INFORMATIVE MIRROR

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***Abstract*: An informative mirror combines the use of traditional mirror with digital aspects to bring up-to-date information to the user directly on the mirror surface. This information is simple like time, date, weather, calendar and news. There are almost endless possibilities to what can be programmed on a smart mirror. By connecting IoT to smart mirror, it is possible to implement a variety of application services. Smart mirror that has been linked with IoT platform is friendly and provides varieties of information to user. These features of the mirror will be scraped from the Internet and implemented using the raspberry pi board. The pi board is programmed with the Raspbian operating system.**

***Keywords*: Smart mirror, Internet of things (IOT), Raspberry pi**

Introduction:

Everyone knows what a mirror is. It is an object found in most peoples homes. In mirrors we see our reactions. But what happens when you combine the idea of a mirror with technology? What possibilities are there and how smart could a mirror be? Our aim is to develop a smart mirror and a small operating system to power it. The device was to go beyond an ordinary mirror, to have a screen inside that you would be able to interact with by using voice commands and smart phones or other devices. There are many benefits of using an informative mirror. It makes life easier as the need to look at phones every time we need to check the date or weather is reduced. We have all the information that we need right in front of us. The informative mirror can also be upgraded to display browsers and social media websites. Adding a motion sensor to the mirror will further increase the speed and ease of use. The smart mirror must over benefits of using modern technology while integrating seamlessly into the standard routines of most people. The informative mirror must be simple and as intuitive as possible. The informative mirror would be used to merge two or more technology and the need for information into any ones daily schedule. With the mirror in place, the user could interact and obtain the information they want during their normal morning and night routines. System collects real world machine data and the data would be transmitted from the machine and would be managed by the Raspberry Pi. The Smart Mirror implemented as a personalized digital device equipped with peripherals such as Raspberry PI, mouse, keyboard etc. Below figure 1 shows a normal mirror when no information is provided on the mirror and when we require an information how it will be shown on the mirror. Till the time there is no information the mirror acts as a normal mirror and when some information is displayed it acts as an informative mirror. So we can look at the mirror for getting ready as well as just by giving some voice commands can also see the informations we required like date, news weather or our reminders/schedules of the day.

Figure 1: Informative mirror demo

Literature Survey:

This paper consists of the smart mirror implementation with LCD touch screen which has features like news feed , weather update ,multimedia ,light control, cabinet ,security camera. The presentation of personalized weather data, time, date and will incorporate some additional functionality, like reminder service by mobile synchronization and through social media. Our framework is based on detecting presence of human using Passive Infrared sensors and Wi-Fi connectivity. Once a person comes

in front of the mirror, it displays the information that is being fed from the phone. This data or information includes calendar, time, weather, news feed, notifications and so on. [1]

In this paper, the author has added the features in the smart mirror like plasma panel display, LED lighting, speech recognition, camera, Bluetooth module. The mirror provides a natural means of interaction through which the residents can control the household smart appliances and access personalized services. Emphasis is also given to ensure convenience in accessing these services with a minimum amount of user intervention. For example, face recognition-based authentication is used to automatically identify the user facing the mirror and provide widget-based interface to access data feeds and other services. [2]

In this paper, the author has implemented the smart mirror with features like internet, music ,weather update, news, face modified time, memo, the normal mirror has been transformed into a magic mirror according to the author.it also has a 3D virtual intellect. Intelligent mirrors are not only used on mobile phones and tablets computers, but also more and more intelligent mirrors are coming into being. At t 3D mirrors are expensive, and are limited to use in public places. in this paper, an intelligent mirror based on raspberry pi is designed for the home of IoT. [3]

This paper consists of the smart mirror features like face recognition, health monitoring, emotion recognition , personal information ,multimedia ,voice, touch gesture. The Magic Mirror can be easily implemented in existing personal computers or hand-held device with normal peripherals and regular reflective glass by integrating image speech processing, Internet connectivity, 3D and multimedia software. The integrated Magic Mirror, which includes speech recognition, speech synthesis, face detection modified recognition, 3D virtual genius, hidden LCD mirror, and camera, performs simple syndication to capture information about peripherals and network connections.[4]

Motivation:

Effective time management is one of the most important factors for success and productivity in a persons day-to-day life.

With the increasing integration of technology in our lives, maintain- ing an efficient schedule has become both easier and more difficult. Keeping up to date with appointments, news, social media, and other things is made easier through technology such as tablets, PCs, and smart phones yet also pro- vide distractions that can interrupt anyones routine. Technology has become another task in the day that time must be allotted for. In the finite time of the day, technology needs to be designed to work within our schedule and not be an extra piece to it. Anyone in the business or academic world would agree that every second counts in the day. This project was formulated through inspiration seen through movies such as Iron Man and tech demos, such as Samsungs transparent LCD Smart Window, seen at the International Consumer Electron- ics Show in 2012. This extends as well to the continuing trend of integrating touchscreen and internet-connectivity into everyday appliances such as ovens and refrigerators. The idea of a smart home is the direction lots of compa- nies are heading and while the kitchen has been getting lots of attention, the bathroom has not.

Besides the kitchen, the bathroom is one of the busiest rooms in the home, so it is an excellent place to expand the smart home next.

Methodology:-

The goal of the Informative Mirror is to provide a single easy to access location for a person to receive all the information that could affect how they prepare for the day.

Through the use of display and a two way mirror, weather, time and date, and news are available at a glance.

The microphone is connected to the RPi to accept Voice commands, according to the voice commands RPi will Show you the result on mirror.

A user friendly interface, accessible from any Wi-Fi enabled device, allows the user to easily setup the connection to their home Wi-Fi, change the location from which they receive the weather, and select a source from which to receive the day's headlines.

Additionally, Picamera is used for security purpose for schedule accessing using face recognition concept.

By building these features into a mirror, which most people will already be using in their morning routine, it is possible to present this information in such a way that it will seamlessly blend together with the task of morning grooming.

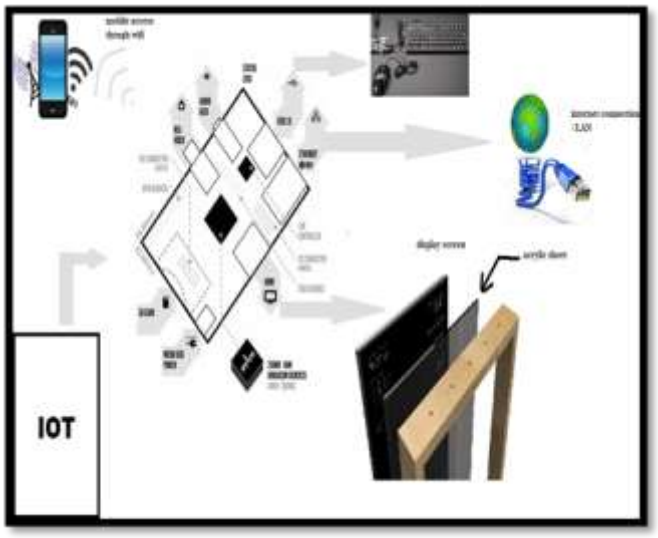

Figure 2: Architecture of System.

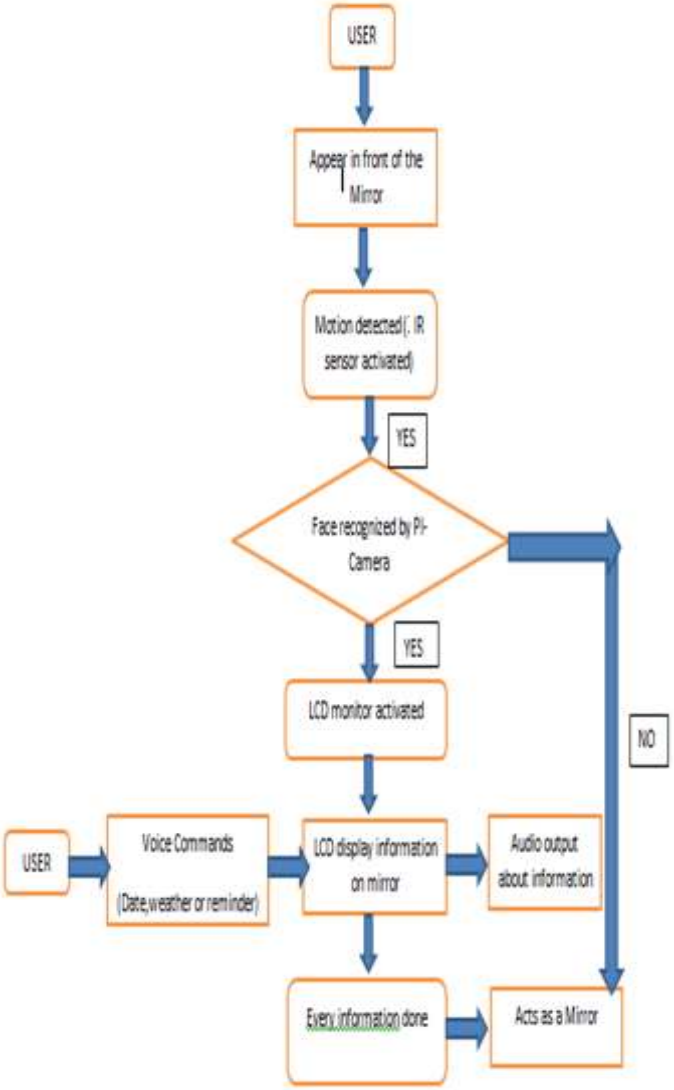

Figure 3: Flow chart of Informative Mirror

Components Required:

1. Raspberry Pi 3 Model B+:

Fig 4. Raspberry Pi 3 Model B+

The Raspberry Pi is a series of small single-board computers. This mini-computer has all necessary elements on board. It is cheap and very use full. It runs on Raspbian OS. The Raspberry Pi 3 Model B+ is the latest product in the Raspberry Pi 3 range, boasting a 64-bit quad core processor running at 1.4GHz, dual-band 2.4GHz and 5GHz wireless LAN, Bluetooth 4.2/BLE, faster Ethernet, and PoE capability via a separate PoE HAT.

2. IR sensor:

An infrared sensor is an electronic device, that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. These types sensors measures only infrared radiation, rather than emitting it that is called as a passive IR sensor.

Figure 5: IR sensor

3. **Two Way Mirror:**

The display used in the system is mirror (two-way mirror) placed in front of LCD screen.(acrylic material)

Fig 6. Two way mirror showing information

4. Mini Mic:

It is used to providing the commands to the mirror. In this system we use Lipiworld USB mini mic. According to the voice command the information is displayed on the mirror.

Fig 7. Mini Mic

5. PI-Camera:

The Raspberry Pi Camera v2 is the new official camera board released by the Raspberry Pi Foundation.

The Raspberry Pi Camera Module v2 is a high quality 8 megapixel Sony IMX219 imagesensor custom designed add-on board for Raspberry Pi, featuring a fixed focus lens.

It is used for the face detection purpose in the project. It captures the images.

Figure 8: PI-camera

Conclusion:

The Informative Mirror designed in this project will provide the user with an enhanced mirror experience. By making use of multiple displays, the user can stay updated on the time, weather, and news headlines while preparing for the day in with the fully functional Smart Mirror. Although there are other smart mirror technologies that are available, the Smart Mirror created in this project stresses saving cost and flexible usage. Through an easy to use interface, the mirror can be easily setup to display data that conforms with their desires .The mirror is able to connect to the internet and parse the proper data to display. The IR sensor ensures that the mirror will always turn on when a person steps up to use it. While the Smart Mirror will need to be more polished and have a few changes made before it can be a viable product to be sold, but the Informative Mirror made in this project meets all the design goals set forth before the project and has all the elements that would be needed for a fully functional Informative Mirror product.

Future Scope:

Based on the encouraging results from Informative Mirror project and its benefits. We gather the information about other services needed for the user. We gather the requirement information from users and try to much more modules to the project in future. The modules may include attaching social networking sites to the mirror and logging into the respective accounts by recognizing users face. We also gather information regarding different dressing styles and add it to the mirror so that it can predict which type of dress suits the user better. The scope of the services includes personalized services and remainders which reminds the users regarding the medical prescriptions they have. There is also scope for other kind of entertaining modules which can play videos, music etc. In future we can also add gesture controls and temperature sensors which predict the temperature of room and also control lights and fans in the room. There is no end for creativity and advancement in the technology. Sky is the limit for IoT.

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