

# Implementation of Smart Table Using IoT

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**Abstract:** The Smart Table will provide great convenience to the user by reducing some of the human effort by giving the access to some of the features which comes very much handy when put into daily usage. The table comprises of adjustable height feature which will enable the use to adjust the table according to the usage. There is a screen provided on the table which can be flipped like a laptop screen and can be used for other operations like Home Automation. Also, for user authentication there is a fingerprint module mounted on the table.

**Keywords:** IoT, Fingerprint module, Home automation, Arduino, Microcontroller.

## 1. Introduction

The invention is in the field of Computer and Electronics engineering which provides the solution to the problems arising in conventional tables by using present technologies.

Technological advancement is the key to the era of development for humans. And in the current world, we have to be dependent upon existing systems. There are many such products or application in the practice which needs to be upgraded with the newest technologies possible. To do so one has to be well aware of the current trend of the market and should be working fit into it. And for now, if we consider the smart tables which have been developed also does not have the kind of upgradation needed to fit into the user's requirement and so we are dependent on the existing smart tables. An existing smart table provides some smart features but it is no more helpful as compared to the traditional tables when convenience and comfort for individual is taken into consideration. The existing smart tables does not provide home automation which is why in the current scenario it is not able to give user the proper comfort and convenience they need. A smart table should also provide the facility to allow the user to adjust the table height as it is a major problem in real life.

Different user's need different height adjustments to fit it according to their comfort. Also, in the traditional smart tables the screen is placed flat on the surface of table, so it becomes a discomfort for the user whenever there is extensible use of the screen content. These types of issues are currently existing in the current smart table and the solution to overcome such problems are supposed to be developed. The Smart Table proposed here overcomes all the above-mentioned problems associated with the traditional smart tables.

The proposed Smart Table comes with an adjustable height mechanism which will enable the user to adjust the height of

the table according to their comfort whenever needed. The height of the table can be controlled with the help of the touch button associated with the table. Also, the screen is not placed flat on the table, it is provided with mechanism which enables the screen to be flipped in the upward direction just like the laptop screens. For this functionality also there will be a touch button on the table to control its movement. This will help the user to use the table more efficiently and effortlessly. While the screen is on and user has access to the screen, the user can control the home appliances using the inbuilt application within the system i.e. Home Automation. The user can have the access to appliances like Fan, Light, Television, Door, etc. The Home Automation will be controlled and centrally accessed with the help of microcontroller and other chipsets.

## 2. Objectives

1. Providing advance system to the existing system to improve the working and comfort.
2. To provide flexibility and smart living to the user.
3. To maintain privacy by implementing user authentication.
4. To provide Home Automation.

## 3. Existing System Drawbacks

1. The screen is in placed flat on the table because of that it is not that convenient for the user.
2. Height is also fixed so cannot be adjusted.
3. Lack of automation for the user's comfort.

## 4. Literature Survey

1) Name: Access control of door and Home Security by Raspberry Pi through internet

Author: Md. Nasimuzzaman Chowdhury, Md. Shiblee Nooman, Srijon Sarker.

Description: In the present age Internet of things (IOT) has entered a golden era of rapid growth. The Internet of things is a concept that aims to extend the benefits of the regular Internet—constant connectivity, remote control ability, data sharing, and so on—to goods in the physical world. Things are connected with the internet. This concept can be used to manage the security issues in a cost effective way. In this paper work a system is being developed to connect any door with the internet, so that the access control system can be controlled from any where in the world. In case one is not at home and an outsider

is at door then the authorized person will be notified about the outsider via text and the person can see the outsider from the web through the camera and the system will take a picture of the outsider and keep a record by sending an attachment through E-mail or text. If the authorized person wants to give a message the outsider it can be sent easily through the message and it will be seen in a screen on the front face of the door. The door lock can be operated through the internet. With the help of this system an evidence of the outsider can be kept as a record if any emergency case or problem occurs.

2) Name: Home Automation System using android and Wi-Fi

Author: R. S. Surya-vanshi, Kunal Khivensara, Gulam-Hussain, Nitish Bansal, Vikash Kumar.

Description: Smart home is an observing, controlling and investigating service which includes Wireless transmission technology and electronic sensor innovation. It allows the client to get the full scope of services, the opportunity for continuous monitoring and controlling of the home environment. A web server is created which consists of screens for home environment parameters, for example, house temperature, light intensity, LDR sensor, PIR sensor, motion detection, fire detection, smoke sensor, humidity sensor and LPG gas leakage for monitoring and controlling. In this project Raspberry Pi3B+ is used for monitoring, processing, controlling various sensors and communication with web server, because of its new features and ease of communicating through Internet of Things (IoT).

3) Name: RaspberryPI and Wi-Fi Based Home- Automation

Author: P. Bhagya lakshmi, G. Divya, L. Aravinda.  
Description: In current days, as the technology improves everyday, every-one seems to automate most of the things to take benefit in providing easiness in life, secure and saving power. The objective of this paper is to develop an home automation system based on Raspberry Pi by reading the message body of mail which we are sending. Here the body of the receiving mail is read by the algorithm put into Raspberry Pi and it will resend the acknowledgement to that mail\_id, if it is successfully sent or not. This algorithm is created in python, which is default programming language provided. Store these results in internet by creating new channel API in thing-speak, which is an IoT system.

4) Name: Operating systems for low-end devices in the internet of things: A survey

Author: O. Hahm et al.

Description: The Internet of Things (IoT) is projected to soon interconnect tens of billions of new devices, in large part also connected to the Internet. IoT devices have all the higher level devices which can use normal operating systems (OS) such as Ubuntu, and lower level devices which can't, due to resource limitations,

e.g. very less memory, operational power, and input supply. However, large level IoT software making, deployment, and maintenance requires an appropriate OS to build upon. In this

paper, we thus look in deep the specific needs that an OS should provide to run on lower level IoT devices, and we survey applicable operating systems, focusing on candidates that could become an equal of Ubuntu for such devices, open source OS for lower level IoT devices.

5) Name: "IoT smart home adoption: The importance of proper level automation

Author: H. Yang, W. Lee, and H. Lee

Description: The word "smart" has been used in various fields and is widely accepted to mean intelligence. Smart house serving, one of the representative developing technologies in the IoT world, has changed house tools into being more intellectual, controllable, and interconnected. However, the intelligence and feasibility of a smart house service are different concepts, under certain aspects. In addition, the level of intelligence or feasibility of a smart home service that users want may differ according to the user. As users of smart house services have diversified in past years, providing the required functions and features is important to the service. Thus, this study examines the smart home service features that current users require and empirically evaluates the relationship between the critical factors and the adoption behavior with 216 samples from Korea. The minimal impact of personal personality on behavior is also checked. The results of the study provide various problems.

6) Name: Y. L. Hsu, P. H. Chou, H. C. Chang, S. L. Lin, S. C. Yang, H. Y. Su, C. C. Chang, Y. S. Cheng, and Y. C. Kuo

Description: Design and implementation of a smart home system using multi-sensor data fusion technology  
Description: This paper aims to develop a multi-sensor data fusion technology-based smart home system by integrating wearable intelligent technology, artificial intelligence, and sensor fusion technology. We have implemented the following method to create an intellectual smart house atmosphere: (1) a wearable motion sensing device to be placed on residents' wrists and its corresponding 3D gesture identification algorithm to make a easy automated household devices controlling; (2) a wearable motion sensing device mounted on a resident's feet and its indoor positioning algorithm to understand an noticeable in-house GPS system for intelligent power handling; (3) a multisensor circuit module and an intelligent fire detection and alarm algorithm to realize a home safety and fire detection system. In addition, an intellectual monitoring application is implemented to give in real-time data about the smart house system, such as environmental atmosphere, CO decompositions, interactive environmental alert, household appliance status, human movement indication, and the results of gesture identification and in-house placement. Moreover, an experimental testing for verification of the noticeable and feasible of the smart house system was built and tested experimentally. The outputs gives the 3 dimensional movements identification mechanism could achieve identification rates for automated household devices control of 92.0%, 94.8%, 95.3%, and 87.7% by the 2-fold cross-

validation, 5-fold cross-validation, 10-fold cross-validation, and leave-one-subject-out cross-validation strategies. For in-house placement and smart energy handling, the distance correctness and placement correctness were upto 0.22% and 3.36% of the total traveled distance in the indoor environment. For house safety and fire identification, the categorization rate achieved 98.81% accuracy for determining the conditions of the indoor living environment.

## 5. Proposed System

### A. Adjustable Height

The height of the table can be adjusted by user according to their requirement. It can be adjusted/operated with the help of the buttons provided on the table.

### B. Fingerprint Module

The Fingerprint is one of the correct way to detect and identify the Authorized person, we know that fingerprint is unique even identical twins do not have identical fingerprints. By taking this into consideration we can be very confident regarding security requirement. The finger print module will be connected to the Arduino which will check the user's validation and pass the signal to the relay which will power up the display unit.

Fingerprint sensor Arduino setup:

The fingerprint recognition method has two steps:

1. Adding Fingerprint.
2. Identifying Fingerprint.

These steps results microcontroller to identify correct fingerprint.

### C. Home Automation

In current world, people have mobile phones along with them all the time. So, it is important to take these into usage of controlling house devices. Presented here is a home automation system using a simple application, which you can use to control electrical appliances with clicks. Commands are sent via Bluetooth to Arduino Uno, which controls the relay operation (ON or OFF). The Home Automation gives the user access to home appliances like Lights, Fans, Television, etc. Which can be controlled by using the screen on the table and the appliances can be controlled accordingly like on or off depending on need.

The focus of smart table is completely over the user's comfort, so it provides the feature for full home automation. Suppose the user is busy with study or work and a visitor is at door then there is no need for the user to go and open the door manually, using home automation it can be done using the screen. It shows the real-time picture of the person on the screen. Also, it controls the light and Fan of the other room also while studying.

## 6. Conclusion

The purpose of the invention is to automate and add convenience and comfort to the user's experience that

eventually leads to a smart living environment. User has the option to use the system according to their comfort and enables them to do their work without facing any dis-comfort. It provides privacy as only authenticated users can access the features provided like adjustable height, screen, etc.

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