Smart Mirror Based on Raspberry Pi

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ABSTRACT: *In mirror we see our reactions but what happens when you combine the importance of mirror with technology? A smart mirror combines the use of traditional mirror with digital aspects to bring up-to-date information to the use directly on the mirror surface. Smart mirror is to contribute an easy way information services to user through verbal commands, functions and listens to the user's question and response them adequately using voice commands. These features of the mirror will be scraped from the Internet and implemented using the raspberry pi board. This paper describes the purpose, construction & operation of the smart mirror.*

I. INTRODUCTION

The purpose of mirror in day to day lives is to observe and interact with ourselves. The interactive mirror is a development effort to augment the mirror with proper fixed information for offering better features that provide personalized data such as date, weather, and regional time corresponding to the location, Google headlines, music and our daily schedule. According to survey, we waste 30 minutes on washing, makeup, and wearing after getting up, and these 30 minutes are also the time for us to observe in the mirror. In order to require full use of this time, in the mirror at same time, can completely access the relative information of the day, this project indicates a kind of Intelligence mirror can be used in the home. The mirror will resolve the problems that many people experience every day, getting information without distraction. Before going to bed, the user may want to know whether it will rain the next morning so that they can plan their exchange.

II. RELATED WORK

Our Smart Mirror shows a natural interface that easy to access to personalized services. The Smart Mirror includes some devices equipped with a raspberry pi. However, most of them support entertainment and some interactive tasks. As the technology and application of digital system is getting popular, the work on this field is increasing. Now days the world is getting more into artificial intelligence. The concept is integrating artificial intelligence into people's life [1]. A smart mirror which is new real world provides interaction between the users. A flat LED display monitor would support the mirror to display the necessary sufficient information that the user will utilized [2]. This author has implemented human gestures & performs advanced functions such as booking a ride on Uber, they also easily extended for some other framework like making phone calls [3]. In order to reach the vision of AI (Artificial Intelligent), it would not only provide local time corresponding to the location but also would collect a real world machine data and the same would be transmitted form the machine and managed by raspberry pi. [4]. It is a special type of mirror application based on face recognition which provides data feed of various website and services [5].

III. PROPOSED SMART MIRROR

We plan to designate and exhibit such kind of futuristic smart mirror which provides a whole modern experience to the user. Our proposed smart mirror consist of a
Raspberry Pi, two-way mirror, acrylic glass, monitor (LED), and motion Sensor. Raspberry Pi 3 B+ is a minicomputer. It uses raspbian operating system. A wooden frame will be prepared with LED attached behind the glass with all the sensors, and the raspberry pi. The power supply is attached to the raspberry pi which will power the LED monitor and the sensors. The block diagram depicts that it would collect personalized data like date, weather of the metropolitan, the latest updates of news and headlines and local time corresponding to the location. For this process internet access will require which will be provided by Wi-Fi module on the raspberry pi.
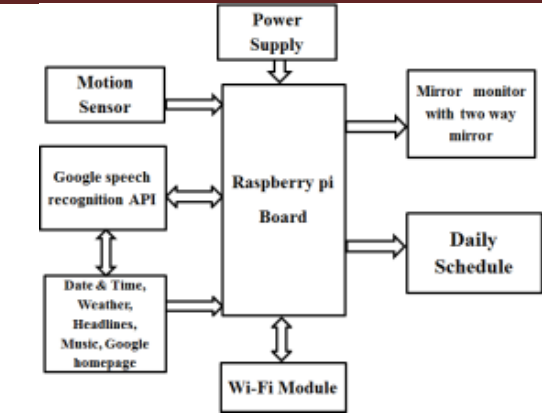
Fig 1.1: Basic block diagram of smart mirror

Once the person appears in front of mirror the motion sensor is activated and mirror will display the welcome message to the user. The audio information will give to the microphone through voice command by user. It can communicate with mirror in real time and search the information on internet. All the information is displayed on the LCD screen connected with the raspberry pi. The mirror will also show the personalized daily schedule of that person and for security purpose we used password for that particular person. The virtual layout that will be prepared using HTML (Hypertext Markup Language) will display on the mirror when it is turned on and will show date, time, weather, and news headlines.
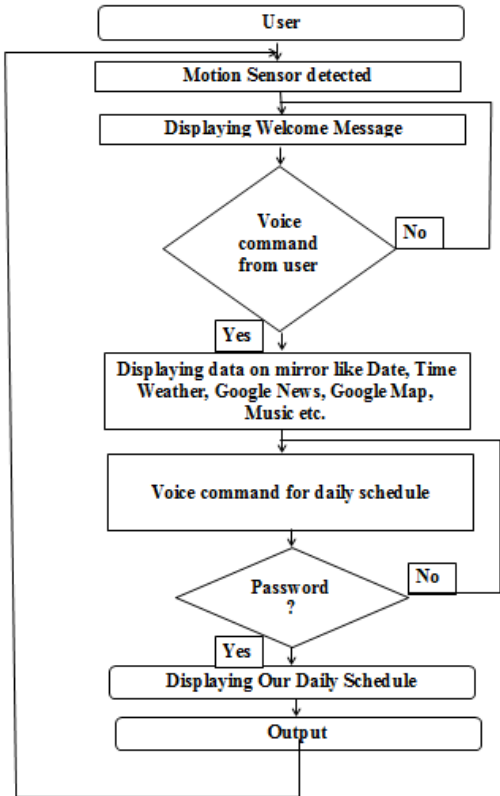

Fig 1.2: Flowchart of smart mirror

The proposed smart mirror will perform these tasks:
1. When the person appears in front of mirror is activated and will show the welcome message to the user.
2. After activating the mirror will display date, time, weather and news headlines.
3. The mirror will also play music and show our daily schedule.
4. Smart mirror can communicate with verbal commands, functions and listen user questions and respond them adequately.
5. The mirror will automatically sleep if a person disappears from mirror with help of sensor.

RESULT
Smart mirror requires 24 hours internet access. When a person gets detected by motion sensor then mirror is turn on in fraction of seconds then we are able to access following data through voice commands:
1. The welcome message is display to the user. According to time it will also show casual greeting like Good Morning, Good Afternoon, Good Evening, Good Night.

Fig 1.3: Welcome window

2. Smart mirror is displaying date and time to the user.

Fig 1.4: Date and Day window

3. Smart mirror is displaying weather.

Fig 1.5: Weather window

4. Smart mirror is displaying latest Google headlines.

Fig 1.6: Google Headlines

CONCLUSION

We have shown interactive mirror that provide date, and regional time corresponding to the location, weather of the metropolitan, the latest updates of news and headlines. The mirror will also play music and show our daily schedule. For security purpose we use password of that particular user for daily schedule. It can communicate with voice commands, functions and listen user questions and respond them adequately. We use PIR sensor instead of Ultrasonic and IR sensor because PIR required direct line of sight between sensor and user in a space. Ultrasonic sensor work using sound waves as a result they can detect people behind obstacles and IR is proximity sensor, it does not work in darker environment.

FUTURE SCOPE

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. We check our heart beats (medical application) [2] through face recognition technology. As per our attire smart mirror will suggest you which makeup is suitable for those particular ladies.

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