

INNOVATIVE MIRROR USING RASPBERRY PI WITH GOOGLE ASSISTANT

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Abstract – In today's society, information is available to us at a glance through our phones, our laptops, our desktops, and more. But an extra level of interaction is required in order to access the information. As technology grows, technology should grow further and further away from the traditional style of interaction with devices. In the past, information was relayed through paper, then through computers, and in today's day and age, through our phones and multiple other mediums. Technology should become more integrated into our lives - more seamless and more invisible. We hope to push the envelope further, into the future.

We propose a new simple way of connecting with your morning newspaper. We present our idea, the Smart Mirror, information at a glance. Our system aims to deliver your information quickly and comfortably, with a new modern aesthetic. While modern appliances require input through modules such as keyboards or touch screen, we hope to follow a model that can function purely on voice. We seek to deliver your information during your morning routine and throughout the day, when taking out your phone is not always possible. This will cater to a larger audience base, as the average consumer nowadays hopes to accomplish tasks with minimal active interaction with their adopted technology. This idea has many future applications, such as integration with new virtual or augmented reality devices, or simplifying consumer personal media sources.

Key Words: Two Way Mirror, Raspberry pi3, Google Assistance

1. INTRODUCTION

The world around is developing interactive computing that People are today getting more involved with technology as it evolves rapidly with new technology constantly hitting the market. Big companies which collect tons of user data can easily facilitate people in their everyday life struggles. As the number of smart products increases, the need of connectivity between products is becoming more important and pushing a higher demand on suppliers to optimize user experience. Smart products refer to products which combines a physical product with additional services such as

integration of information and communication technologies. This leads to the development of technical centers where users can access and administrate their data/smart devices in a collective space which is easy to use. These centers have potential to be evolved in an environment called smart mirrors which is a part of smart products. The hypothesis is that a mirror is an ordinary product which exists in more or less every person's home.

In our rapidly developing world, information is always right at your finger tips - on your phone, on your computer, maybe even on your watch. Staying connected with new information is both important for entertainment and daily life. With such a variety of options, there is difficulty in following all of your data streams. Often, during your day, you may end up in a position where it is inconvenient, or even impossible, to take out your phone or computer and check the newest update. You cannot commit to a slower interaction. You need a display to glance at, with the information you need ready to go. However, aesthetics are just as important as displaying information. Keeping an extra computer in your bathroom or hall would be inconvenient, and would not fit well with the look of a modern room. A sleek, simple display, easy for an average consumer, is a necessity in today's world.

The goal of the smart mirror is to provide an access point for a person to receive all the information that could affect how they plan for the day. For getting news updates and weather updates, a person will always have to switch on the television which is time consuming. To get rid of these problems, the concept of smart mirror is introduced. All the necessary information like weather and news can be accessed from one location. The problem of a secured user authentication technique can also be corrected by this system. Through the use of LCD displays and a two way mirror, weather, time and date, news, and other useful information programmable through the smart mirror app would be available at a glance.

2. SYSTEM ARCHITECTURE

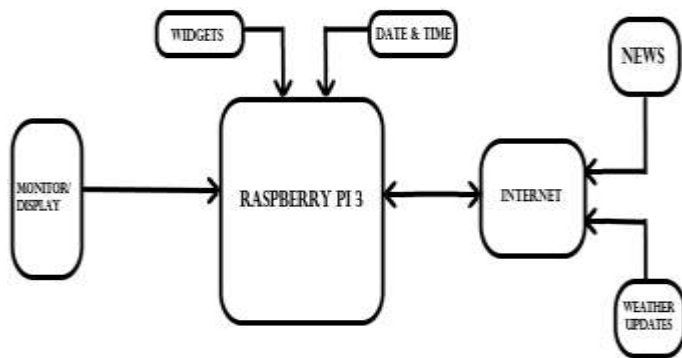


Fig -1: System architecture

The System architecture of Smart mirror is shown in above figure. The Smart mirror system mainly consists of three parts; a two-way mirror, LCD monitor and Raspberry pi. The two-way mirror is the mirror which is reflective on one side and transparent on the other side. There will be a webcam behind the transparent side so that it can capture and identify faces for security purpose. The LCD monitor is used for displaying different widgets on the mirror. The LCD monitor will be connected to the Raspberry pi. The Raspberry pi will be used for programming of different widgets using Python language. The Smart mirror will be switched on using a voice command such as "Hello Mirror!", "Good morning mirror" or any other keyword. The Smart mirror will also give voice as well as text response like greeting the user or give some compliment as response, for which the system will use system compatible microphone and speaker. This process programming will be done for displaying images which will be displayed on LCD monitor and user will be able to see those widgets on the mirror when the Smart mirror is switched on using the keyword. The Smart mirror will also display some personal basic information only by recognizing the user's face.

3. HARDWARE

3.1 RASPBERRY PI 3

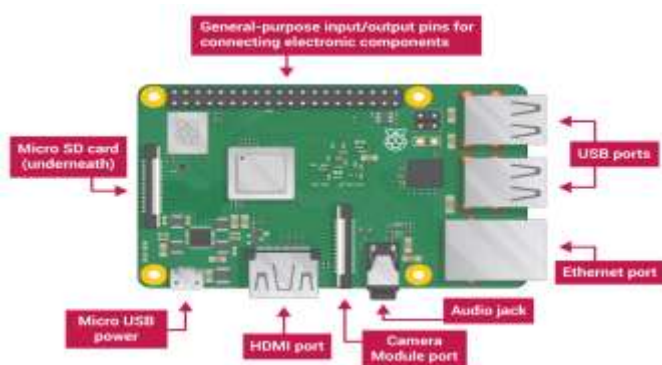


Fig -2: Raspberry Pi3

A Raspberry Pi is a credit card-sized computer originally designed for education, inspired by the 1981 BBC Micro. Creator Eben Upton's goal was to create a low-cost device that would improve programming skills and hardware understanding at the pre-university level. But thanks to its small size and accessible price, it was quickly adopted by tinkerers, makers, and electronics enthusiasts for projects that require more than a basic microcontroller.

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 Python language. The programs can be first developed and compiled on windows or any other platform and then can run on Pi. The Pi also has its own inbuilt IDE to program in languages like C++, Python, C, Java, etc. Installation of OS on Raspberry Pi is quite a simple process.

3.2 TWO-WAY MIRROR

We are using a two way mirror for display purpose. It is an important part because it helps in design innovative display. It will be attached at the top to a wooden frame which is used for the support to the monitor. We are using a monitor which is connected to the raspberry pi using HDMI cable. One way to interconnect with the mirror is microphone. Voice commands for appliances control will be given using microphone. This mirror acts as a normal reflective mirror when the mirror is off and the data is displayed simultaneously when the mirror is turned on.

Traditional mirrors are created using a process called silvering, in which a coating of a reflective material (such as silver, tin or nickel) is applied to the back of a pane of glass. After a layer of copper is added to prevent oxidation of the metal, a layer of paint is applied. It serves two purposes: to protect the reflective coating, and to ensure that all light is reflected forward to the person standing in front of the mirror—which means that it's impossible to look through a regular mirror.

The trick of the two-way mirror is accomplished through manufacturing and lighting. To make this type of mirror (which are also sometimes referred to as one-way mirrors), a thin layer of metal—usually aluminum—is applied to the front of a pane of glass. The layer is so thin that only half of the light that hits it is reflected back; the rest goes through the pane. There are many uses for two-way mirrors besides interrogation rooms, including teleprompters, scientific and marketing research, security cameras, and to create various stage effects.



Fig -3: Two-Way Mirror

3.3 GOOGLE ASSISTANT

Routines are among the most useful features of Google Assistant. They enable you to string together multiple tasks you do every day from checking the weather to adjusting your thermostat and activate them all with a single voice command. There are several pre-configured Google Assistant routines available. Routines throughout your day. Say one command and your Assistant can do multiple actions.

For example, if you say:

“OK Google” tell me about the weather, play music or news, and more.

“OK Google, let’s play music,” your Assistant will play music.

“OK Google” your Assistant can set an alarm.

Smart Mirror with Google Assistant it's a voice control Smart Mirror, displaying your all basic information like weather, notification, News & daily updates, Date and Time etc.

4. RESULT

An innovative smart mirror system has come up with various information'. The image below display the required output in which we can see that it is displaying Time and Date, Weather conditions, News and appointments, timer, to-do-list, music etc.



5. CONCLUSION

The Smart Mirror that is used here makes our lives even easier by implementing the smart Google Assistance. Here the Google Assistance helps us to open the browser, which can open the documents or an article through the voice commands. The highlight of this smart mirror is, by using the Google Assistance skills we can simplify and use the mirror in a smart way and efficient way. Google Assistance Skills can be altered in future for further implementation of making the smart mirror function efficiently and smartly. The Google Assistance and the Raspbian component can be alone taken out and be fixed to any other devices to make it more interactive and smarter instead. Example: we can use these components in car mirror, which makes the driver to interact with his/her mirror without using their phones on hand and get distracted while driving

6. FUTURE WORK

The future work on this paper can be adding more widgets such as e-mails, social media applications, traffic updates etc. For security of these widgets iris detection can be used along with thumb impression for accessing mails and personal data. Artificial Intelligence can also be added as an extra feature for recommending news according to the user's choice, suggesting the best path to reach the destination according to the traffic or suggesting clothes and accessories according to the climate conditions.

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