SMART MIRROR FOR VEHICULAR SYSTEM USING RASPBERRY PI

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***Abstract*- Intelligent mirrors, which continue the works today and will take its place in the future technology, provide both mirror and computer aided information services to its users. Thanks to the micro-controller cards onboard, these systems, which can connect to the internet and take data from the internet, can show this information on the places located on the mirror. In the scope of the study, the developed intelligent mirror system includes the weather information, time and location information, cur- rent event information, user information, and camera image taken from web services using Raspberry Pi 3 micro-controller card. Some equipment can be controlled by voice commands via the microphone on the smart mirror. Internet of Things (IoT) is a concept where an object having the ability to transfer data over a network without the need for human interaction to computer. IoT is known for its advantage that can help simplify people's everyday routine. It shows the information such as time and date, weather, news updates and navigation in it which continue the works today and will take its place in the future technology, pro- vide both mirror and computer aided information services to its users. In the scope of the study, the developed intelligent mirror system includes the weather information, time and location information, weather condition, news feed, and road map for navigation by using Raspberry Pi 3 micro-controller card.**

***Index Terms*- Smart Mirror, Raspberry PI, Weather, Time, News, Date, Google map, Camera.**

I. INTRODUCTION

This concept of IoT has been used here along with two different ecosystems i.e. Android and Adriano. This project is to make a mirror which does the smart things like it shows Weather forecasting, Navigation, Google map, Date and Time, News etc. All these smart features are to be done using raspberry pi. Due to use of smart mirror effectively utilization of time can be achieve. It is a smart and user friendly solution presented in the form of a mirror that also acts as a gateway to interactive services, particularly those of information oriented nature, such as multimedia and news feed among others. Hence, the system allows users access to customizable services, all while they are performing other tasks .As such, it is a convenient time-saver. The proposed smart mirror represents a natural interface that facilitates access to personalized services and control of vehicles to find out the correct path using the Google map and Navigation without using any mobile device. The map and navigation directly shows on mirror in a car or any vehicle. A smart mirror combines the uses of a traditional mirror with a digital aspect to bring up-to-date information to the user directly on the mirror surface. For the most part this information is simple like time, weather, calendar, and news. In the vehicular system the major problem is to find the way to reach at the destination and for that we must have the Google map which shows the correct path to reach at to the destination, but when we use Google map while driving, it causes for accident. That's why we are going to use smart mirror in vehicular system.

1. To design a prototype Smart Mirror using Raspberry PI.
2. To carry out the testing process on Raspberry PI for usability evaluation to users.
3. To design a mirror to show the Road map while driving with guidelines
4. To design a mirror to show the Navigation to reach at destination while driving.

II. RELATED WORK

Proposed system and block diagram for magic mirror are shown in figure 1. The aim of designing this models to create an interactive interface which can be conveniently used in home environment as well as commercial space. Various ser- vices like weather, calendar, traffic, news stock updates etc. can be accessed and controlled using voice commands. The Raspberry Pi 3 is connected to a Monitor via HDM Cable and a webcam is attached using a universal serial bus. Raspberry Pi is powered up using a 5V/2A DC supply.

The proposed smart mirror represents a natural interface that facilitates access to personalized services. This is an attempt to contribute to this of a smart mirror-like interface as well as the smart environment in which the interface is used for interaction in the following, we briefly comment on some related research in this direction. The mirror is eventually a technologically augmented interaction device. The objective of designing the mirror is to provide a natural interface in the ambient home environment for accessing various services such as location based weather, time, calendar etc. We plan to deliver a working prototype i.e. design and development of a futuristic Smart Mirror on Raspberry Pi 3 for the ambient home environment as well as for commercial uses in various industries. Most people have mirrors at home, so the concept of a smart mirror that you can interact with is attractive and can be fantasized by anyone. At times no one has time to read the newspaper or switch on the TV right in the morning to check the news headlines or the weather forecast. The device is to look like a regular mirror but would have a screen inside. The project which would collect real world machine data such as location based latest news and headlines, weather reports, and as well as show us the local time.[2]

The proposed smart mirror system aims to provide users with an interactive interface for simplified and personalized services in the comfort of the users home. It is a smart and user friendly solution presented in the form of a mirror that also acts as a gateway to interactive services, particularly those of information oriented nature, such as multimedia and news feed among others. The proposed design of the smart mirror can be discussed in terms of two perspectives. One is in relation to the mirrors interface while the other is related to the mirrors underlying features by which services are provided. The two-way mirror has a thin reflective coating that allows passage to an amount of light while reflecting the rest. It is partly reflective from one side, and is glass transparent from the other. The reflective side is lighter in shade with a darker transparent side to prevent the reflection of light. This enables users facing the dark side of the mirror to see through, unlike the vision from the reflective (lighter) side of the mirror, through which the users can only see their reflection. We use such a mirror with a television screen for the user-personalized profile display through the connected smart phone with the dedicated mobile application.[5]

III. PROPOSED SYSTEM

The entire system can be subdivided into 3 major sections namely:

1- The Raspberry pi

2- LED Monitor

The Raspberry Pi-

Quad Core 1.2GHz Broadcom BCM2837 64bit CPU 1GB RAM and Bluetooth Low Energy (BLE) on board 40-pin extended GPIO 4 USB 2 ports 4 Pole stereo output and composite video port Full size HDMI (High Definition Multimedia Inter- face) CSI (camera serial interface) camera serial interface display port for connecting a Raspberry Pi touch screen display Micro SD port for loading your operating system and storing data Upgraded switched Micro USB power source up to 2.5A.

LED Monitor-

An LED display is a flat panel display, which uses an array of light-emitting diodes as pixels for a video display.

Their brightness allows them to be used outdoors where they are visible in the sun store signs and billboards, and in recent years they have also become commonly used in destination signs on public transport vehicles, as well as variable-message signs on Highways. The Raspberry Pi 3 is a credit-card sized computer capable of doing just about anything a desktop PC does. The Raspberry Pi's capabilities are extensive. With plenty of graphics processing

power, the Raspberry Pi 3 is capable of streaming Blue ray quality video.

IV. COMPONENTS

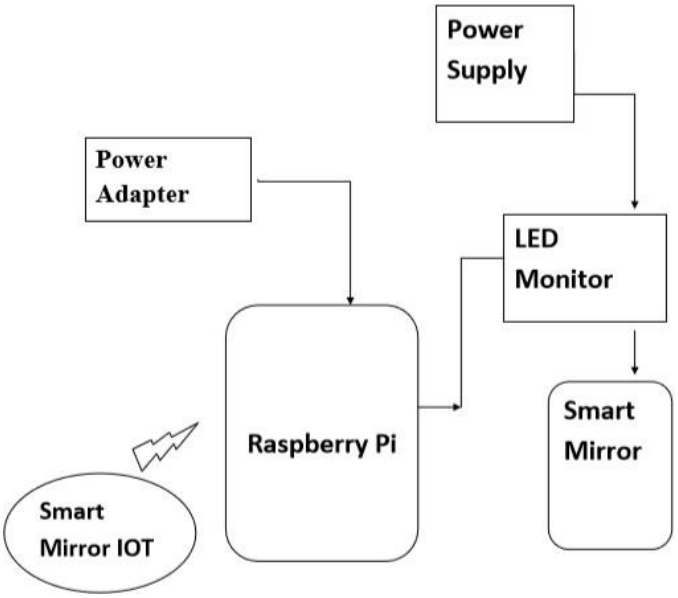
SD Formatter:

SD Formatter is designed specifically for SD/SDHC/SDXC memory cards. The utility differs from operating system format utilities that are meant to format a variety of storage media SD Formatter works with a number of Windows and Mac operating systems. It can be used with the following devices Secure Digital slot on computer Important for SDXC card users: contact your computer manufacturer to confirm the SD slot on your computer is compatible with SDXC cards and for avail- ability of the SDXC driver. USB Secure Digital memory card reader PC Card, Card Bus or Express Card SD adapter.

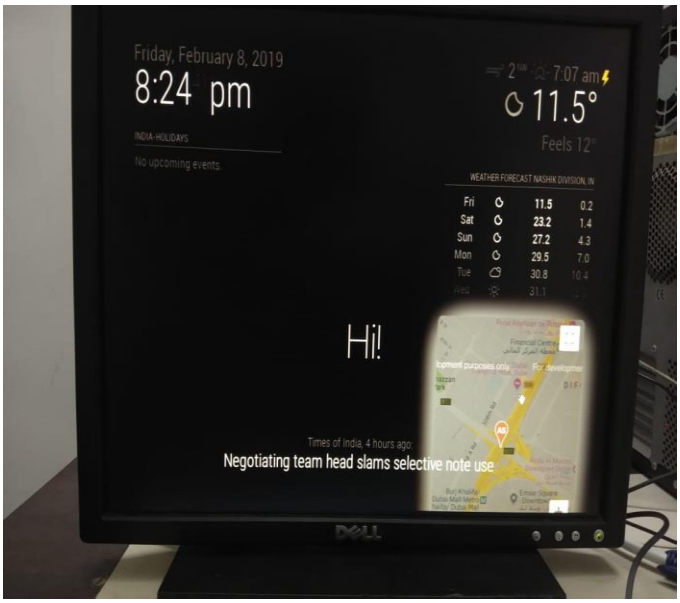
Raspbian:

Raspbian is the main and basic software for RPi devices, officially supported by the Raspberry Pi Foundation. In fact, it is an operating system, based on Debian and optimized for Raspberry Pi hardware. It comes with lots of pre-installed pieces of software appropriate for most of ARM users and developers. And in this blog post, I am going to look through almost all possible operating systems, as well as the Raspberry Pi images, compare and review major types of other software you can use for your complicated Raspberry Pi Projects. But the main operating system, ready- to-use and optimized to the needs of the most developers and makers is Raspbian. So, first thing firstly, lets dig deeper this type of OS for Rpi.

V. ARCHITECTURE



VI. SIMULATION RESULT



VII. CONCLUSION

. As a conclusion, the application is the new technology for smart life. From the result testing, most of the function of the application are functioning well and there still need some improvement to the development of the newest functionality on smart mirror. We have designed an intelligent mirror keeping in mind the up-coming future advancement in the field of vehicular system as well as commercial purpose. The prototype of the magic mirror is powered and controlled by the raspberry pi 3 and all the final output in form of real time data feeds are displayed on led screen fixed with a two way mirror. We have built a working model to demonstrate various functionality of the mirror using voice raspberry pi. It gives a layout that can be extended in future to accommodate even more functionality. Raspberry pi is an innovative technology. The sheer number of users and fan base support the fact that the device can see an abundant future ahead. The device can certainly help anyone who really needs to learn electronics and computers. Raising the processing power can certainly assist the product in the future.

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