Automated Meeting Rooms Using Audiovisual Sensors Using Internet of Things

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***Abstract*- The monumental changes happening in present infrastructure industry can mostly be attributed to developments in Internet of Things. Developing smarter conference rooms in offices have a great scope for innovation and digital transformation. In this project, we have developed a Smart Meeting Room (SMR) architecture and addressed various imminent issues pertaining to a meeting room environment by providing automation.**

The Smart Room requirements at real-time are automatically customized and act according to the customer's needs. Due to the developments in Machine to Machine (M2M) communication, we can establish a connection between the devices and the customers on a real-time basis. Various types of sensors like temperature sensor, humidity sensor, motion detector etc. are deployed in the smart room to monitor and enable the actuators. And All the rooms real time data is saved over cloud and Displayed on Systems Dash-Board ,if the temperature drops certain action takes place accordingly As well as if Air quality in room drops real time Alerts are provide by the system.

Index Terms- SMR, M2M, Dash-Board, Sensors.

1. INTRODUCTION

Internet of things (IoT) is the network of physical devices, vehicles, home appliances, and other items embedded with hardware, software, sensors, actuators, and connectivity which enables these things to connect, collect and exchange data. IoT involves extending Internet connectivity beyond standard devices, such as desktops, laptops, smart phones and tablets, to any range of traditionally dumb or non-INTERNET-enabled physical devices and everyday objects. Embedded with technology, these systems can communicate and talk with each other over the Internet, and they can be remotely monitored and controlled. With the arrival of Driver less vehicles, a branch of IoT, i.e. The Internet of Vehicle has got more attention.

Developing smarter conference rooms in offices have a great scope for innovation and digital transformation. In this project, we have developed a Smart Meeting Room (SMR) architecture and addressed various imminent issues pertaining to a meeting room environment by providing automation. The Smart Room requirements at real-time are automatically customized and act according to the customer's needs. Due to the developments in Machine to Machine (M2M) communication, we can establish a connection between the devices and the customers on a real-time basis. Various types of sensors like temperature sensor, humidity sensor, motion sensor etc. are deployed in the smart room to monitor and enable the actuators.

2. LITERATURE REVIEW

- A. Waibel,T. Schultz, M.Bett, M.Denecke, R.Malkin, I.Rogina, R.Stiefelhagen, and J. Yang. Smart: The smart meeting room task at ISL. In Proc. of ICASSP, 2003.

A SMR can be defined as a meeting or a conference room that offers an automated environment using available equipment for employees regular usage. It serves as a platform that offers equipment and services aimed to simplify the process of hosting and conducting meetings. The proposed SMR architecture shows the built-in functionalities of industrial Internet of Things (IoT) environment that provides capabilities which include secure entry systems, remote meeting room bookings and facilitation system, a specialized communication trigger to hospitality services and various sensors to measure the room conditions. SMR uses various sensors and actuators integrated with the gateway

module and communicates through the AppIoT framework.

- J. Neumann, J.R. Casas, D. Macho and J.R. Hidalgo, Integration of audiovisual sensors and technologies in a smart room. Personal and Ubiquitous Computing, vol.13, no.1, pp.1523, Springer, 2009.

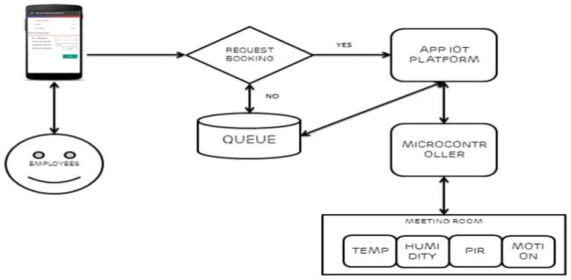
The smart room at UPC has been designed to hold group meetings, presentations and undergraduate courses in small groups. The room serves two purposes: first, it is an experimentation environment, where researchers test multimodal analysis and synthesis developments in the area of human computer interfaces; second, it doubles as a data collection facility for research purposes, providing data for technology development and evaluation. To this end, the room has been setup with audiovisual sensors and computing equipment.

[3]D. Kolokotsa, G.S. Stavrakakis, K. Kalaitzakis and D. Agoris Genetic algorithms optimized fuzzy controller for indoor environmental management in buildings implemented using PLC and local operating networks. EAAI, vol.15, no.5, pp. 417428, 2002

Technology has developed tremendously over the last few years. With the development of new technologies, day by day human life becomes more dependent on new technologies. Increase in energy demand and environmental pollution forces to adopt sustainable energy solutions without reducing human comfort level. Smart room provides energy efficient room automation by controlling, monitoring and utilization of renewable energy sources while reducing operating cost of appliances. Room automation mainly focus on controlling and monitoring of lights, fan, AC and other room appliances by considering workable and human friendly room environment. With the use of WAGO PLC, manually controlled room appliances now can be controlled remotely as well as automatically. In general smart room system consists of sensing devices and controlling unit.

[4]M.Saravanan, Arindam Das.Smart:"Smart Real-Time Meeting Room"

Till recently, many smart room architectures developed are primarily used only for sensing the environment of the meeting rooms. An application with more advanced capabilities is discussed in, which uses some audio-video analysis to deliver meeting rooms functionality, e.g. presentations keywords extraction, employee identification, and activity awareness. Previous approaches on audiovisual analysis rely on expensive and specialized hardware, making the installation and usage of the complete system more expensive and less portable. As far as decision making is concerned, various approaches have been proposed in the literature. Some of these approaches analyze numerical and statistical context and can learn how to act, leaning on adaptive functions that in most cases are represented by graphs, such as neural networks and probabilistic graphical models. The learning algorithm is an optimization method that specifies to correct the behavior. Time-varying adaptive functions such as recurrent neural networks have been used in decision making agents that act in dynamic environments, and in intelligent environments as well.



3. PROBLEM DEFINITION

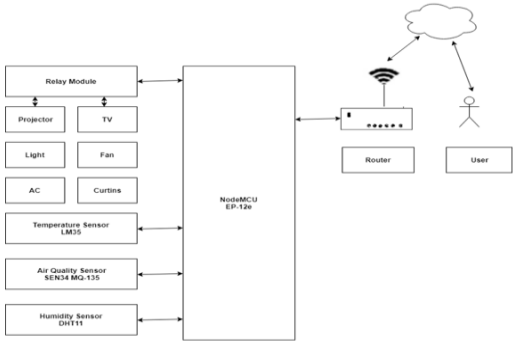
To design and develop smart meeting room /conference room using Internet of things. By using this system problem inside meeting room are address in real time. To overcome common connection problem this occurs due to lack of proper centralized system to control entire meeting room.

4. PROPOSED SYSTEM

The proposed system will work in following ways. When the people will arrive in the room it will be sensed by sensors and will automatically turn on the fans and light or the connected equipment's. In the mean while if we want to order some snacks or food it can be order without leaving the room with just by few clicks on centralized system.

While meeting is in the progress the system will also provide the real time updates of IN- door air quality index with the help of sensors .Thus the proposed

system will provide the suitable working environment with the help of various sensors.



5. HARDWARE REQUIREMENT

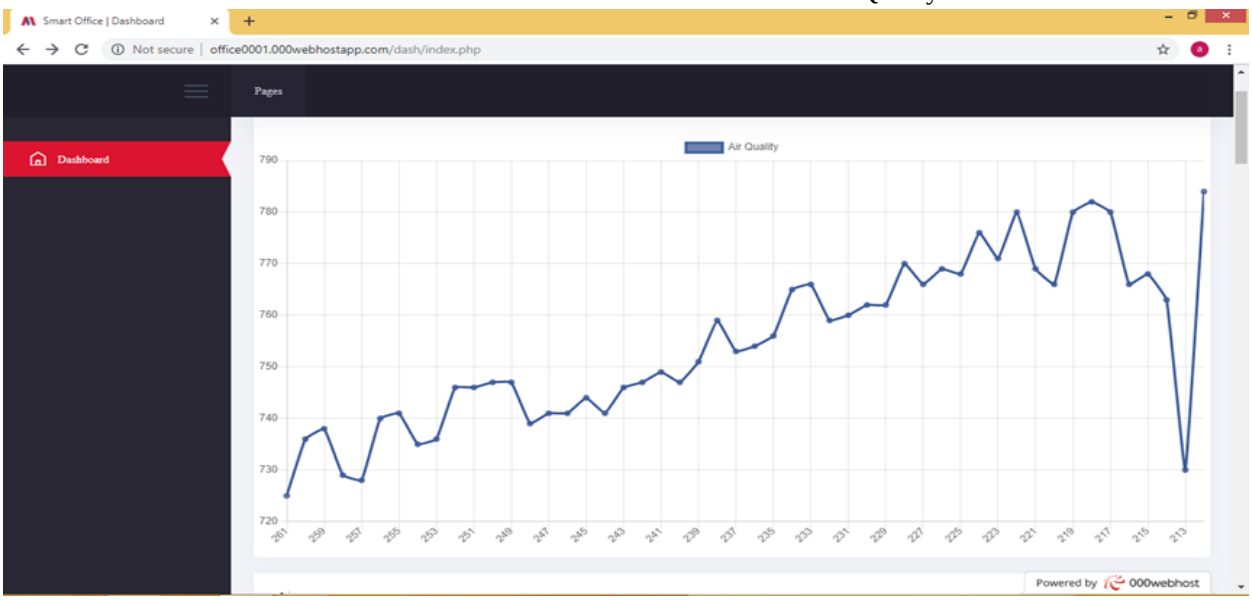
- NODE MCU EP12
- POWER SUPPLY 5V
- DHT11(humidity and Temprature sensor)
- MQ7(Air Quality Sensor)
- PIR(Motion sensor)
- RFID(Active & passive)

6. SOFTWARE REQUIREMENT

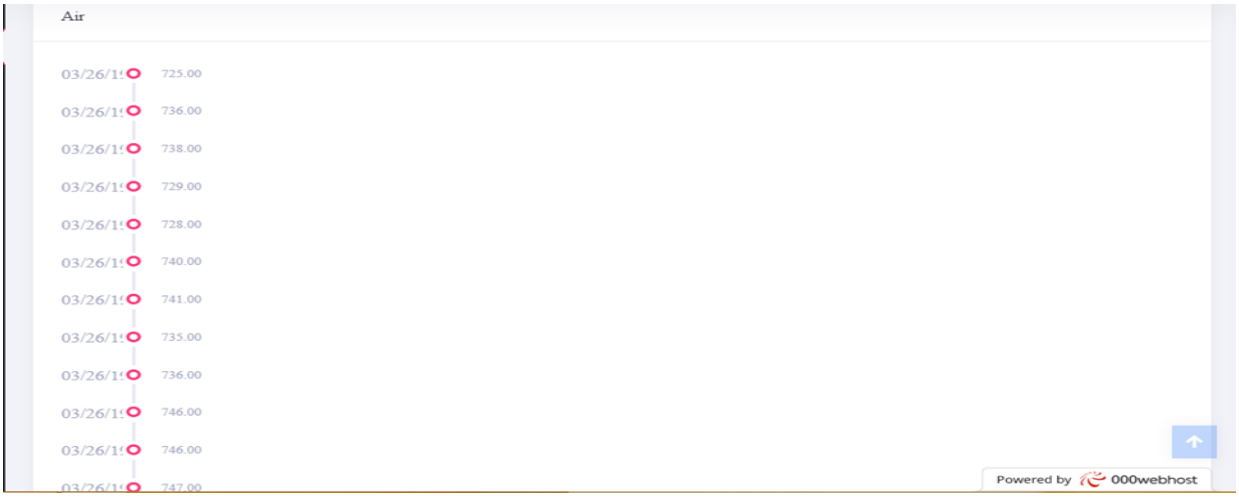
- Arduino IDE
- LINUX or WINDOWS 7 ABOVE
- LUA SCRIPTING LANGUAGE
- IOT CLOUD Platform
- SMS API
- WEBSITE

7. RESULTS

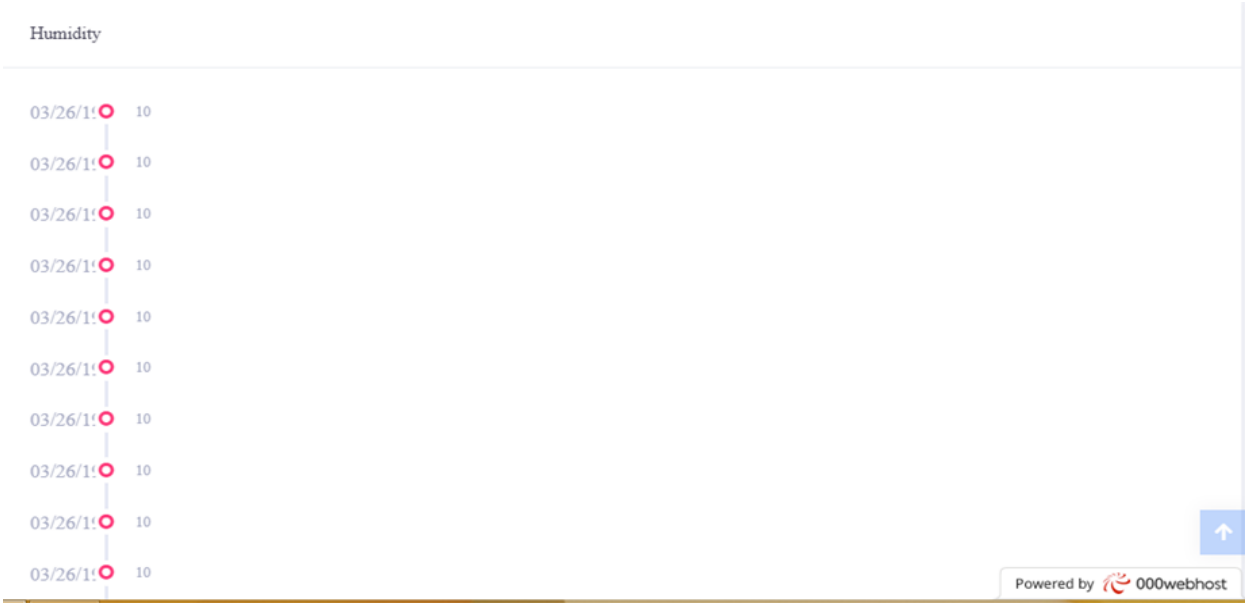
Outcome for Air Quality index Inside the room



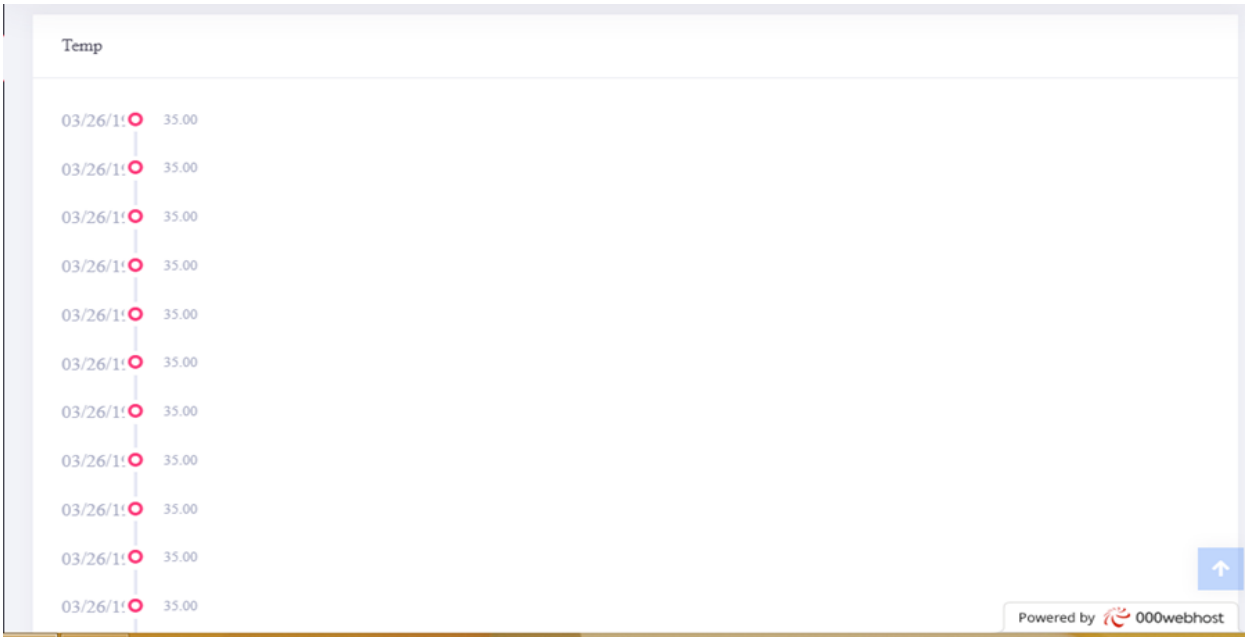
Values Of MQ7 Sensors(AirQuality)



Values Of DHT 11 Sensors(Humidity Sensors)



Values of Temp Sensors



7. CONCLUSION

The proposed an End-to-End system for Smart Office Solutions which Supports Environment productivity Along with real time analytics over the Data from Meet- ing Room has been proposed.

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