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# Making Smart Mirror and Interactive using IOT

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**Abstract:** *There is never an end to devices that can be made smarter with the help of adequate technologies. A smart mirror is a system that functions as a mirror with some additional features including date, time, current temperature, weather details. This paper represents the design and working of a smart mirror using Raspberry Pi. All the features are displayed on a monitor which is covered with a sheet of two-way mirror. The monitor is enclosed in a wooden frame. The computing is done with the help of Raspberry Pi.*

**Keywords:** *Raspberry Pi, Smart Mirror, Monitor, Two-way mirror, Internet of Things.*

## I. INTRODUCTION

In today's world, people need to be connected and they are willing to access information easily. Whether it is through the television or internet, people need to be updated about the current affairs happening around the world[4]. The internet has played an important role in connecting more and more people across the world. Devices started to become smarter and smarter, mobile phones became smartphones and most importantly internet was connected to a variety of devices and the concept came to be known as the 'Internet of Things'. 'Internet of Things' means interconnection via the internet of computing devices embedded in everyday objects, enabling them to send and receive data[2][7]. Our paper aims at including this technology in a mirror.

In general, people waste a numerous amount of time in front of the mirror. We can utilize this time with the help of smart mirror as we can know the time and temperature while being in front of mirror. For building a smart mirror we use a high quality two-way glass, a monitor, a frame to hold the glass, and a web browser with JavaScript to provide the software features and drive the display[1]. This mirror displays information such as time, date, temperature, weather, news and other interest of fields. The smart mirror would help in developing smart houses by using artificial intelligence and finally finding a place in industries.

## II. LITERATURE REVIEW

In the recent year, technology has become an integral part in day to day lives. Technology has been incorporated in many electronic devices. But the motive of designing a 'Smart Mirror' is to bring technology in a traditional household mirror and make it smart. This brought in a new definition of a smart mirror, "a smart mirror is a mirror with additional features and functions, with the aim of introducing capabilities for human interaction". [8] The Smart Mirror includes some devices equipped with a raspberry pi. As the technology and application of digital system is getting popular, the work on this field is increasing.

A Smart mirror consists of a display monitor which displays the necessary sufficient information that the user utilizes. The smart mirror acts as a normal mirror in which grooming and looking can be done. The smart mirror also acts as an information system through which we can know the date, time, weather. The concept of smart mirror revolves around the development of Internet of Things[5]. The mirror has the ability to display date and time, news updates, weather conditions, to-do lists, reminders, traffic conditions, etc. With the help of IoT, a mirror can be upgraded to perform as browsers. Raspberry Pi is used for computing which does not require large space.

## III. PROPOSED SYSTEM

The proposed system is to design a smart mirror using raspberry pi. Our paper plans to exhibit a smart mirror which provides modern experience to the user. Smart mirror consists of two-way mirror, Raspberry pi, Monitor, Microphone, Camera, wooden frames. The raspberry pi is the most vital part of the mirror, it forms the processing unit of the mirror. The programming of pi is done using javascript language[1][7]. The project aims at creating a smart system for users where it detects face. The mirror will recognize user's face and it will be processed using Raspberry Pi and display user's feeds. User's image will be stored in database.[3]

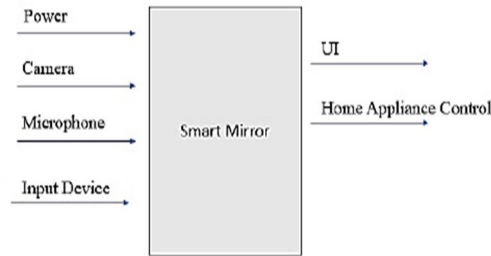


Figure 1: Basic Structure of Smart Mirror

#### IV. HARDWARE REQUIREMENTS

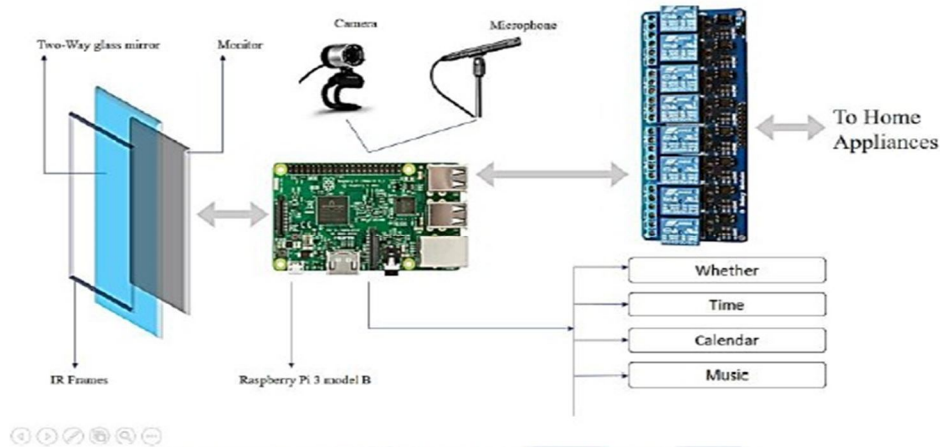
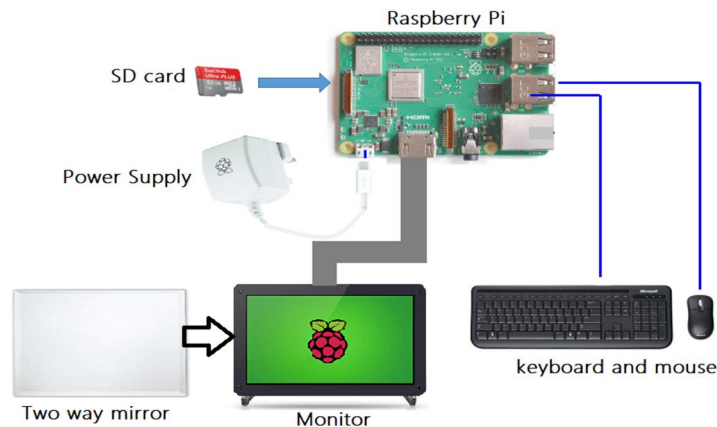


Figure 2: Design of Smart Mirror [2][3].



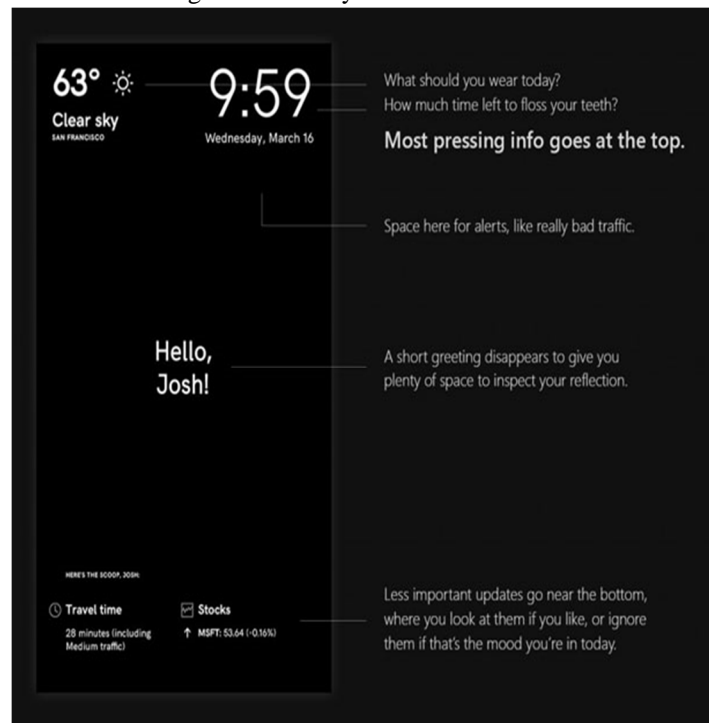
- 1) *Two-way Mirror*: The two-way mirror is what gives the mirror its real identity. It's really magic mirror as it has reflective surface at one side and also its transparent for light with good intensity. The mirror stays at the front where the user can watch himself/herself in the mirror at the same time it allows the light from monitor to pass through it and make available the UI.
- 2) *Monitor*: The monitor is directly connected to Raspberry Pi via HDMI interface thus providing display. For providing touch ability to monitor IR frames are used which are explained further in next sub-section.
- 3) *Wooden-Frames*: The Wooden-frames provides the touch interface to the smart mirror. The wooden frames connect to Pi via USB interface. Thus making smart mirror touchable.
- 4) *Raspberry Pi 3 Model B*: The raspberry pi is the most vital part of the mirror, it forms the processing unit of the mirror. The Pi is like motherboard having all the required constituents which forms a great CPU. Its size of a credit card and still it can perform like a full-fledged computer. The programming of Pi is done using Javascript language.



Fig: Raspberry pi 3 model b

### V. RESULT AND OUTPUT

The output of a smart mirror is a black screen which displays date, time, weather. The top right corner of the screen displays date and time while the top left corner displays the weather and temperature. Weather condition update changes every hour and is displayed on the screen if there is a change in temperature else the temperature remains unchanged. The updates that are less important are shown at the bottom which can be ignored or delayed.



### VI. CONCLUSION AND FUTURE WORK-

Smart mirrors have great potential to enhance user experience of accessing and interacting with information. It will help the users in their daily activities. Our smart mirror saves time and makes it easier to access information. The future work on this project can be adding more widgets such as e-mails, social media applications, traffic updates etc. The mirrors can be better enhanced to be deployed in beauty parlors, cloth shops, hotels, etc. with better advancements in technology, mirrors can be used in many other fields. [1][11]. In future this mirror can be used to build smart home network with devices such as morning alarm, sleep alarm and any type of reminder alarm.[9]





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