

## Smart Mirror

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**Abstract:** There is no end of objects that could be made “smarter,” some being more suited to this than others. Mirrors, for example, provide a large surface ideal for displaying information and interacting with. This paper depicts the design and development of a smart mirror that represents an elegant interface for glancing information for multiple people in a home environment. A smart mirror is basically a mirror with a screen behind it. That screen can be an Android tablet or a computer monitor. Naturally, a monitor will make for a larger mirror. It's also a great way to repurpose an old LCD monitor. The mirror will possess the ability to display date, time, the current weather conditions and outside temperature, reminders, to-do lists. 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 which is part of Linux. The mirror will also be lightweight, adjustable, durable and aesthetic.

**Keywords:** *Raspbian Operating System, Two way mirror,*

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### Introduction

This project has been developed within the context of a time where every day we see more and more connected devices. The Internet transformed our lives by connecting us more easily to information and other people in the virtual world. Mobile phones then became smartphones and since then this concept has erupted and morphed into the Internet of Things, things which connect us to everyday objects. There are no end of objects that could be made “smarter”, some being more suited to this than others. Mirrors, for example, provide a large surface ideal for displaying information .

The purpose of this project was to design and build what is commonly called a Smart Mirror, or a household mirror with an integrated digital display. The guiding principle of this endeavor was to produce a product that is simple to use, attractive to look at, and that incorporates several visual applications to make daily life more efficient. We look at the mirror daily and interact with it psychologically to find out how we look and how our attire .The smart mirror is a development effort to augment 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.

### Previous Methods:

In order to understand how smart mirrors work, we must first learn how a normal mirror functions.

#### Normal Mirror:

A traditional mirror is manufactured using a procedure known as 'silvering'. A coat of some kind of highly reflective metallic material is applied to one side of a glass. A layer of copper is added on top to prevent the oxidation of metal. The entire assembly is then sealed with a coat of paint. This protects the inner reflective layers and also prevents any light from passing through to the other side of the glass.

Simply put, a normal mirror consists of nothing but a piece of glass that is fixed on to some kind of metal, silver, nickel or tin. When light passes through the glass it gets reflected back and hence the image gets 'mirrored' in it.

### Proposed Method:

As technology increases we experience our environment to become smarter by the week. We are familiar with not only smart phones, but also smart bikes, fully connected cars and of course smart hotels. Likewise this is the idea of “smart mirror”. Smart mirror is an emerging concept in this fast changing IT world. Smart mirrors are used in both automotive & non automotive sectors.

**What is Smart Mirror:** A smart mirror is basically a mirror with a screen behind it. That screen can be an Android tablet or a computer monitor. Naturally, a monitor will make for a larger mirror. It's also a great way to repurpose an old LCD monitor.

### Block Diagram:

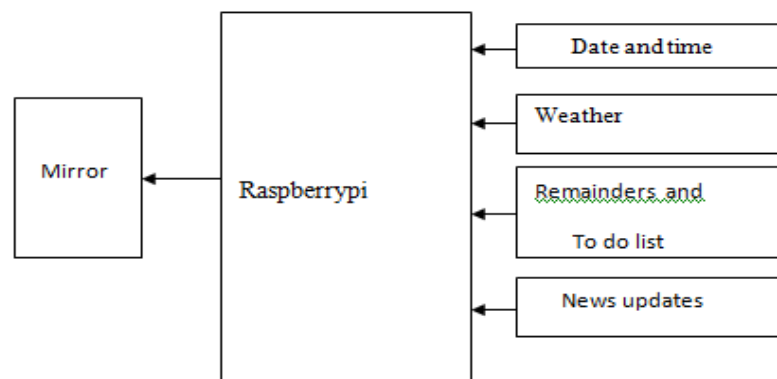
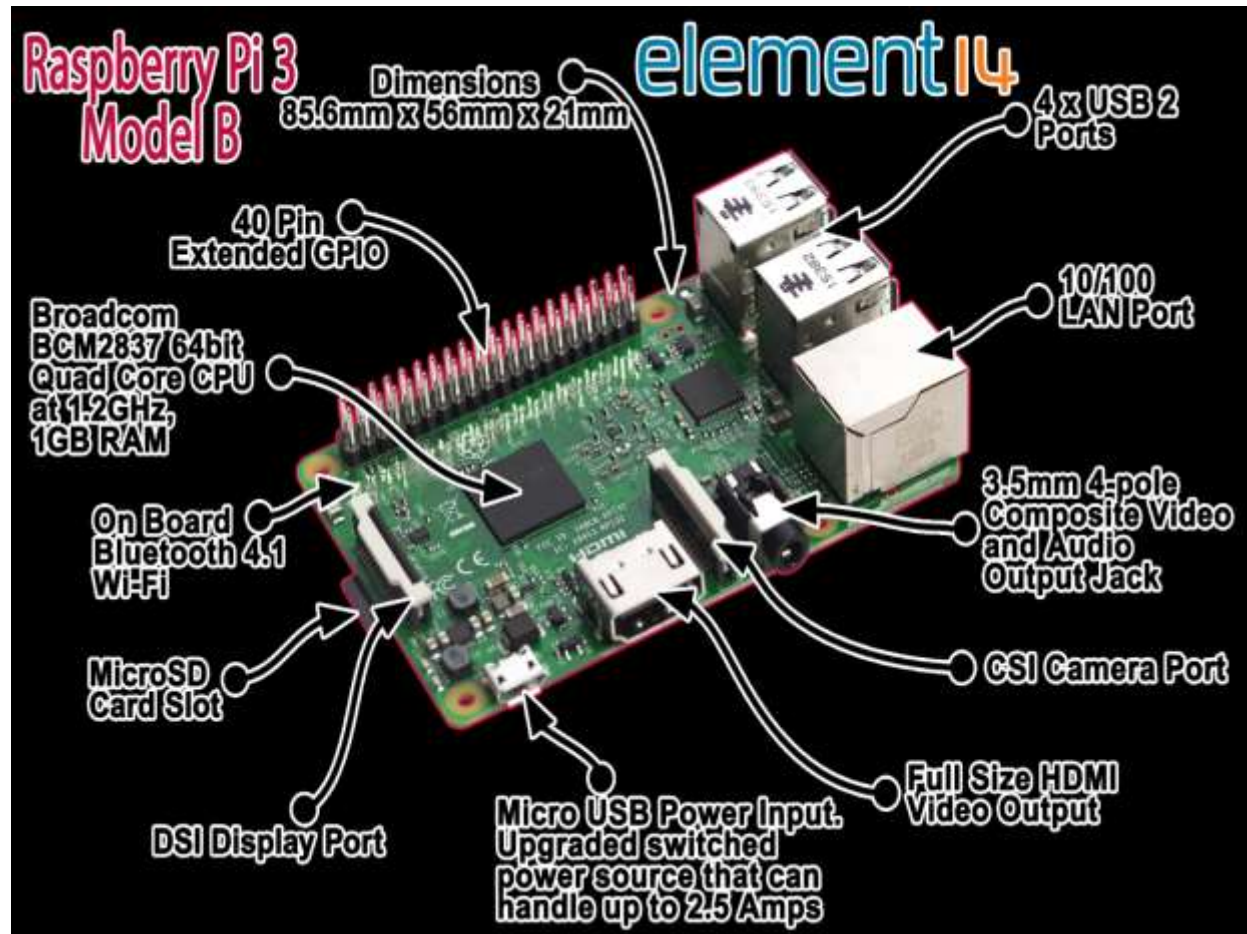


Fig: 3.1.1 Block diagram

### Block diagram Explanation :

- Block diagram consists of an IR Sensor, Mirror Panel and Raspberry Pi board connected to each other.
- An IR Sensor is used to detect the appearance of a person and it sends the information about the person appearance.
- So that the kit gathers the required information about date, time, temperature, reminders, News headlines and Gmail Updates.
- All these details are scrapped from the internet using Python programming Language.
- The raspberry Pi board is operated by Raspbian Operating System, which is a part of Linux.

Circuit Diagram:



Here are the various components on the Raspberry Pi board:

ARM CPU/GPU -- This is a Broadcom BCM2835 System on a Chip (SoC) that's made up of an ARM central processing unit (CPU) and a Videocore 4 graphics processing unit (GPU). The CPU handles all the computations that make a computer work (taking input, doing calculations and producing output), and the GPU handles graphics output.

GPIO -- These are exposed general-purpose input/output connection points that will allow the real hardware hobbyists the opportunity to tinker.

RCA -- An RCA jack allows connection of analog TVs and other similar output devices.

Audio out -- This is a standard 3.55-millimeter jack for connection of audio output devices such as headphones or speakers. There is no audio in.

LEDs -- Light-emitting diodes, for all of your indicator light needs.

USB -- This is a common connection port for peripheral devices of all types (including your mouse and keyboard). Model A has one, and Model B has two. You can use a USB hub to expand the number of ports or plug your mouse into your keyboard if it has its own USB port.

HDMI -- This connector allows you to hook up a high-definition television or other compatible device using an HDMI cable.

Power -- This is a 5v Micro USB power connector into which you can plug your compatible power supply.

SD cardslot -- This is a full-sized SD card slot. An SD card with an operating system (OS) installed is required for booting the device. They are available for purchase from the manufacturers, but you can also download an OS and save it to the card yourself if you have a Linux machine and the wherewithal.

Ethernet -- This connector allows for wired network access and is only available on the Model B.

### Results

In this study, we used a Wooden frame mirror of size  $252 \times 252$  and the monitor of size \*\*\*\*\*. In the experiment date, time, weather and news headlines are displayed on the mirror as;



## Conclusion

This documentation was about the smart mirror project. This stemmed from the need for better time management and productively along with the inspiration of new, developing technologies now available. The smart mirror idea was created to give instant access to information in a convenient and time-saving environment, the bathroom. All other aspects of the mirror's design developed from these ideas and inspirations. The goals of the smart mirror were to aim to reduce time needed in a user's daily routine and provide a merger of user and technology that becomes an enhancement, not a new burden. The functionality must meet these descriptions in the design. The smart mirror did the thinking for the user with intelligent, commonly used applications. Apps like their calendar, news, to-do lists, and weather will be available. The apps were unobtrusively displayed on the screen, hidden by the two-way mirror, as to look like a seamless experience. The user didn't even have to worry about turning on and off the system because the mirror will detect motion and do the work for them.

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