



DESIGN AND IMPLEMENTATION OF IoT BASED SMART MIRROR

Aryman Kaushik¹, Prasanna Singh², Sarabjeet Kaur²

¹Computer Science and Engineering (IoT), Netaji Subhas University of Technology, Delhi, India

²Electronics and Communication Engineering, Noida Institute of Engineering and Technology, AKTU, India

ABSTRACT

Magic Mirror is the implementation of a multi-media interactive mirror system. By fusing processing of images and audio, Internet connectivity, 3D or multimedia, or standard peripherals and reflective glass, The Magic Mirror is available deployed in currently marketed personal computers & handheld devices. Modern technology has made life easier and more time-efficient for people. This essay describes the creation of a smart mirror, which will simplify and speed up daily tasks. A straightforward mirror that has been improved with technology is called the Smart Mirror. The objective of the smart mirror is to make it simple to access information services like news feeds, the weather, the time, and other items. Additionally, it offers some fundamental AI capabilities, such as real-time user engagement. The Raspberry Pi 3 computer and the architecture that retrieves data from the internet over Wi-Fi are known as the Smart Mirror CPU. Smart Mirror can recognize the user with a speech and facial recognition model. In today's culture, we have access to information via our phones, laptops, desktops, and other devices. The aspect that worries the average person is that it can be used to make daily life simpler and faster.

KEYWORDS - Peripherals, a framework, Internet access, multimedia, Raspberry Pi 3, Internet of Things, and reflective glasses

1. INTRODUCTION

The Internet of Things has made it possible for a new technology that can connect objects intelligently; intelligent communication between objects can now be carried out without the need for human contact. People can now complete their work more quickly and effectively thanks to technology. Smart Mirror, one of its uses, may show the time, date, weather, and traffic conditions on the mirror. The mirror has the properties of having a clear back side and a reflective front side that functions as a mirror, allowing whatever shown on the monitor to be seen on the mirror surface.

To guarantee that all of the information is seen, the mirror must be set directly on the surface. RaspberryPi, which maintains the Raspbian Jessie PIXEL running system (OS), the LCD is shielded by an acrylic layer. monitoran internet browser, and Java Script like Python for the UX/UI display can all be used to achieve all of these capabilities. The use of Smart Mirror has several benefits and simplifies life, for example, by eliminating the need to check a mobile device for alerts, weather updates, etc. The proposed concept is to create an interactive, futuristic Smart Mirror using the internet of things for ambient home automation, business applications, and public environments. This project will present real-world data and display it to the user based on his or her requirements on the mirror, which is what distinguishes it as a Smart Mirror. The Smart Mirror's features display the weather right now, the most recent news, as well as the dates and times we may use voice commands to communicate with the Smart Mirror.

A tiny single board, the Raspberry Pi, is computer (SBC) called the Raspberry Pi, developed by the UK's in the Raspberry Pi Foundation partnership using Broadcom The Raspberry Pi

project's first focus was to advance fundamental computer science research on the classroom as well as in undeveloped nations. the initial design was used far more than planned and sold beyond the intended industry for applications like robotics. Given its modest price, high versatility, and start design, It's utilised in many fields, included meteorological observation. Compatible with HDMI and USB standards, it is widely used by computer and electronics enthusiasts For the line of compact single-board computers known as the Raspberry Pi, the A Unix-like operating system based on the Debian Linux distribution is Raspberry Pi OS (formerly Raspbian). Raspbian is utilised by the Raspberry Pi. Jessie PIXEL running system (OS), the LCD is shielded by an acrylic layer. Monitor a web browser, and Python or JavaScript for the UX/UI display. It was initially produced independently in 2012, and the Raspberry Pi Foundation has been disseminating it as the primary operating system for these boards since 2013. Using the smart mirror has several benefits and makes life easier by not having to constantly check your phone for alerts, weather updates, and more.

2. MOTIVATION

We spend a lot of time using electronic devices and are totally reliant on them for any information we need as we move toward a technologically driven, automated future. We therefore considered automating one of the fundamental tasks that are a part of a daily routine, namely "MIRROR," to assist us with the fundamental everyday mandatory information as a matter of concern to limit screen time among persons. This device's primary goal is to enable technology-enhanced multitasking in daily life and to give critical features on an aesthetically pleasing mirror.



We will be able to visually experience the information we are looking for right on the screen of the mirror if it is designed as a smart mirror using IOT. As we frequently check our phones for notifications, doing so would allow us to save time. Additionally, since the news is displayed on a mirror, two activities are completed concurrently (getting ready for the day and getting the information like news headlines, traffic updates, climatic condition). Utilizing this SMART MIRROR in our daily lives will improve our way of living and aid in multitasking. In addition, we can personalise this mirror to meet our demands, which would simplify some requirements as well. Our primary goal in developing this intriguing and practical tool was to make it affordable for as many people as possible.

3. REQUIREMENTS FOR HARDWARE AND SOFTWARE

A) **Hardware Parts-Raspberry Pi** It is the Raspberry Pi. Main equipment that enables Smart Mirror's ability to display personalized data to each user on the screen. It is a compact individual board computer that uses an internal operating system to run programs. This component comes pre-installed with Raspbian OS (operating system), a Debian-based operating system. You can use any programming language to write the code. This essay is based on Java Script. Once the written code is transferred to the device, the monitor will be able to show the time, date, email notifications, calendars, news feeds, and music as well as weather predictions. It uses web-based services that show the weather, news, and other data retrieving data from a net and presenting it for user as tokens on a monitor. To achieve To connect to the internet, the Raspberry Pi module features a Wi-Fi module. A microphone connected via a USB card is used for voice recognition, allowing users to set reminders or participate in conversations by speaking into the mirror. Raspberry Pi, Figure 1.

B) An LED monitor serves as a conduit for the Raspberry Pi and the mirror, enabling the display of information particular to each user to an HDMI cord. LED stands for Light Emitting Diode. Information such as weather forecasts, dates, times, calendars, user tributes, news feeds, and email notifications can be found here. User voice commands are used to control how these details are displayed. The user can see this display thanks to a mirror that may be used in both directions and is both reflecting and reflective. Therefore, In front of the monitor, place a two-way mirror. Information can be checked while wearing makeup.

C) LED monitor connects the Raspberry Pi to the mirror and serves as an interface, displaying customized information on the screen via HDMI cable. LED stands for Light Emitting Diode. Here you will find information such as weather forecasts, dates, times, calendars, user posts, news feeds, email his alerts. User language commands are used to control how these details are displayed. The user can see this display thanks to a dual-sided mirror that both reflecting and refractive property. Therefore, by utilising a dual-sided a reflection in the monitor, you could check knowledge while applying makeup. An everyday mirror includes a reflection feature that allows only the user to see the reflection while reflecting all the light that enters the glass. A dual-sided mirror has refractive and reflective surfaces. properties, only The light is refracted and partially reflected. to pass allowing the user to see through the glass surface observe the monitor's information display.

D) Items software like, a pre-installed operating system based on Debian is called Raspbian OS. on the RaspberryPi components, made it easy for customers to program java script. This study uses JAVA Script as the programming language to display information. A prototype-based, object-oriented high-level programming language is called Java Script or JS.



Hardware Components

4. OBSERVATION

By omitting all of its internal technology, the Smart Mirror still functions as a mirror, making it incredibly easy to use and blending in with our daily life. IoT and home automation are two areas where the Smart Mirror has application. The Smart Mirror can be connected to other devices, such as mobile phones and home appliances, to increase its capabilities.

5. FEASIBILITY STUDY

By using a magic mirror with a high concentration of aluminium, you can use the smart mirror as a mirror to see

yourself like a normal mirror while changing and grooming. Time, date, weather information and news are retrieved from the Internet by Smart Mirror as information system through the specified URL. Websites such as CCN, BBC are used to collect news. Temperature and humidity data are determined using the DHT22 digital sensor. Jumpers are used to connect the DHT22 to his GPIO pins on the Raspberry Pi board. When no one is home, you can turn your smart mirror into a security system by using a VNC viewer to detect people's presence. When someone when it enters the space, the PIR sensor recognises movement of people passing by.

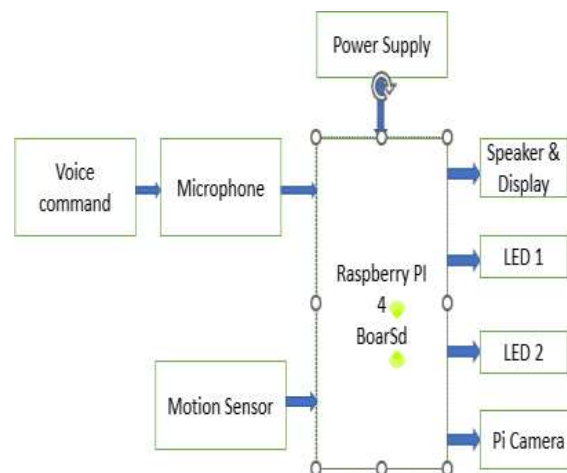
6. IMPLEMENTATION

Language inputs are used throughout modules by way of switch case statements. Each piece of information shown in The mirror has two sections: different modes that are triggered according to the user's voice input. A called is provided to each module, and where its name is pronounced, the appropriate module will be activated, executing the appropriate code and displaying the appropriate information.

Date and Time: Today's lesson is active plus a code for that section is retrieved when all customers provides speaking to a display the time or date. Depending on the region you choose, Google accesses predefined time and date formats in your code (That mirror shows dates or times based on Indian Time of Standard.

News Feed: This module activates the module's code to retrieve news updates whenever a user provides voice command to view news reports. New York Times headlines appear in this category. This data comes from Google and the Google address is provided in the code as a link. Read the latest news from the Times of New York here. whenever this module is enabled, URL would be referenced to retrieve information and updates will be fixed as soon as possible.

8. BLOCK DIAGRAM



9. CONCLUSION

By omitting all of its internal technology, the Smart Mirror still functions as a mirror, making it incredibly easy to use and blending in with our daily life. IoT and home automation are two areas where the Smart Mirror has application. The Smart Mirror can be connected to other devices, such as mobile phones and home appliances, to increase its capabilities.

10. FURTHER WORK

Each product can always use some enhancement. To keep up with the latest technology, everything must be promptly updated or upgraded. Provide a natural form of interaction so that basic voice commands can be used to operate domestic equipment like fans and lights. Since this mirror is mainly used in university environments, it can integrate simple functions such as barcode scanners and fingerprint sensors. This may

Weather Prediction: Whenever a user provides speaking to a display the weather predictions, this section is triggered or gets the code. This section shows all seasons forecasts. That data comes through google and the google address is provided in the code as a link.

7. SUMMARY OF WORK

Information must be visible on screen of Smart Mirror. Something must be able to operate the Smart Mirror without requiring direct interaction. To receive incoming data, Smart mirror must be able to access the internet. The Smart Mirror should module-based and include preset module samples. By default, the Smart Mirror system is in a low-power sleep mode. Multiple screen sizes must be supported by the Smart Mirror. Raspberry Pi Board, Face Detection Module, Voice Module, HDMI, Two-Way Mirror, LCD Monitor, Microphone and Speaker Kit, LED Lights, Stackable Breadboard, HDMI Connecting Wires, Binding Tape, and Wooden Box Holder are the Hardware Requirements for that. Software prerequisites OS Raspbian a smart and interactive mirror that provides real-time data and information updates is obtained, allowing us to receive all the necessary information and customise it to meet our needs. This mirror also includes a voice module for verbal interaction, a face detection security feature, and a motion detection feature to identify passersby.

include enrolling in programs by scanning your ID card.

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