

A Survey on IOT Based Smart Mirror Using Raspberry Pi

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Abstract

The Internet of Things (IoT) is a method where an object could transfer data through a network without the need for human interaction with humans or humans through a computer. IoT is known for its advantage in that can help us simplify human being's daily routines. Hence, the smart mirror discussed here is mainly for home automation systems. It is a concept of smart automation-based Internet of Things (IoT). This device allows users to gain information and also entertainment purpose for small kids. Relevant details can be found such as current time and today's date, actual weather. The Raspberry Pi is a medium of interaction between people and systems. The methodology used in this project is Evolutionary Prototyping which gathers the whole requirements of the device and designs the device in a quick able method. An instance is built to evaluate Improvements that will be made to the device via enhancing the prototype, as per to user's satisfaction. With Smart Mirror using the Raspberry Pi system, users can manage his/her daily routine at an easy level as well as solving many difficulties in managing house duty.

Keywords: - *Raspberry Pi, Internet of things, Daily Routine, Smart Mirror, Automation System*

INTRODUCTION

Nowadays, IoT is the highest considering method regarding all the systems and devices. The use of data highway has been

seen everywhere where we go. Approximate till the end of the year 2020, there will have been upto 21 billion devices across the world that are connected

with the 'Internet of Things' that means every human being can carry 8-10 IoT devices that have regularly connected to the Internet. Our manner of living is full of attached to the Internet that means the Internet has become the essential requirement of a human being. The growth of the Internet will result in the growth of specific data which has needed to be processed and examined. Internet of Things offers unlimited opportunities to enhance able communicating between devices and data sending and receiving but this same term makes it highly vulnerable through the point of view of security. The smart mirror is wall mounted mirror it shows details such as daily news, actual weather, current date in the calendar, and other things like entertainment for small kids and many other things related to user's needs. The main goal for building a smart mirror is to use quality two-way glass, a high-frequency LCD monitor, a wooden frame to hold the glass and monitor.

In last year's more and more devices are attached to the internet. The internet has played auspicious role in connecting more people across the globe. Devices are started to become smarter; cell-phones became smartphones and most essentially internet was connected to a collection of

devices and the idea came to be known as the 'Internet of Things. Our device aims to inspect other possibilities where this technology can be used. It aims at involving this technology in a simple mirror because in general people had spent a most considerable time in front of a mirror. We had seen clocks are arranged on the wall, at airports, comparatively, we aim to bring this technology to our sweet homes.

The smart mirror will help us in developing some off smart homes by using AI and finally locating a place in industries and many other places. The next section is about brief detailed information on the related work and the illustration of the resources and software's used with it. It is followed by block diagrams of the proposed mirror. Conclusion and future scope of the smart mirror are also discussed in detail in this paper.

RELATED WORK

Research has been made on the device which is relatable to smart mirror devices. Here are some projects and systems about smart mirrors discussed briefly their work and purpose. In 2003 Phillip unveiled their Mirror TV that was built using an equivalent principle that of smart mirrors. Their product was a traditional TV that

was put behind a two-way mirror so that the TV would seem like a mirror when turned on and as a TV when turned on. They also had a choice to have the mirror be larger than the TV. A usage example presented by Phillips was to possess the youngsters to watch cartoons while brushing their teeth at an equivalent time.

Later in 2005 Phillips announced their scientific research My Heart that built upon the thought of an informative mirror. While their main Mirror Television was simply a Television that has worked as a simple mirror, the My Heart project had to join a display to showcase different medical and other stats. However, this project required body electronics to gather and analyze the info. The mirror itself simply distributes as a detailed display.

James Law Cyber texture developed a commercially sold smart mirror in 2011. This mirror is more in line with the smart mirror we've come to understand today. The product consists of a 21"LCD-display covered by a 25" two-way mirror. The display can show weather forecasts, stream internet, TV, the present time, and various widgets. The smart mirror has numerous input methods like a remote controller, smartphone app, and onscreen virtual keyboard.

PROPOSED METHODOLOGY

The proposed system is to style an interactive futuristic smart mirror with AI using Raspberry Pi. In the proposed system, the power of the system to show details and supply details of an equivalent incorporates the idea of AI. Interactive computing, with wirelessly connected embedded devices that are getting used in various day-to-day activities. Based on this technology, many devices/products are now emerging and with this intelligence, it's providing comfortable, secure, and convenient personal services everywhere. The project aims to show all details of daily routine, daily news, and feeds, particular date, for the entertainment of kids Pokémon module is there. After this, we had made security for our glass that it would not damage the outer world by using a wooden frame as a cover to mirror.

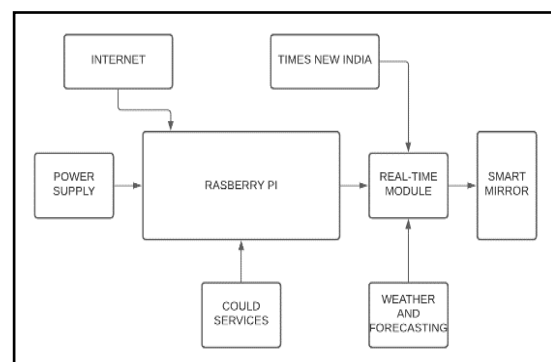


Figure 1: Block Diagram of IOT Based smart Mirror using Raspberry Pi.

1. Raspberry Pi: -

Raspberry Pi 3 B+ was released in March 2018 with a 1.4 GHz 64-bit quad-core processor, Broadcom BCM2837B0, Cortex-A53(ARMv8) 64-bit SoC, 2.4GHz and 5GHz IEEE 802.11.b/g/n/ac wireless LAN, Bluetooth 4.2, BLE, Gigabit Ethernet over USB 2.0(Maximum throughput 300 Mbps), 4 USB 2.0 ports, Full-size HDMI. CSI camera port for connecting a Raspberry Pi camera.

DSI display port for connecting a Raspberry Pi touchscreen display. 5V/ 2.5A DC power input. 4-pole stereo output and composite video port. Micro SD port for loading your operating system and storing data. Power-over-Ethernet (PoE) support. The Raspberry Pi 3 Model B+ has undergone extensive compliance testing and meets the subsequent European standards.

The dual-band wireless LAN comes with modular compliance certification. This allows the board to be designed into outcome with significantly reduced wireless LAN compliance testing, improving both cost and time to plug. The design flaw was fixed in revision 1.2 of the board, released in late 2019.[5]



Figure 2: Raspberry Pi 3B+.

2. One-Way Mirror Film: -

A 2-Way mirror may be a complementary mirror that is moderately transitive and somewhat reflective the perception of one-way transmission is achieved when one side of the mirror is brightly lit and therefore the other side is dark. The target of designing the mirror is to supply a natural interface within the ambient home environment for accessing various services like location-based weather, time, calendar, etc. also as provide access to using Voice Services. The project includes downloading the Raspbian OS supported Debian and extracting the image on the SD card, inserting the cardboard within the Raspberry Pi SD slot a then performing the specified steps.

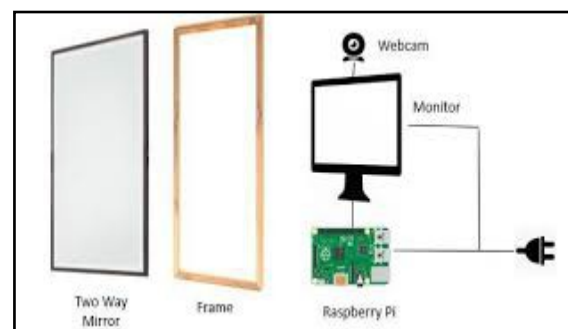


Figure 3: One-way mirror.

3. LCD Panel: -

An LCD panel is an output device that displays information within the sort of photographs. The monitor normally consists of display devices, circuit loops, and electric supply. An LCD panel put down behind the glass mirror is used to represent to the user the expected interface. LCD monitors are flat panel display which uses an array of sunshine emitting diodes within the sort of pixels for display screen. They're allowed to be utilized in outsource due to the brightness where they are often visible to the sun store signs and billboards.



Figure 4: LCD Panel.

4. Raspbian Operating System: -

Raspbian Is the Best All-Around Operating System. Raspbian is that the "official" OS of the Raspberry Pi and since of that, it is the one most people will want to start with. Raspbian may be a version of Linux built specifically for the Raspberry Pi. Raspbian

may be a free OS supported Debian optimized for the Raspberry Pi hardware. An OS is that the set of basic programs and utilities that make your Raspberry Pi run. Few steps will apply to the installation of this Smart Mirror by using Raspberry Pi. First, we have to install the Raspbian stretch, and then boot the Raspberry Pi. Remove the SD card from your computer desktop and place it into your Raspberry Pi. Connect your keyboard, mouse, HDMI cable, and, lastly, the Pi's power line. After that, you will now see the Raspbian Pixel desktop interface. This "Smart Mirror" needs to be Wi-Fi-enabled so that it can connect to the internet and so that we can access it remotely through VNC Viewer to set things up. In the upper side right of your monitor screen, press on the network-like icon. Select your network enters your Wi-Fi password, and click OK After that, find the IP address so this can be connected to it from any regular computer and complete the rest installation from there. Lastly, we start our "Smart Mirror" on system boot with appearing of all features that include.

RESULTS

As we had seen in the comparison table that every mirror is working on different technologies and platforms. These mirrors also differ in functionalities and users. We

had proposed a mirror that works on a common architecture and also had all the required functions for users

ADVANTAGES

1. **Attractive LightBox:** Ordinary lightbox is just aboard.
2. **Very Low Power Utilization:** It consumes very low power.
3. **Easy to relate:** It grants the user to interact with the system using different means.
4. **User-friendly:** it'll be one among the primary Smart Mirrors you'll interact with and also one of the primary smart mirrors to allow you to install apps as per our choice.

DISADVANTAGES

1. The limitation is that the app ecosystem is currently very small, the glass might be more reflective but it is often easily changed swipe gestures are sometimes unreliable.
2. The hardware and software more detach because current the detector and microphones are tied to the software and it is often difficult to form the OS to work with different hardware

CONCLUSION

Smart mirrors have great potential to enhance the user experience of accessing and interacting. With the assistance of this literature survey, we aim at designing a sensible mirror that gives an ambient environment between users and therefore the internet. It will help the users in their daily activities. The smart mirror also can be implemented in various industrial and residential applications. Hence IoT proves bent be a crucial technology for creating household appliances smart.

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