



# DESIGN AND IMPLEMENTATION OF IOT BASED SMART MIRROR USING RASPBERRY PI

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**Abstract** - This project depicts the design and development of smart mirror that represents an elegant interface for glancing information and also used for strange person detection in a home. A smart mirror is a system that functions as mirror with another capability of displaying date, time, current temperature, rain fall details. To design a smart mirror that receives a online news and display it using Internet of things (IoT) circuitry and to detect any unknown person when no one present in the house.

In this world everyone needs a comfort life. ultramodern man has constructed different technology for his purpose. In this world, people need to be connected and they're willing to get the information fluently. Whether it's through the TV or internet, people need to be informed and in touch with the current affairs passing around the world. The Internet of effects means connection via the internet of computing devices in everyday objects, enabling them to shoot and admit data.

**Key Words:** IoT, DHT22, Pi-camera, PIR, Raspberry-Pi

## 1. INTRODUCTION

The Internet of things (IoT) is changing every corner of life, the home, the office, city thoroughfares and beyond. In this design, we are worked to make an IoT device called smart mirror which is a one-way mirror.

This project allows software to present applicable information while you get ready for the day. A smart mirror is a system that functions as mirror with another capability of displaying date, time, current temperature, rainfall details. It can also detect the face using pi-camera. It's a wall mounted glass which displays applicable particulars that similar as rainfall, time, date, temperature, moisture and news and other fields of interest.

IoT come up with the idea of ever covering objects through the Internet. When it comes to our home, security is vital issue to the general public. For enhancing the security of home this frame is used by proprietor of the house.

Intelligent mirrors, which continue the work and will take its place in the new technology, give both mirror and computer backed information services.

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 extent of the study, the developed intelligent mirror system includes the rainfall information, time and date, event information, user details, and camera image taken from web services using Raspberry Pi 3 micro-controller card.

A speaker is there for sound greetings for known persons. Internet of things (IoT) is a conception where an object having the capability to transfer data over a network without the help of a person interaction to computer.

## 2. LITERATURE SURVEY

In 2017 a company called New Kinpo Group launched their take on the smart mirror called Hi-Mirror. This smart mirror has a camera to specifically monitor your skin health. The mirror will scan your skin and give you metric to tell you what to improve. The mirror uses facial recognition to log a user's skin firmness, texture, clarity, brightness and health on a day-to-day basis.

Griffin Technologies unveiled their take at the smart mirror at the 2017 CES convention. They call their product the Connected Mirror and it will serve as the smart home hub for several smart home appliances made by Griffin Technologies. The mirror can display local time and weather, notifications from your phone and statuses from other Griffin smart home tech connected to the mirror. The mirror does not employ any user recognition, but the interface can be customized through a smart phone app that is also used to control any other Griffin smart home devices

Belma RAMIC-BRKIC - Jan,2018

They have observed the purpose of the displayed information on the mirror is to save the time spent in the mornings in search for such information.

Lakshmi N M – 2018

They have observed smart mirror saves time and makes it easier to access information and we have integrated a thief detection system into our smart mirror.

Nathasia Florentina Thejowahyono - 20 Aug,2020

They have observed This smart mirror will be given an intriguing element that shows the date, time, weather, traffic data, notice, reminder, schedule, News source, and everyday update.

Mochammad Haldi Widiyanto - Sep,2020

They have observed the next smart mirror test has also been successfully accessed and it can be used to improve learning.

In 2003 Phillip unveiled their Mirror TV that was built using the same principles that of smart mirrors. Their product was a normal TV that was put behind a two way

scan your skin and give you metric to tell you what to improve. The mirror uses facial recognition to log a user's skin firmness, texture, clarity, brightness and health on a day-to-day basis.

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Smart Mirror for Smart Life. 978-1-5090-6255-3/17/\$31.00 2017 IEEE

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### 3. METHODOLOGY

#### 3.1 Mirror

We can see wanted information as we can see it in a mirror while looking with the help of one-way mirror.

#### 3.2 Information System

Time, Date, rainfall details and news are brought from online using predefined URL. News is brought from websites. DHT22 is connected to GPIO pins of Raspberry Pi board using wires. DHT22 digital detector is used to get the moisture and temperature details.

#### 3.3 Security System

When there's no one in home camera and PIR detector will work to detect presence of any others in home. When someone enters into room, PIR detector will detect the movement of the person when he passes by the mirror and capture the image and stores it. And it sends the image to the registered Telegram Bot that's in the mobile, so this can be used as a security system.

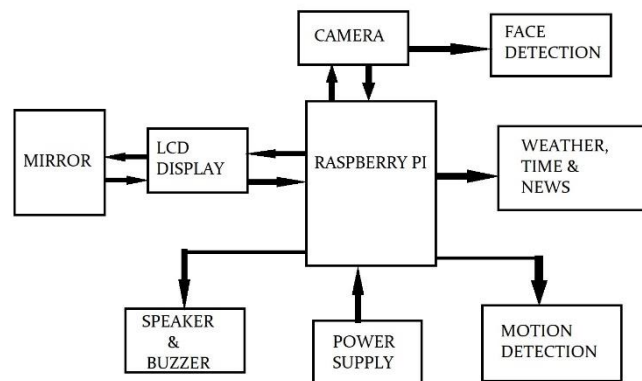


Fig -1: Block Diagram for Smart Mirror

### 3.4 Algorithm for Information System

- Step 1: Switch on the power supply.
- Step 2: Get the date, time and rainfall details from predefined from internet.
- Step 3: Get the news from internet.
- Step 4: All the greetings to be displayed on mirror is written in code section.
- Step 5: Display it on the mirror that's over the LED monitor.
- Step 6: Switch to the Face detecting mode.
- Step 7: Switch off the power supply when it is not in use.

### 3.5 Algorithm for Face Detection

- Step 1: Start
- Step 2: Setup the Camera
- Step 3: Check the PIR sensor for output.
- Step 4: If it's low, go to step 3.
- Step 5: If it's high, camera is turned ON.
- Step 6: Image is taken and stored on raspberry pi.
- Step 7: Check whether Wi-Fi connection is connected or not.
- Step 8: If it's connected, image is transferred to Telegram bot.
- Step 9: Notification is updated in the mobile.

### 4. RESULTS

A cutting-edge smart mirror system that assists in thief detection while providing information such as time, date, correct temperature and humidity, and the most recent news while dressing and grooming in front of the mirror.

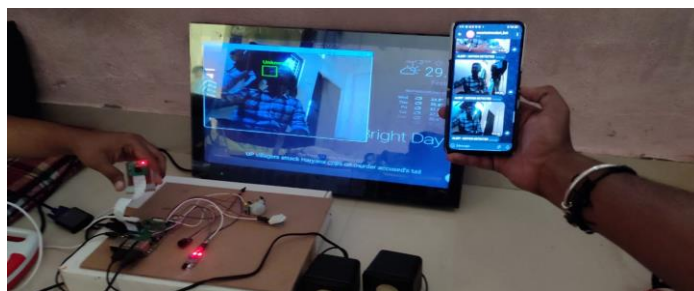


Fig -2: Information system

## 5. CONCLUSIONS

The goal of the project was to create a mirror that could show a changing time and date. We consider the display to have met our minimal success criterion, and we are happy with the result.

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