

Adroit Speculum for Institutional Updates (Smart Mirror)

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Abstract - The concept of the Computerized Smart Mirror is that it is not like a normal mirror. It is very efficient and interactive in a way that many things can be done at the same time. It is attractive and an irresistible venture. Normally people have mirror at their homes, this could be an efficient replacement to the normal mirror in use. In today's rapid world, people have no time to read the newspaper or switch on the TV right in the morning to check the News headlines or the Weather forecast. The main objective of the project is to gain time and cost efficiency. It displays Time, Weather, News feed and the Institutional updates in your mirror itself. Just imagine a Smart Mirror with all facilities which is interactive and time saving. The Computerized Smart Mirror implemented as a personalized digital device equipped with peripherals such as Raspberry PI, LED display covered with a sheet of reflective one way mirror and provides the most basic common amenities such as weather of the city, the latest update of News in headlines, local time corresponding to the location and even about your Institutional updates.

Keywords: Raspberry PI, One Way Mirror, News, Time, Weather, Institutional Update.

I. INTRODUCTION

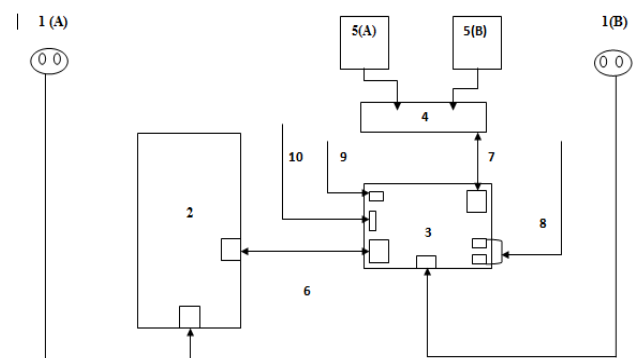
The Computerized Smart Mirror is an effort to make the mirror with proper embedded intelligence for offering enhanced features such as weather of the city, latest updates of news and headlines and local time corresponding to the location. We look at the mirror daily and interact with it psychologically to find out how we look and how our routine is. The project which would collect real world machine data and the data would be transmitted from the machine and would be managed by the Raspberry Pi. The Computerized Interactive Adroit Speculum has brought a new twist to the decade old research and industry initiatives in realizing Smart Environments. The mirror created is capable of displaying the updates of the individual and institution. This mirror has lots of advantage than any other mirrors and can be used with human interaction facility and inbuilt features.

The application of this mirror in the home environment may provide quality, convenience, efficiency, security, and safety to its residents. Besides, the areas of home automation, communication and socialization, rest, refreshment, entertainment, sports, working, and learning at home will be influenced by the innovations of this mirror. Therefore, the

design of smart artefacts for the ambient homes should not be only technology-driven; it should also consider other aspects of home environment with a view to provide comfort and convenience to people living in the environment.

In this paper we make the following contribution. We proposed and developed a functional prototype of the smart mirror using off the-shelf technologies that provide personalized data feeds such as weather, time and institutional updates. Hence, it is highly recommended instead of buying Newspapers, household digital clocks and weather info providing technologies. It can be also installed in manufacturing companies and so on.

II. BLOCK DIAGRAM



- | | |
|----------------------------|----------------------------------|
| 1(A) - Power Cord (20V) | 5(B) - Weather |
| 1(B) - Adaptor (5V, 2.5A) | 6 - HDMI to VGA Converter |
| 2 - LCD Screen | 7 - 10/100 LAN Port |
| 3 - Raspberry Pi 3 Model B | 8 - 4*USB 2 Ports |
| 4 - Internet | 9 - Bluetooth (4.1 802.11n wifi) |
| 5(A) - News | 10 - Memory Card Slot |

Fig - 1: Block Diagram of Smart Mirror

III. COMPONENT DESCRIPTION

1. LCD SCREEN:



Fig - 2: LCD Screen

A **liquid-crystal display (LCD)** is a flat-panel display or electronically modulated optical device that uses the light-modulating properties of liquid crystals. Liquid crystals do not emit light directly, instead using a backlight or reflector to produce images in colour or monochrome. LCD's are available to display arbitrary images (as in a general-purpose computer display) or fixed images with low information content, which can be displayed or hidden, such as present words, digits, and seven-segment displays, as in a digital clock.

2. RASPBERRY PI 3 - MODEL B:



Fig - 3: Raspberry Pi 3 - Model B

The **Raspberry Pi** with a Quad-Core 64bit CPU, Wi-Fi & Bluetooth. The Raspberry Pi 3 Model B is the third generation Raspberry Pi. This powerful credit-card sized single board computer can be used for many applications and supersedes the original Raspberry Pi Model B+ and Raspberry Pi 2 Model B. Additionally it adds wireless LAN & Bluetooth connectivity making it the ideal solution for powerful connected designs.

Technical Specifications

- 1.2GHz Quad-Core ARM Cortex-A53

- 802.11 bgn Wireless LAN and Bluetooth 4.1 (Bluetooth Classic and LE)
- 1 GB RAM
- 64 Bit CPU.

Features

- Now **10x Faster** - Broadcom BCM2387 ARM Cortex-A53 Quad Core Processor powered Single Board Computer running at 1.2GHz.

3. HDMI TO VGA CONVERTER:



Fig - 4: HDMI to VGA Converter

The **HDMI to VGA** is a more difficult conversion to make. HDMI is protected by a system called HDCP. I won't go into specifics on that, but let me say that it is designed to prevent HDMI from being converted to unprotected analog signals. There are a few emerging products that allow you to go from HDMI to VGA. This would allow you to view an HDMI source on a VGA computer monitor.

4. ONE WAY MIRROR:

A **One-Way Mirror** is also called **Two-Way Mirror** (or one-way glass, **half-silvered mirror**, and **semi-transparent mirror**), is a reciprocal mirror that is reflective on one side and transparent at the other. The perception of one-way transmission is achieved when one side of the mirror is brightly lit and the other side is dark. This allows viewing from the side that is lightened but not by the darkened side.



Fig - 5: One Way Mirror

IV. RELATED WORK

The proposed Computerized Interactive Adroit mirror represents a natural interface that facilitates access to personalized services like news feeds, date, time, weather, opening the mail id making the user very convenient with the house environment. There are many other related works done before and the related works has been discussed in detail.



Fig – 6: Output of the Related Work

The Magic Mirror is a work similar to that of the Computerized Interactive Adroit Mirror. But it has limited features only. In that mirror a one-way mirror is used in front of the LED monitor thereby working as a regular mirror. In addition to that the users will be able to obtain minute updates of latest news and public headlines, weather reports. The features of this mirror is very limited and compact. The recent work includes a mirror which provides an ambient environment to the inmates of the house by accessing to the Facebook and also displaying the time, date and weather reports.

V. PROPOSED WORK

The Computerized Interactive Adroit Speculum is designed to perform several functionalities, it will mimic a natural mirror interface through a flat LED Screen used for the mirror display. A one-way mirror is used in front of the LED Screen thereby working as a regular mirror. In addition to that the users will be able to obtain updates of latest news headlines, weather reports as well as get Institutional Updates.

VI. METHODOLOGY

1. Installation
2. API (Python Script)
3. Open CV
4. Display in Adroit Speculum

Our work includes the design and development of a Mirror on Raspberry Pi for best home environment. Most people have mirrors at home, so the concept of this mirror is that you can interact with it. At times many don't have time to

read the newspaper or switch on the TV right in the morning to check the news headlines or the weather forecast. If a mirror serves to these purposes, one can imagine the amount of time it will save and be of such a great use.

This product resembles like a normal mirror but have a LCD screen inside. OS is installed in raspberry pi. Then our own Python script is complied. This program consist modules namely Image lib, Opencv2 and time. The weather API (Application Program Interface) is used to get the accurate weather of the city. This API provides the weather for the certain areas. This displayed on the Mirror. This weather API include Time and calendar also. The news section is completely depend on the Google RSS feeds.

VII. RESULTS & CONCLUSION

This product will be cost efficient and time saving. It includes two major parts displaying features such as weather of the city, latest updates of news and headlines and also local time corresponding to the location and Institutional Updates is displayed in the mirror. Designed a futuristic smart mirror that provides natural interaction between users and the ambient home services. The mirror displays the necessary information that are useful for the user.



Fig – 7: Output – Weather, Institution Logo, Time & Date and Institutional Updates in Smart Mirror



Fig – 8: Output – Google News in Smart Mirror

The future work includes comparison of facial features on present day and previous day, making calls and voice command. It can also serve in displaying services such as Calendar, Map. Facial Recognition can also be employed for security purposes.



Fig - 9: Final Output of Smart Mirror

VIII. REFERENCES

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