PERSONALIZED SMART MIRROR WITH VOICE CONTROLLED HOME AUTOMATION USING RASPBERRY PI 3

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ABSTRACT

This paper presents a design of interactive voice controlled Smart Mirror.The mirror is converted into personalized digital device equipped with peripherals such as Raspberry PI-3, Google Assistant, and LED Monitor that is covered with two way mirror that provides the most basic common amenities such as weather, latest news and local time. With the help of speech processing techniques we can also control the equipments or devices of the home such as light, fan, blub . The Smart Mirror interacts with help of verbal commands to people. It responds to user's questions.

Keywords—Raspberry Pi-3 , Google Assistant , Smart Mirror

1. INTRODUCTION

The Internet has transformed our lives. Mobile phones are now smart phones and this introduced the concept of Internet of Things (IOT). Our research is to design a device called as "Smart Mirror". This project is been developed within the time where every day we get to see birth of new technology.

The motive of this project is to help humans with time management which has become an important aspect of life. So smart mirror is an effective step. As we know that sole purpose of a mirror is for personal grooming/admiring oneself, or used as a decoration piece So we are going to design a prototype which combines both the traditional mirror and time spent on smartphones together by embedding various electronic features to the mirror. Heads will be up, hands will be set free.

Rest of the paper is organized as: In Section II, some related work is presented. Section III presents the proposed work. Section IV discusses the problem definition . Section V algorithm. Section VI concludes paper with future work. Section VII gives the references.

2. RELATED WORK

Multi Display in Black Mirror [1] by Toshiba is a prototype which combines the functions of tablet together with reflecting surface of mirror. Taking into account two different home environments it provides different configuration: washroom and kitchen. Consider the washroom whose prototype provides

information useful for the beginning of day such as the weather forecast and fitness information from personal devices whereas in kitchen, while preparing recipes it allows the user to interact through gestures for appliance control as it has a camera..

"Smart Mirror: A Reflective Interface to Maximize Productivity"[2] Piyush Maheshwari ,Maninder Jeet Kaur, Sarthak Anand designed a prototype which describes a voice controlled wall mount mirror capable of displaying multimedia contents and also facial recognition. It uses OpenCV (Open Source Computer Vision Library) as an open source computer vision and machine learning software library.

"DESIGN AND DEVELOPMENT OF A SMART MIRROR USING RASPBERRY PI"[3] by Vaibhav Khanna,Yash Vardhan, Dhruv Nair, Preeti Panu designed an interactive multimedia futuristic mirror that used artificial intelligence for home environment and also for commercial use in factories. There smart mirror is able to display weather, latest news and time.

"IMPLEMENTATION OF MAGIC MIRROR USING RASPBERRY PI 3"[4] by SuryanshChandel, AshayMandwarya, S.Ushasukhanya designed and implemented a voice controlled wall mirror, called "Magic Mirror". It is a device that can function both as a mirror and an interactive display displaying multimedia content as time, date, weather and news simultaneously.
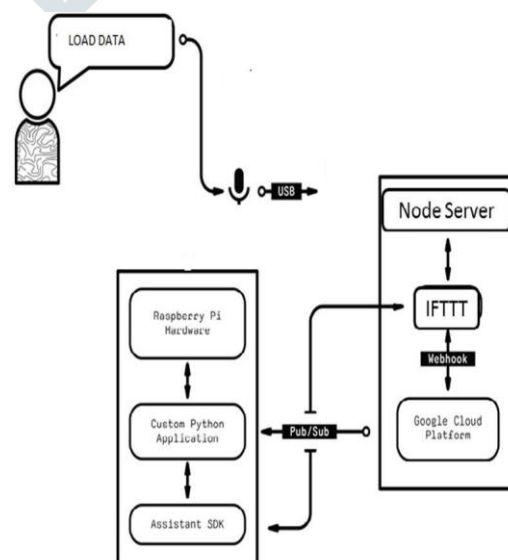
3.PROPOSED WORK

Fig.1-Block diagram.
In smart mirror the LCD screen is connected to

the raspberry pi. And the screen is placed behind single sided mirror so the screen is off at that movement the screen appears as mirror and when we start the mirror it will show data on mirror. The controller will also connect with the voice input i.e google assistant. When we command to google assistant then according to command the data will fetch by controller from server and display on screen. In our project we are going to display the current time date and surrounding temperature and news.
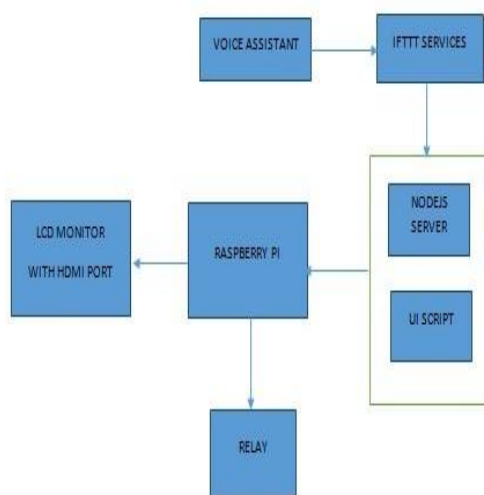

Fig.2- Block flow of proposed model.

4. PROBLEM DEFINITION

Along with counsel, people greatly value their appearance, spending immense amount of time in front of the mirror during their morning and night routines. This is a significant amount of time spent where important things are taking place, but the mind is not working. As our lives are increasingly spent staring at phones, laptops and televisions. It can also cause cataracts, headaches, eye strain and discomfort. Digital eye strain, sometimes referred to as computer vision syndrome, is well documented. If you've ever experienced dry or irritable eyes, blurred vision, eye fatigue, or head, neck and back pain after using a computer or Smartphone, then you're familiar with it.

A compact product is required that can allow a person to efficiently complete everything they need to do to prepare for the day ahead with simply the voice control that does not strain the eyes and also switches off or on the home automated appliances like light, fan, blub etc.

5.ALGORITHM

STEP 1: Start the power supply of raspberry and monitor.

STEP 2: Configure Monitor and relay with raspberry pi.

STEP 3: Load Bash script for auto run files.

STEP 4: Load the Web service in Kiosk mode on start up.

STEP 5: Load The web service in KIOSK mode.

STEP 6: The web service will load data on screen on request of voice assistant.

STEP 7: Voice command from the assistant generated it will invoke web service in backend for particular command using web hook by IFTTT.

STEP 8: That service will set the status variable for particular field like temperature, news;

STEP 9: The status will be read by JavaScript and call corresponding API for data.

STEP 10: Response receive from API will be loaded on front end div of web service.

STEP 11: Load Python script for relay operation in start-up.

STEP 12: Similarly for voice command python script will read the response.

STEP 13: The data received on python will be process to change state of relay.

STEP 14: Using the state of relay NC NO we can control appliance.

6. CONCLUSION AND FUTURE SCOPE

The paper proposes a smart mirror system which allows users to utilize a object as an interactive interface to provide customizable services. The tracking of health is an added advantage in leading a healthier life. With the functionality of controlling the light settings it can be applied in various fields such as beauty palours and hotels. Further for security purposes face recognition technique and personalized voice recognition can be used .This makes sure that only authenticated users can access the information on the mirror.

We have designed a futuristic smart mirror that provides interaction between users and internet. A flat LED display monitor act as mirror display cascaded by a 2-way mirror that displays all important information useful for the user. A picture-in-picture sub-display is provided by the mirror with voice control to facilitate the display of services such as maps, videos via YouTube. It will also help to control home services like switching off and on of lights, fan speed control, controlling temperature of AC etc.

7. REFERENCES

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