IMPLEMENTATION AND ANALYSIS OF SMART REFLECT EMPLOYING IOT

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ABSTRACT

This paper reports the design and development of a cutting edge smart mirror. It represents a prominent interface for the ambient environment. It presents the functioning of the smart mirror. The project mainly focuses on providing an easy and interesting entity for dwelling a place. The introduced smart mirror is operated employing raspberry pi and will be coupled to the real world through the internet. It comprises of a raspberry Pi, led, monitor, Speaker, two way mirror, acrylic glass. It will foreground some fundamental amenities like date, weather, and time. Moreover it performs advanced functions like Google assistance, Google photos. Smart mirrors are widely used in North America and US countries to attract a large number of customers in retail shops and also in hospitals to display useful information, Further many applications can be implemented in Smart Mirror. Solar energy can also be used to power up raspberry Pi. Touch screen technology is added, and can attract more and more people towards its outstanding feature. The smart mirror is newfangled technology that helps users to access mirrors like a feature in mobile phones.

Keywords: Smart Mirror, Raspberry Pi, Voice recognition, Weather, Time, Google News, IoT (internet of things), Privacy of data, Human detection, PIR sensor.

INTRODUCTION

Technology plays a vital role in a Individual's life.Future generation will witness the demand for smart technology.Smart Mirror will act as a door to the new technological world.smart mirror combines mirror properties with AI.This is resourceful. This project we use Raspbian software,a fundamental requirement to start with. A mirror with a magic behind it. This magic is possible due to booming methods in electronics IOT and AI. It serves time, whether,date, Google assistance,touch technology. This technology is driven by Raspberry pi.. Smart mirror can be operated in 2 modes: when switched on it operates as smart mirror and when turned off it takes a form of standard mirror. A touch screen feature can also be added to enhance bandwidth of application. The mirrors developed by leading companies made a huge impact in the market.The benefit of this is ease of use and a path to explore technology in a unique way.

LITERATURE SURVEY

The proposed smart mirror represents multiple features and personalized services for an ambient home environment

This is an effort to contribute towards a smart environment using basic raspberry pi .In this project we are using raspberry pi 3 which is Inturn connected to the wifi and all the information programmed and coded will be displayed on the mirror.

Chidambaram Sethukkarasi et al. (2016) created a smart mirror that could identify the users based on their height, emotions and facial recognition and also gives suggestions on the type and colour of the garments the users can wear but this paper does not go in depth but is rather a superficial concept to unite the ideas of a smart mirror .

GriffinTechnologies unveiled their take on the smart mirror at the 2017 CES convention. This mirror serves as a smart home hub for several smart home applications. It can display date, time, day, weather and can notify it to your phone. All the Interface can be customized through an app that was also controlled by Griffin technology appliances.

In 2016 Microsoft released details on the smart mirror they have been working on.Their main intention is not to commercialize it but to put out the details to the world on how to build them and they made the code publicly available to the users at a Github repository. The users can hence make it like a project and add special features based on their creativity hence making it personalized and user friendly.

At the 2014 International Consumer Electronics Show (CES) Toshiba showcased their smart mirror concept.it showed the usefulness of Smart Mirror in different home conditions and environments. It mainly aims at customizing the smart mirror such a way that it would serve each room in the house based on the requirements of the owner. It also has gesture control as an input method

PROPOSED SYSTEM

Smart mirror is Raspberry pi based publicize. The Raspberry pi smart mirror, could be a futuristic digital mirror and displays the efficient information within the existence of the user. Within the proposed system, Raspberry pi-3 is employed. Smart mirror is largely a mirror with a screen behind it. That screen will be an android tablet or a computer monitor or LCD Monitor. When the user stands before of the mirror the personalized information are going to be displayed.
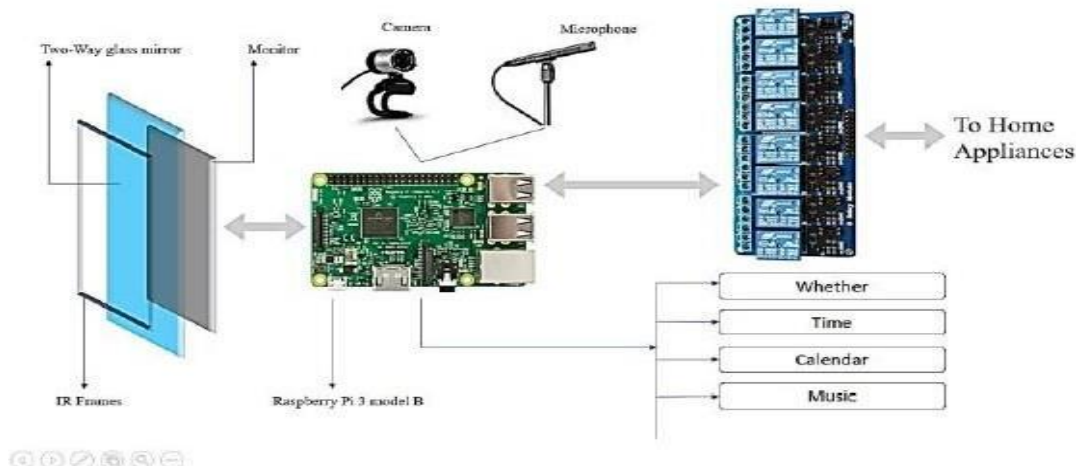

Fig1.Smart Mirror connection diagram

The personal plan of events and also the updated weather reports, current temperature is obtained.. For displaying, it's done by using Internet of Things (IoT) circuitry.

Our project phases are defined broadly in four categories, consistent with scope of labor involved in each: Design, Microcontroller programming, Display Programming and Fabrication.

• Design:

1).Dimensions:The first and most significant of our design phase was to make a decision the scale of our mirror.20"*30" dimension.

2).Frame Construction: Next, it became necessary to style a frame to contain both the mirror and also the suit Of electronics behind it. A wood frame being standard for many mirrors, we looked to the present material for a design solution. Wooden 2*3 box frame.

3).mirror material: Two -way mirror (easily shines through the glass) and native glass. 20"*30" Annealed Two way mirror.

4).Microcontroller type: Raspberry Pi 2

5).Display elements: These include the visual applications that we elect to create our display. Date, time and weather display widgets. • Microcontroller Programming: "Kiosk Mode" to realize the minimalist display of our smart mirror,it was first necessary to program the controller during this "Kiosk mode". Microcontroller Boots "Chromium" browser in kiosk mode upon startup.

Display Programming: "web page" the online page is where the smart mirror display actually exists.To begin creating it,we first had to download a server application. After finishing, we created a enter which to enter the HTML coding that will form the particular display. Locally hosted web content on the pi containing date, time and weather widgets.

Fabrications: wooden frame,Two -way glass and electronics (display monitor,pi and power bar).

IMPLEMENTATION:

We plan to design and develop the smart mirror that represents an elegant interface for glancing the information. Our project is mainly composed of Two-way mirror, acrylic glass, monitor (LED), Raspberry pi, Raspbian modules, and SD formatter. A wooden frame is to be made ready and fixed with suitable electronics behind the mirror with raspberry pi. The power supply is connected to raspberry pi. Once the mirror gets activated it will connect to the docker which contains all API which is needed to run the monitor. Where it requires internet access which will be produced by WI- FI module on the Raspberry pi.
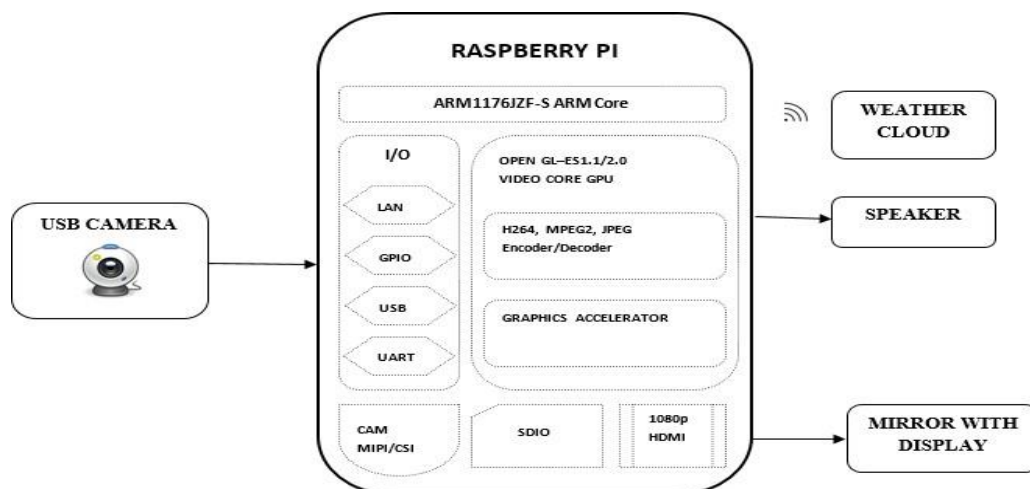

Fig.2 Smart Mirror flow chart

The implied layout that will be prepared using HTML and CSS will be displayed on the mirror when it is turned on and will display calendar, weather and news headlines. The Docker will contain the API of Alexa that will acknowledge to the users voice. The software will be carried out on java and python.one by using Internet of Things (IoT) circuitry.

Alternative technology wifi has been utilized to establish communication between user and system. The mirror can be operated in two methods when turned on it behaves as a Smart Mirror delivering all useful information and when turned off acts as a normal mirror

The proposed smart mirror will perform these tasks:When the person appears in front of the mirror is activated and will show the welcome message to the user.

After activating the mirror will display date, time, weather and news headlines.

The mirror will also play music and show our daily schedule

Smart mirror can communicate with verbal commands, functions and listen user questions and respond them adequately

The mirror will automatically sleep if a person disappears from the mirror with the help of a sensor.

SUPPORTED PLATFORMS

The smart-mirror is fully compatible with the subsequent operating systems. Note that atiny low number of features require GPIO, devices without this cannot be able to make the most of those features.

- 🍓 Raspberry Pi OS
  - Pi 2
  - Pi 3
  - Pi 4
- 🐧 Linux (Most major distributions)
- 🍎 OS X >= 10.8

RASPBERRY PI

The raspberry pi used has a quad core of 1.2GHZ broadcom 64bit CPU and also a 100 base ethernet.The word base refers to baseband signalling .There 40 pins extended GTR which is used to make connections between raspberry and external world.There are 4 USB ports used to connect keyboard, mouse , etc

In a SD card is inserted into a slot for downloading raspbian software.All the information in the card will be stashed using a software.After erasing all the information in the SD card , raspbian software is written into it.
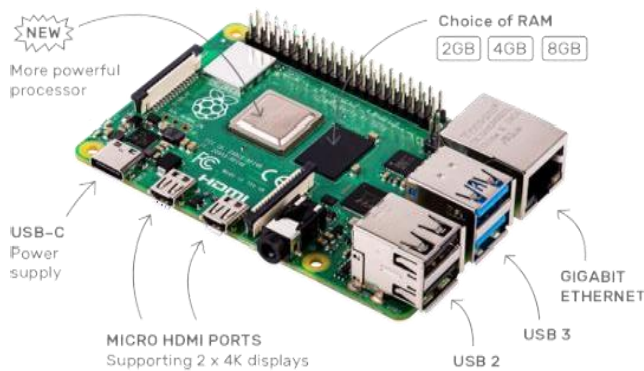

Fig3. Raspberry pi board

It is then inserted into a raspberry pi micro SD card. Both the raspberry and desktop are connected to a common wifi to establish connection between them.Code for Smart Mirror is composed and dumped on the software.Once all the connections are made and when the software is hit run, a beautiful and attracting window is displayed to all the end users

CONCLUSION:

With the evolving technology in today's world, everything that has ever been invented has taken a step further in making life easier for us. Hence, Smart mirror is one such evolution of a mirror which is not any
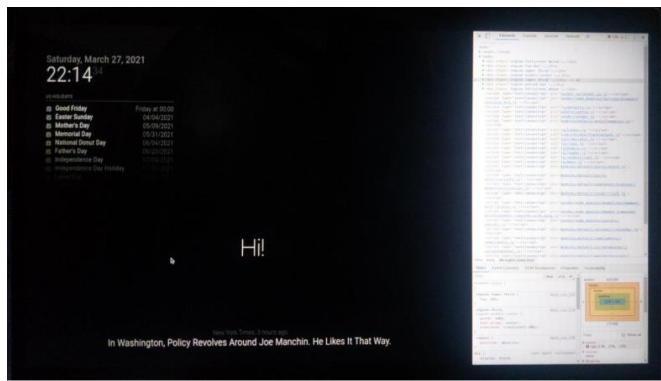

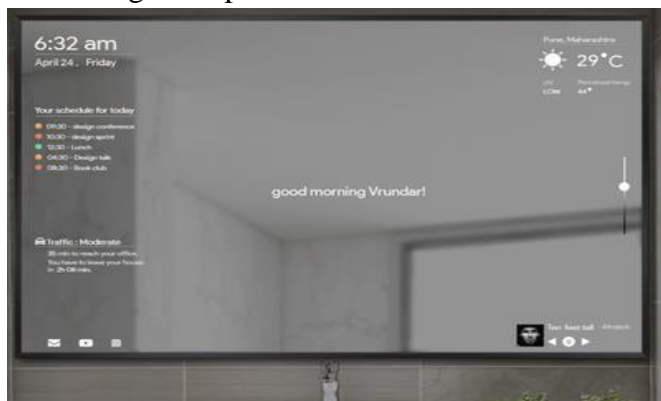Fig4. Output screen on the monitor

Fig 5. Expected output on the Mirror

Longer boring but includes a great potential to reinforce a user's experience by making it fun and interactive. With the evolution of Smart Mirror, humans who spend an outsized amount of your time preparing can now do something productive simultaneously.We have been aiming at providing all the important information like date, day, time, news feed, reminders and alarm

We also are planning on implementing alexa or google assistant to the current project so on make it effective and simple to access by voice recognition techniques

This project will have a high demand within the future,Hence we will make it available for common people by placing it in public places and by including special features like GEO-locations and thief detection which will be useful for the people of today's and tomorrow's world

FUTURE SCOPE

Integration with Amazon Alexa:
One specific application of our device we wanted was to integrate the merchandise with Amazon's Alexa, a really popular smarthome device. We aimed to possess the merchandise be ready to display information that the Alexa would return, upon a user'srequest. After further research, we realized that there have been no applicable solutions to the present implementation, because the only

Feasible option would be to own an outwards facing IP address, which can't be done on the college network. We believe that within the future, there'll be open source APIs that permits for easier integration with modules like our own.

FURTHER SIMPLIFICATION

While we feel our current model is sort of sufficient, there are some improvements that we felt would further simplify our

Design. For instance, eliminating redundant functions and having everything add a smaller amount of sophistication functions

Would be less daunting on the developer side.

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