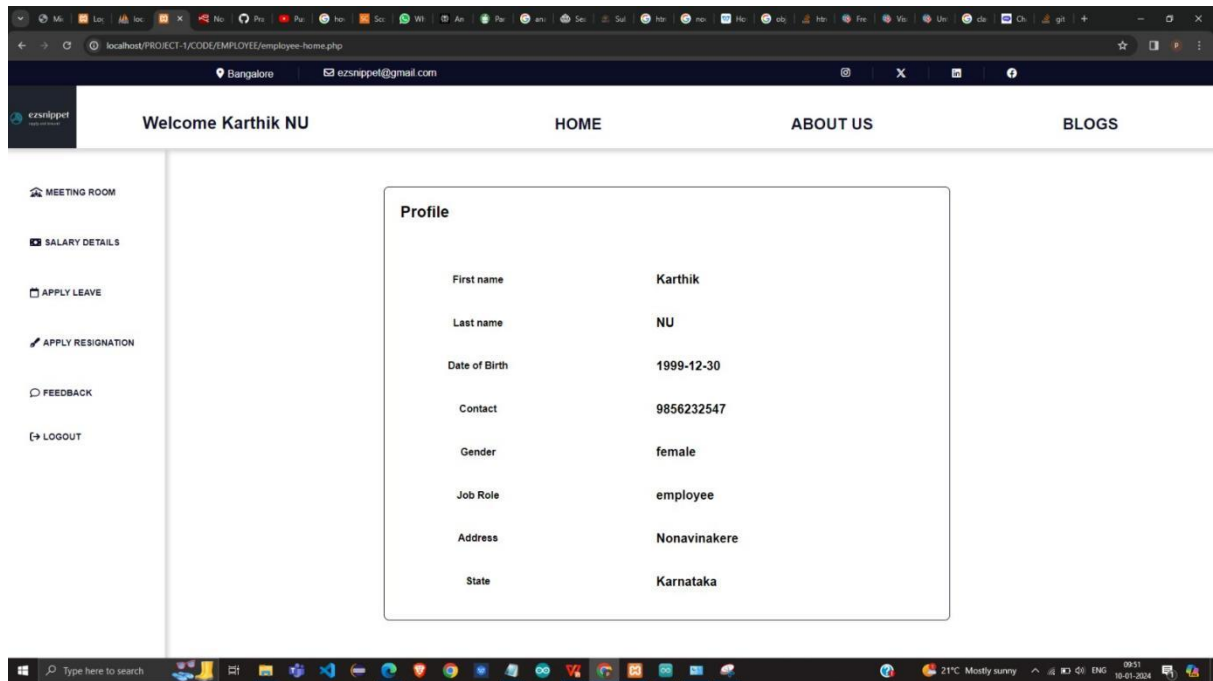


Figure 8.5: Employee Home Page
After login this will be the interface for an Employee

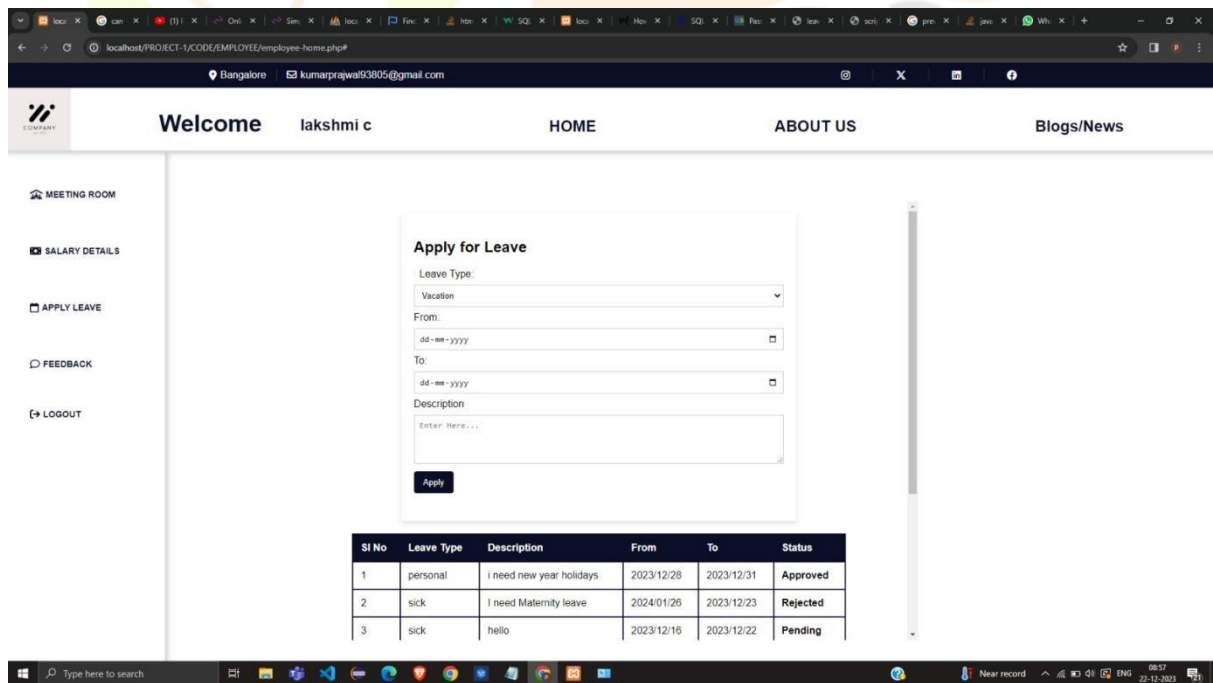


Figure 8.6: Leave Form
Interface for the Leave Application for an Employee(Leave Application)

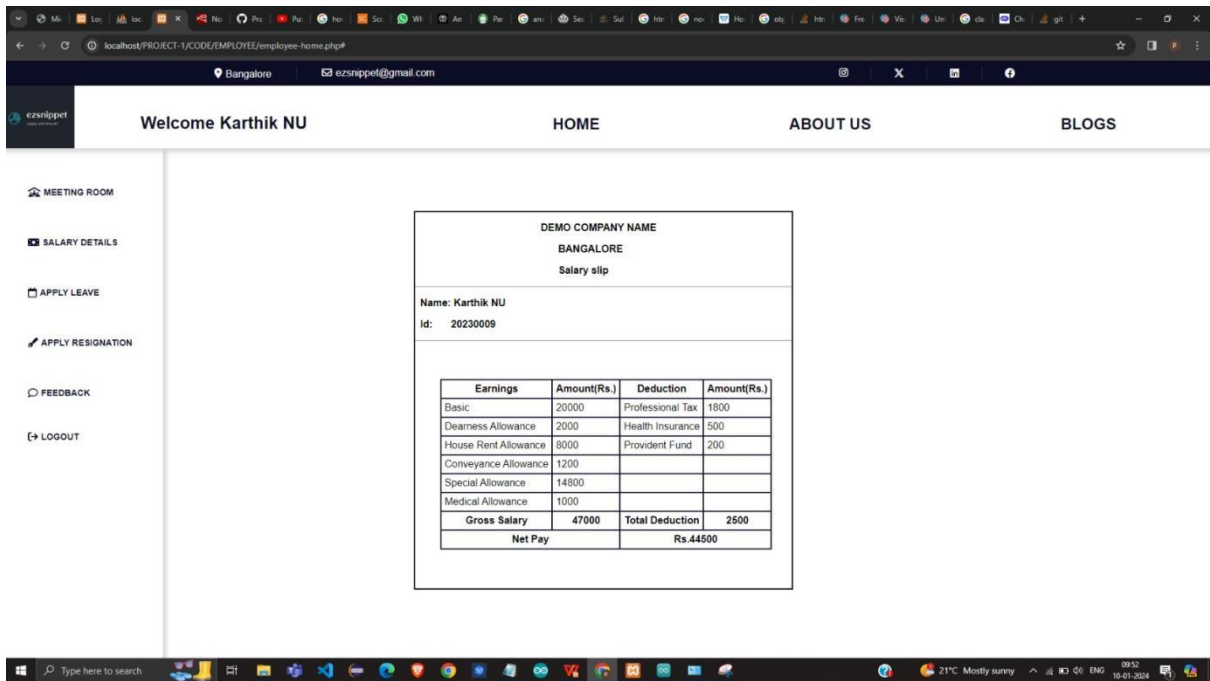


Figure 8.7: Salary Details
Interface for Displaying the Salary Details of an Employee

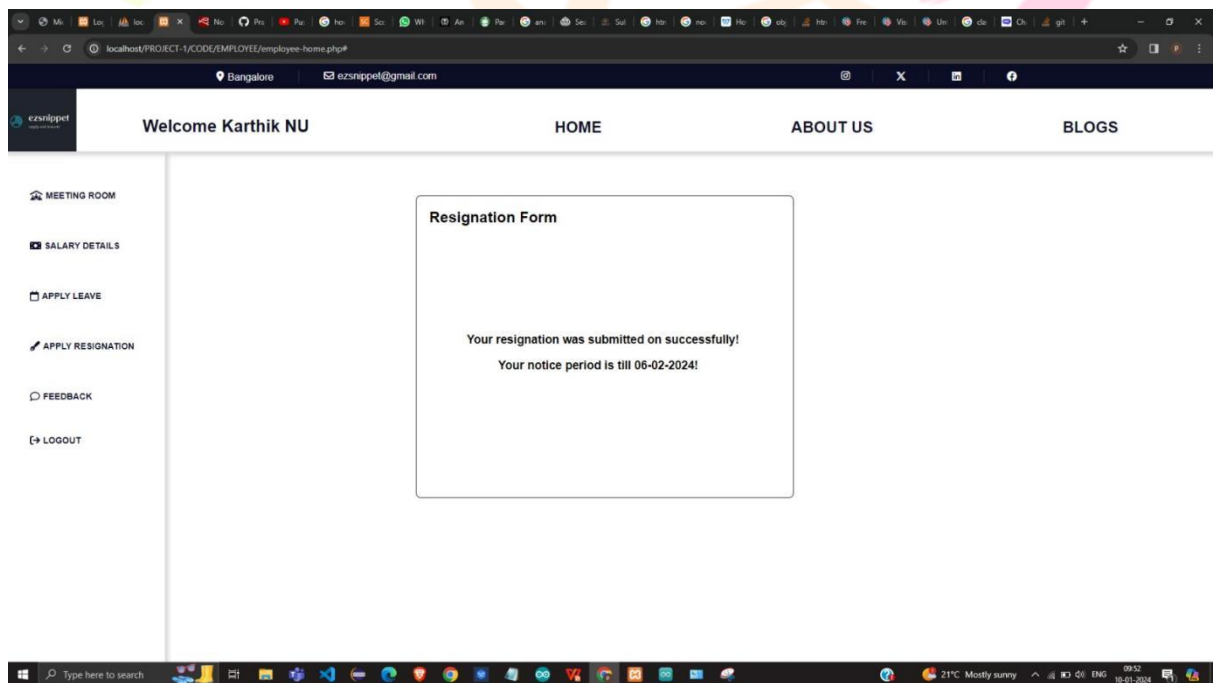


Figure 8.8: Resignation Form
Resignation Application for an Employee

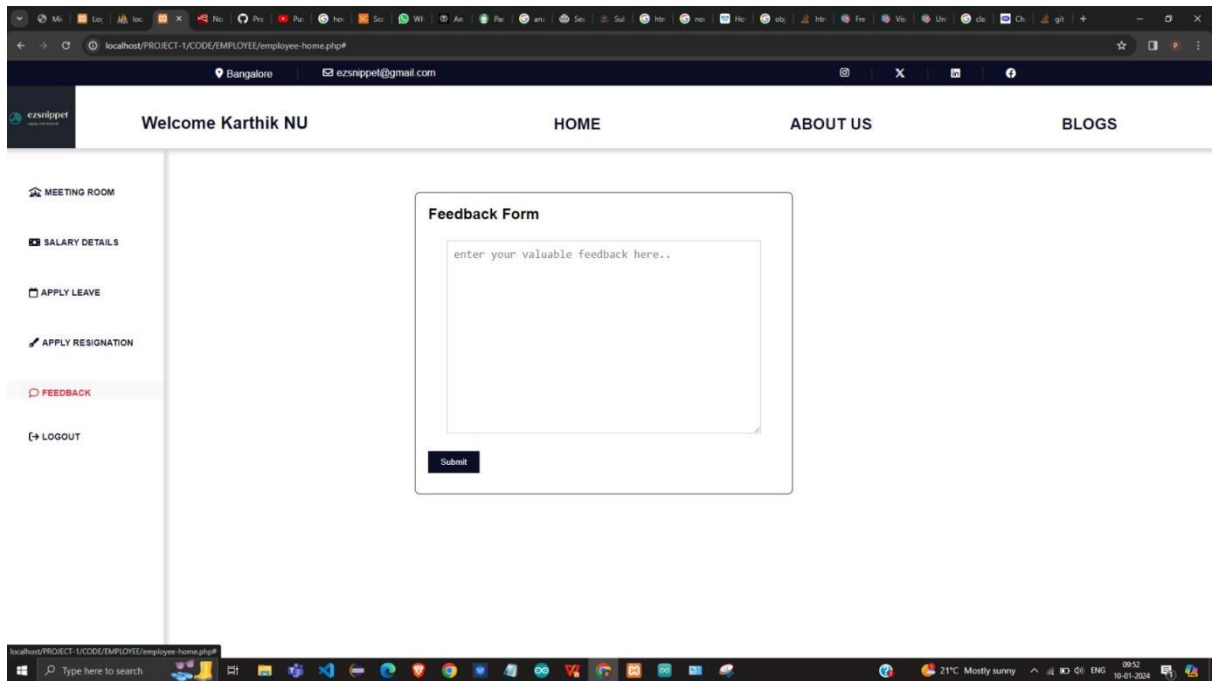


Figure 8.9: Feedback Form
Feedback Form of an Employee

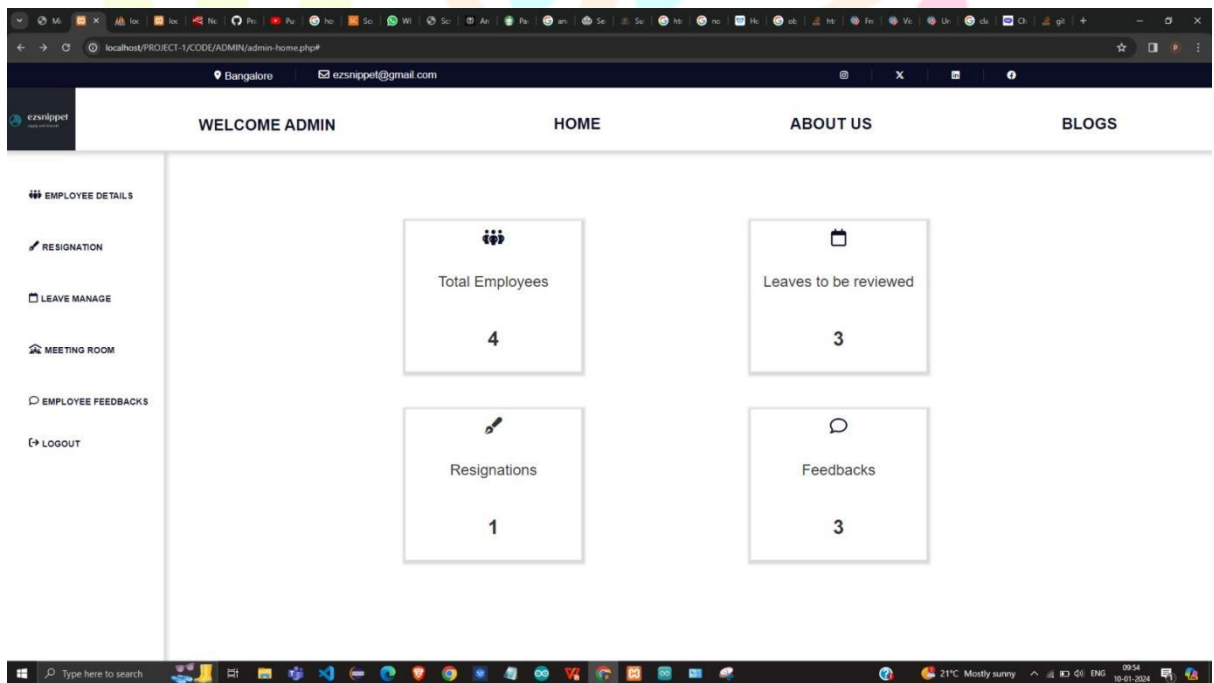


Figure 8.10: Admin Interface
Admin Dashboard and its Operations.

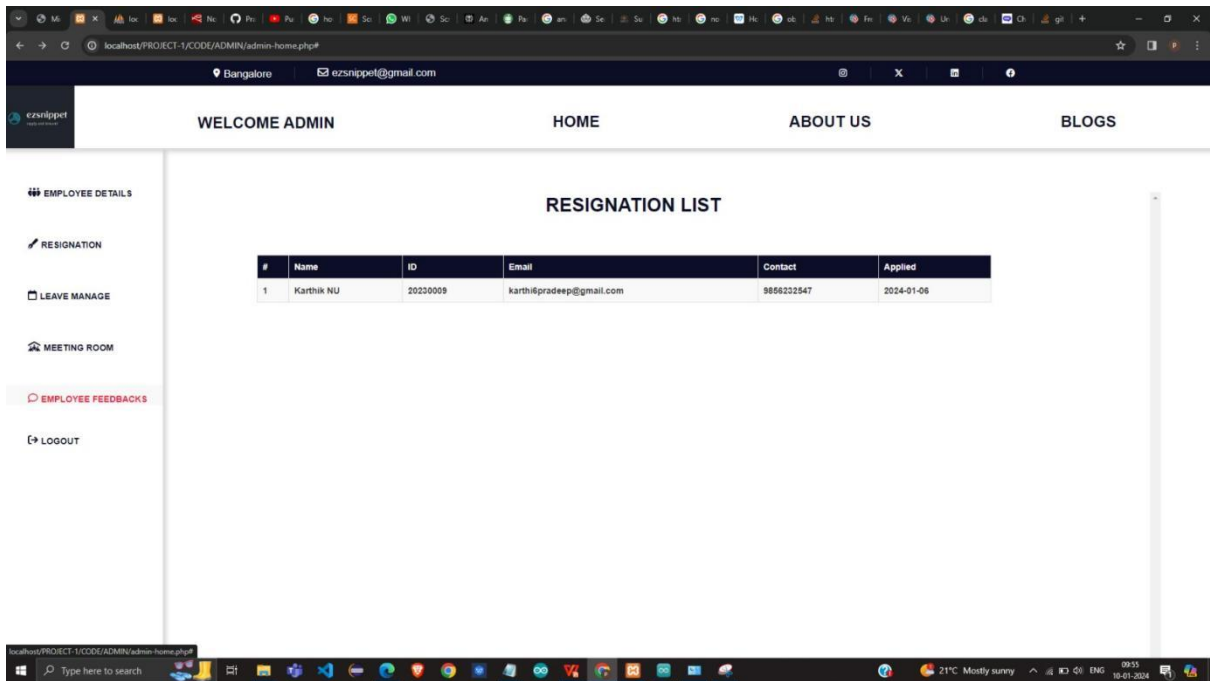


Figure 8.11: Resignation List
List Generated By Admin Side for those Employees who've applied for Resignation

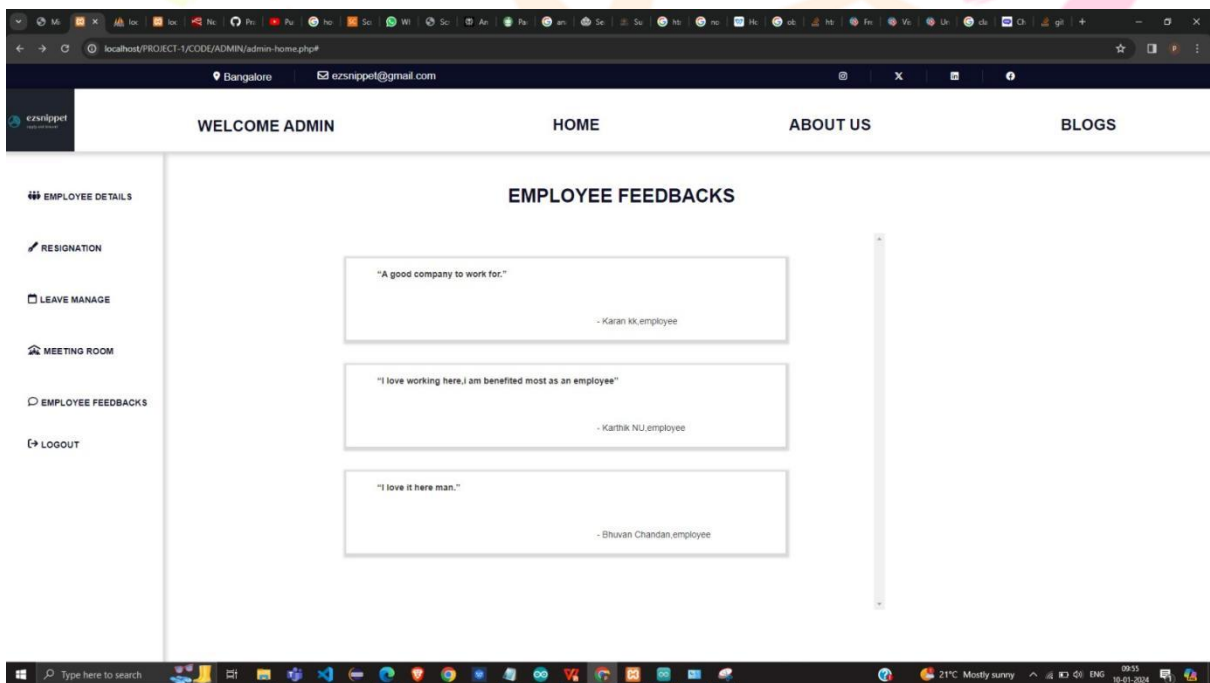


Figure 8.12: Employees Feedback
Feedback Given By The Employees And Reflecting on Admin Side.

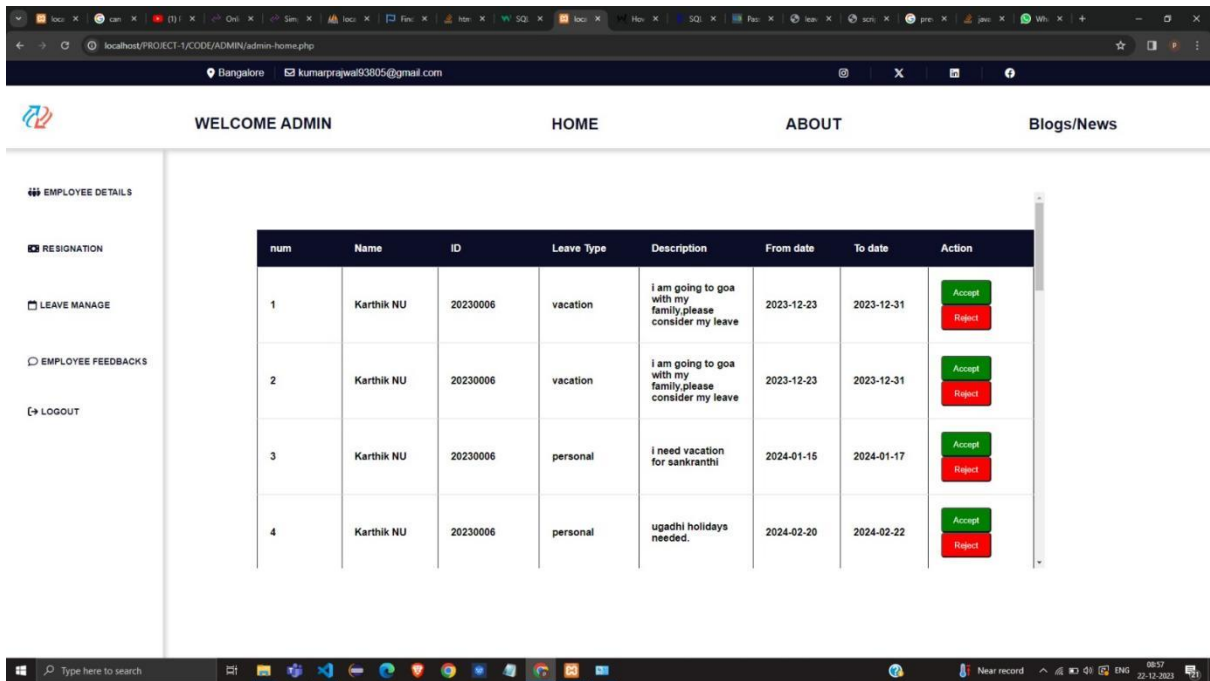


Figure 8.13: Leave Application
Leave Application Produced By Employees and Reflecting On Admins End

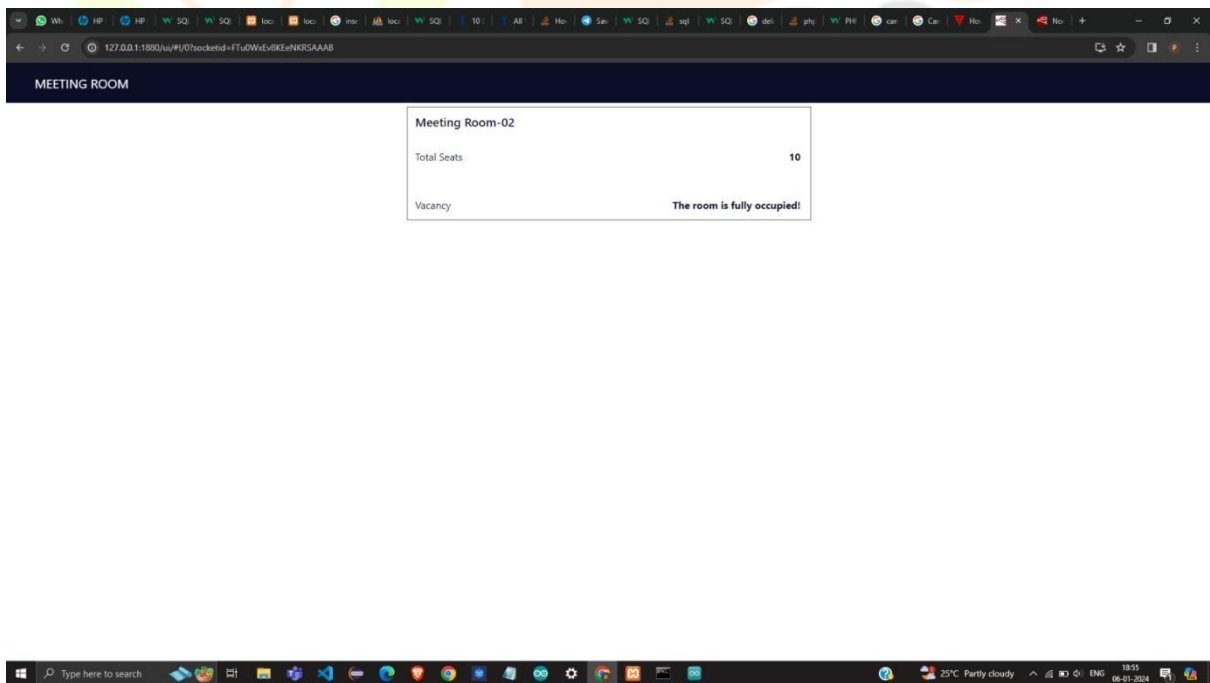


Figure 8.14: Meeting Room
Interface showing Room is Empty

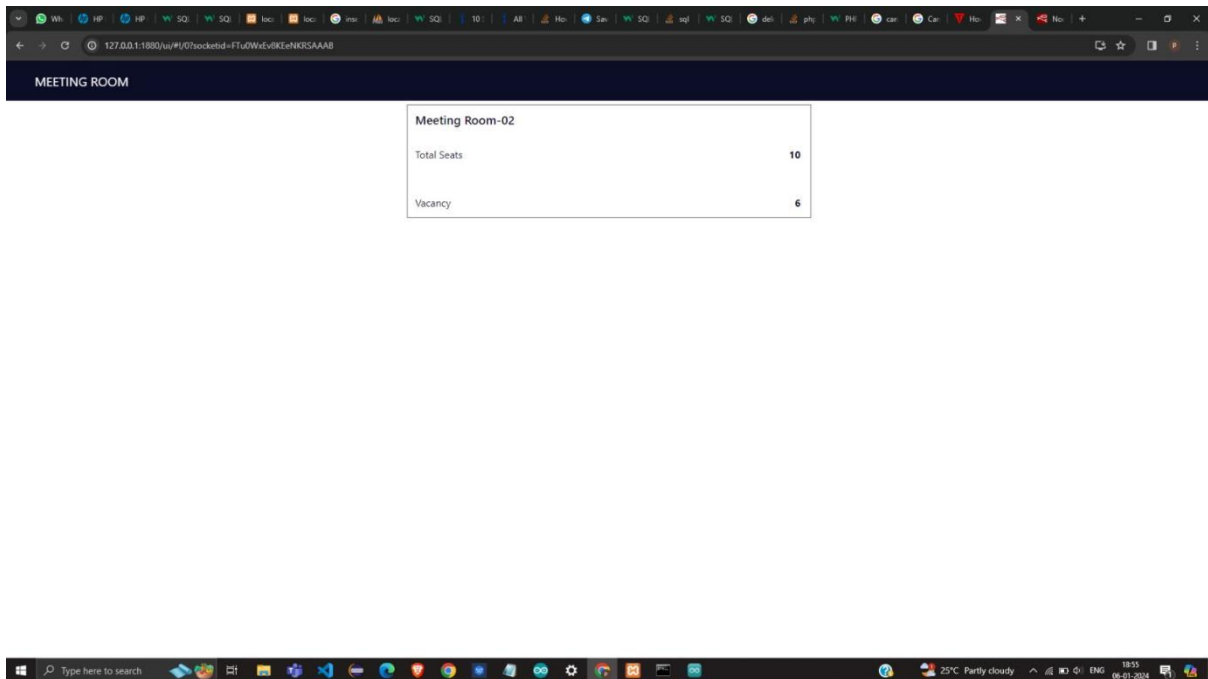


Figure 8.15: Meeting Room Interface Showing Vacant Seats

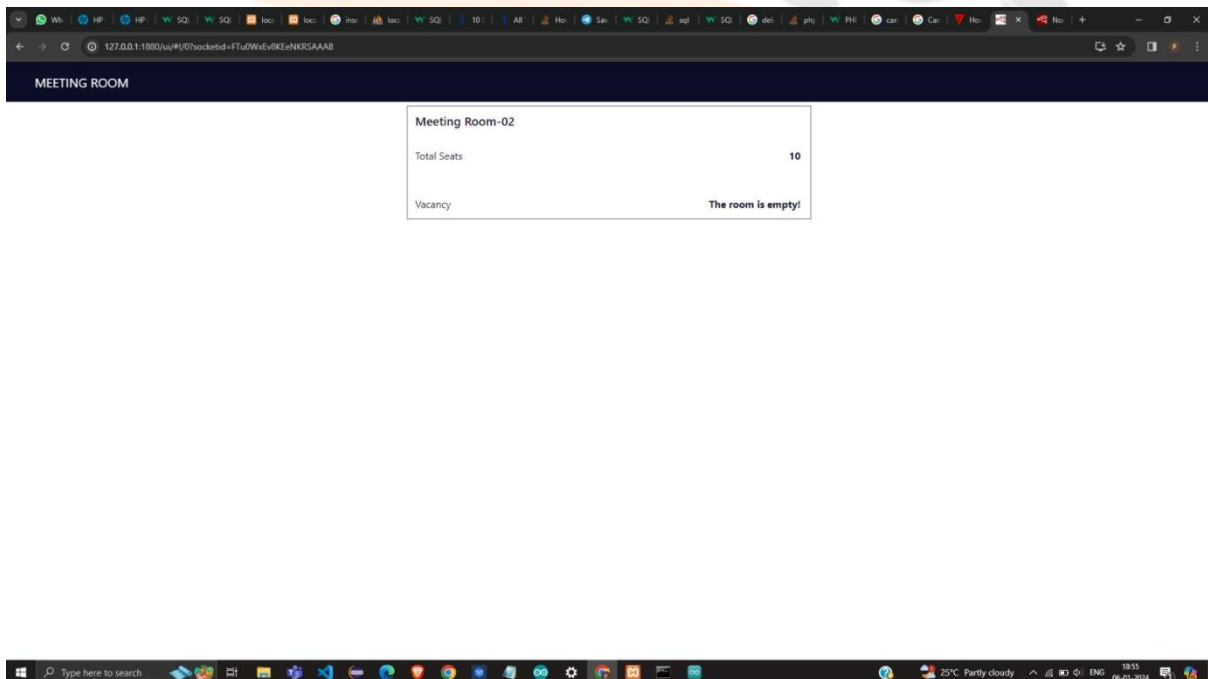


Figure 8.16: Meeting Room Interface showing Vacant Room

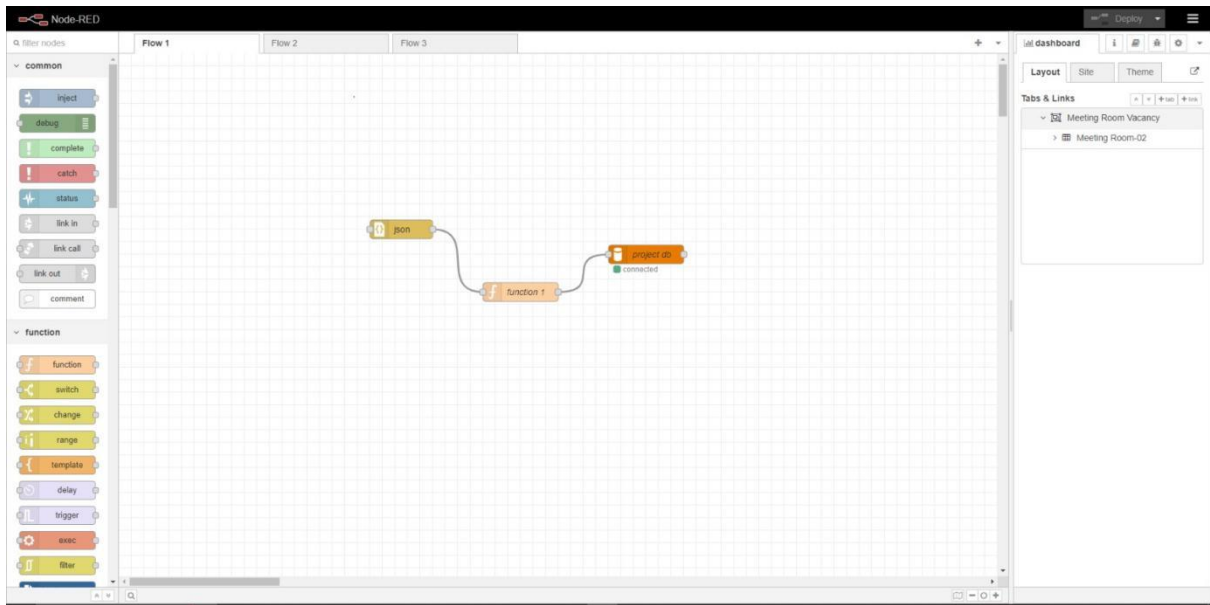


Figure 8.17: Node Red
To Display the content in Server Side

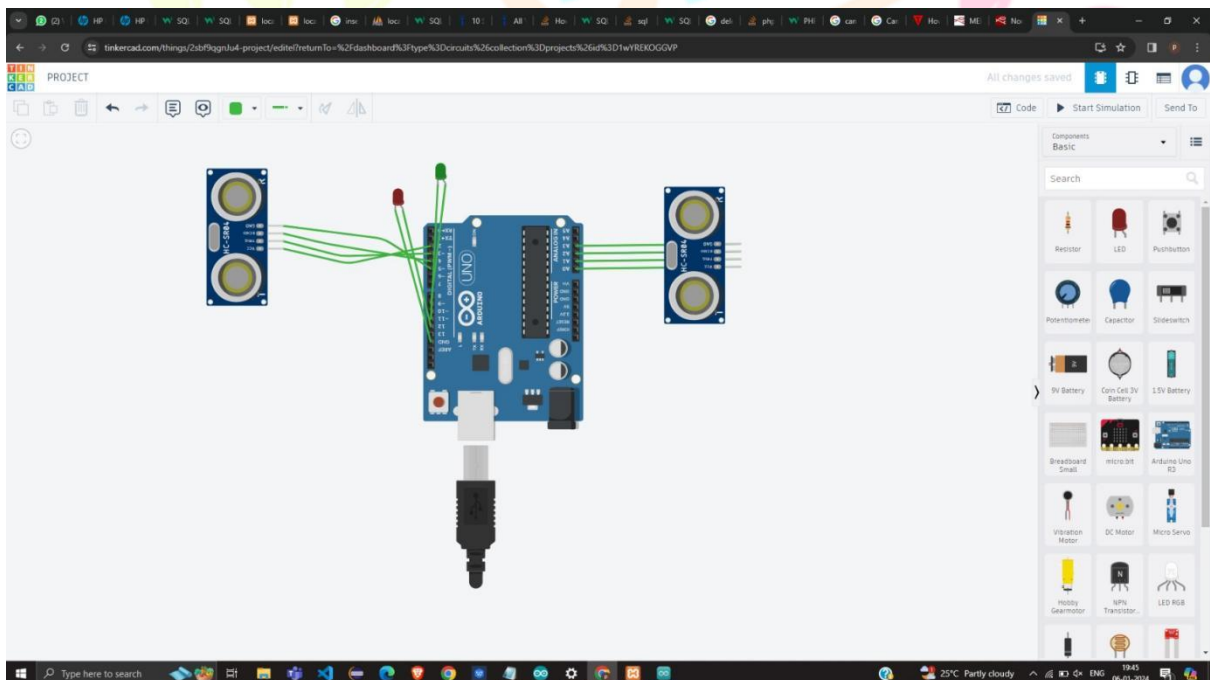


Figure 8.18: Arduino Connections
Showcasing the Digital Connections

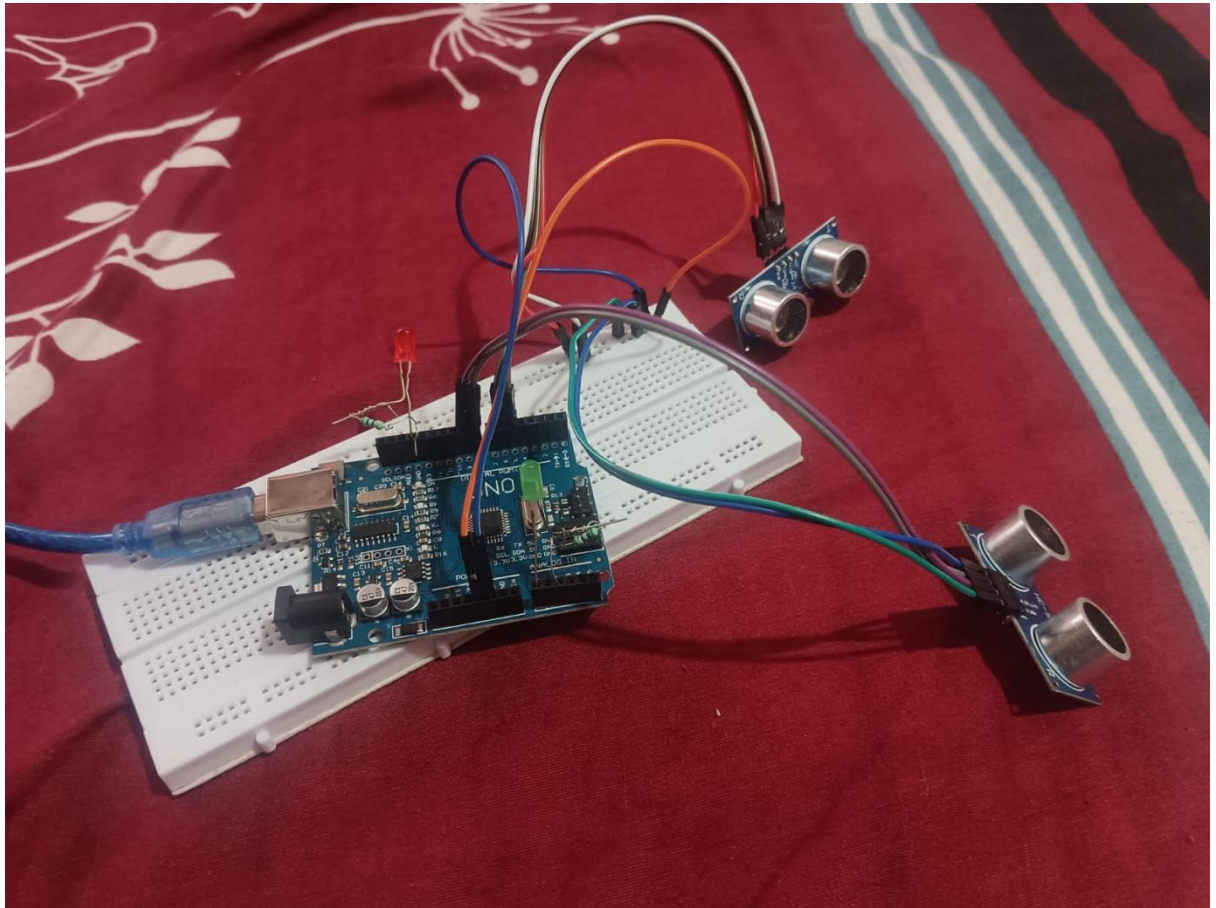


Figure 8.19: Hardware Connctetions
Showcasing the hardware connections

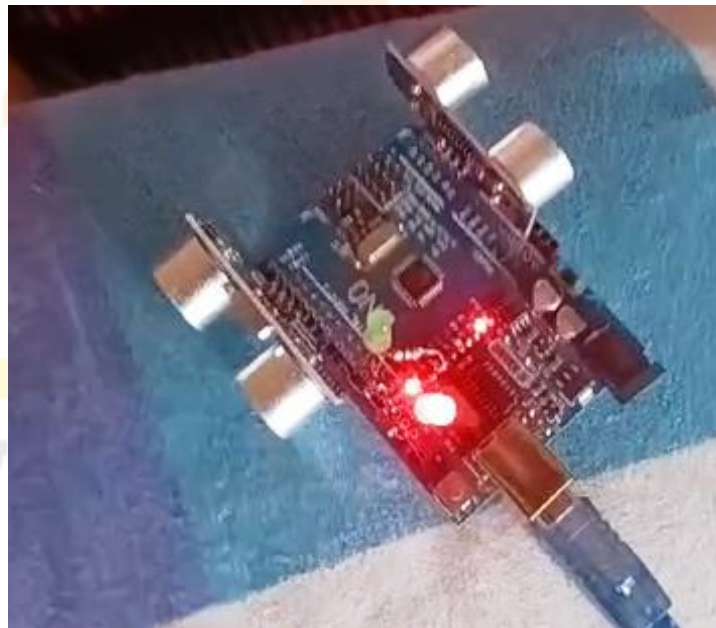


Figure 8.20: Showcasing the Room is Full

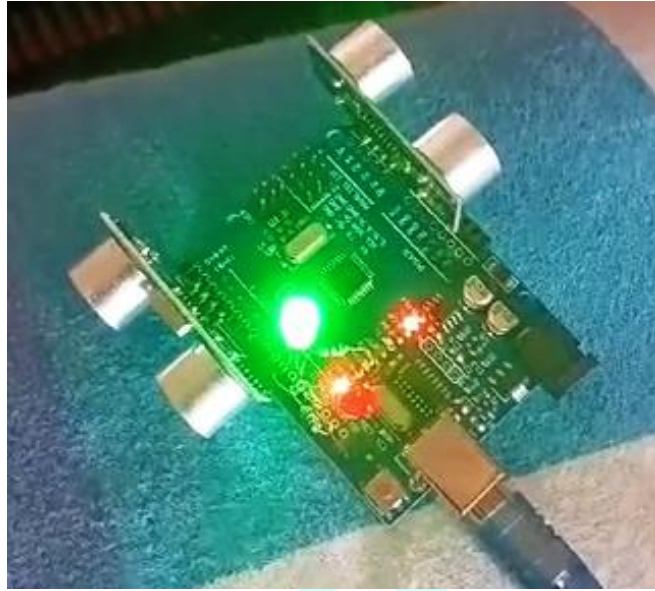


Figure 8.21: Showcasing the room is Still Empty or Vacant

V. RESULTS AND DISCUSSION

- PAPERLESS ADMINISTRATION:** Paperless administration has many benefits, especially when combined with a database management system (DBMS). Organizations can cut expenses on paper, printing, and physical storage by making the switch to a paperless workplace. Because digital papers can be encrypted and access controlled, this change also improves security. Additionally, a paperless workplace facilitates better data management, faster workflows, and easier information access when combined with a database management system (DBMS). This reduces trash and paper use, which not only increases productivity but also contributes to environmental sustainability. A DBMS and paperless administration work together to provide many advantages that make this a wise investment for contemporary businesses.
- PRECISE HEAD COUNT:** Using ultrasonic sensors has completely changed how the conference hall tracks headcounts. Accurate data on the number of people entering and leaving the meeting area is provided by these sensors, which are thoughtfully positioned at entry and exit locations. Precision is guaranteed by the technology, which does away with the errors that are frequently present in manual headcount procedures.
- REAL-TIME SEAT AVAILABILITY INFORMATION:** The project's capacity to provide real-time information on seat availability in the conference hall is one of its most notable results. This tool helps meeting space allotment decisions by providing administrators with relevant information. Workers may find out seat availability immediately, which makes it easier to locate appropriate locations for last-minute meetings or conversations.

- **DATABASE INTEGRITY:** In a database, precision, consistency, accuracy, and dependability of the information are referred to as data integrity. Ensuring that data is recorded precisely as intended and stays unmodified over its full life cycle is a crucial part of database administration. Ensuring data integrity is crucial for making well-informed business decisions and upholding consumer trust. This can be achieved by the implementation of standard procedures, policies, and database design. Data integrity is the antithesis of data corruption, with the goal of preventing inadvertent modifications to data. It should not be confused with data security, which is the process of shielding information from unwanted access.

VI.CONCLUSION

The goal of the suggested smart office management system is to improve worker productivity and foster a more positive work atmosphere. The system makes use of Internet of Things (IoT)-enabled smart office automation solutions to maximize sensor utilization, guaranteeing a seamless and intuitive smart office experience. To guarantee a smooth and effective workflow, the system places a strong emphasis on using only necessary sensors and location systems.

The time and effort spent on coordination can be greatly decreased by automating regular chores like organizing meetings, which is made possible by the incorporation of IoT technologies. Employee concentration can then be directed toward higher-value tasks, which eventually boosts output and creates a more positive work atmosphere. Additionally, the approach fosters a more enjoyable work environment, which may enhance worker happiness and wellbeing.

Other advantages of using IoT-enabled smart office automation solutions include increased security, cost savings, and energy efficiency. Organizations may improve efficiency, streamline processes, and give employees a more enjoyable and productive work environment by utilizing the newest technologies.

In summary, the suggested smart office management system has the ability to convert conventional workstations into effective, safe, and productive settings. It is backed by IoT enabled smart office automation solutions. Organizations may improve efficiency, streamline processes, and give employees a more enjoyable and productive work environment by utilizing the newest technologies.

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