

Smart Mirror using Raspberry Pi

Sruthi Gollapalli, Konatham JayaSree, Banavathu Kalyani, V.V.N.V.Phani Kumar



Abstract: As the world is running at a faster pace, an individual finds it difficult to take time to get to know the vital information like news updates, weather forecasting, reminders in order to plan the day accordingly along with getting ready in the morning. Instead of allotting separate time for the morning updates, an individual can view the updates of required while getting ready in the morning, which saves time. A Smart Mirror is used to display news, time, weather updates and it is based on Raspberry Pi 3B+ and part of home automation. In this we are displaying the content required by the user on monitor and a two way mirror attached to it, which is enclosed in a wooden frame. As part as now, people are usually preferring 'Multi-tasking' as it became the usual habit for most of the people. The Smart Mirror aims to display the information to the user like time, date, weather calendar, reminders and news-updates.

Keywords: RaspberryPi-3B+, Multi-tasking, News, Reminders News-updates, Calendar, Weather-updates.

I. INTRODUCTION

Everything in the world is tending towards a greater development and everything is connected. Day by Day, everything in the world is being connected to one another. More number of devices are being connected to the Internet. Individuals are tending towards smart devices rather than conventional things. Everything is getting into "Smart". Usually Mirrors are used for grooming purposes in a man's daily life. In this fast pace of life, man is moving towards "Smart" devices. Internet plays a vital role for getting connected and it plays a key role for being Smart. Smart Mirror is a device which displays various information like news, weather updates, reminders, time and date. Man in his hectic life finds it difficult to find time to read news-paper or to get some important updates. An individual while getting ready in the morning, he can check out the weather forecasting and can plan his day accordingly. He/ She can also check out the reminders and complete their tasks. "Multi-tasking" has become a part of an individual's life and these mirrors are very useful. A Smart Mirror is a device which displays various information to the user while working as a "conventional" mirror.

II. RELATED WORK

Sun Yong, et. al., [1] they have presented the Smart Mirror as a combination of a controller, a display module, a wireless transceiver module, a clock module and auxiliary function module. The user can interact with the speech module such as interacting with the mirror by asking the details like weather updates, news updates, time, the mirror can automatically obtain the related information through broadcast and Network. N. Niroshima Raj, et. al., [2], they have bridged the Raspberry Pi to the mirror that can be accessed by the students of the university for perceiving course registration and queries are stored in the database which can be only retrieved by the admin, the controller. Ayushman Johri et. al., [3], they have coated Smart Mirror as a thin fine sheet, that bridges as a pensive mirror to the user, allowing the monitor at the back to display content by the thin pensive sheet. Raspberry Pi module is connected to the monitor through an HDMI cable and it is connected with Arduino Ultrasonic sensor which supports the outputs via the monitor. Kun Jin, et. al., [4] they provided the occupants with a series of intelligent experiences such as home appliance control, Information acquisition, Environmental monitoring, entertainment and remote operation. Oihane Gomez-Carmona, et. al., [5] they have presented the design, implementation of an interactive system called SmiWork. It is devised to motivate physical habits in the workspace. Both qualitative data and quantitative data were gathered during the process to test the suitability of the approach towards using RFID as a mean to recognize users provided an interaction method for accessing to personal information.

III. PROPOSED WORK

Smart Mirror is the latest advancement, where a mirror becomes interactive by providing the user with required information displaying on the mirror. An individual in his/her daily life finds it difficult to find time for news-updates or any other information. Hence Smart Mirror makes it way for making a conventional mirror to work "Smart".

Architecture:

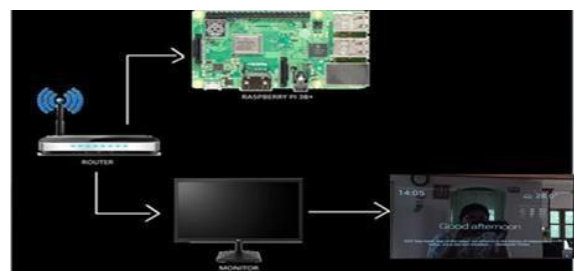


Figure 1. Smart Mirror Architecture

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Figure 2. A two-way Mirror



Figure3. Wooden case attached to the two-way mirror

Figure 1 depicts the architecture of Smart Mirror, where a two-way mirror, LED monitor, Raspberry Pi 3B+ is used. Raspberry-Pi 3B+ has built in wi-fi access such that the information which is displayed on the monitor is accessed via Wi-Fi. A two-way mirror with wooden frame is attached to the LED monitor, such that the information displayed on the mirror is appeared on the mirror.

Methodology:

The Smart mirror is a device which displays the information required by the user as well works as conventional mirror. We have used an LED screen as an interface between the user and mirror. The monitor is connected to the Raspberry Pi-3B+, then the required information by the user is retrieved through Wi-fi access. The information which is to be displayed is pre-requisitely set by the user.

The LED screen is used to display the required information for the user. In this, time and date, weather-updates, calendar, reminders and news-updates are displayed on the mirror.

- Time and Date: Time and Date are displayed on the mirror.
- News-Updates: News updates are retrieved from Google News and displayed on the mirror.
- Weather Updates: Weather information is taken from OpenWeatherMap. The current weather and forecasting is displayed on the mirror.
- Reminders: The reminders are retrieved from Google Calendar and are displayed on the mirror.
- Calendar: A monthly calendar view is displayed

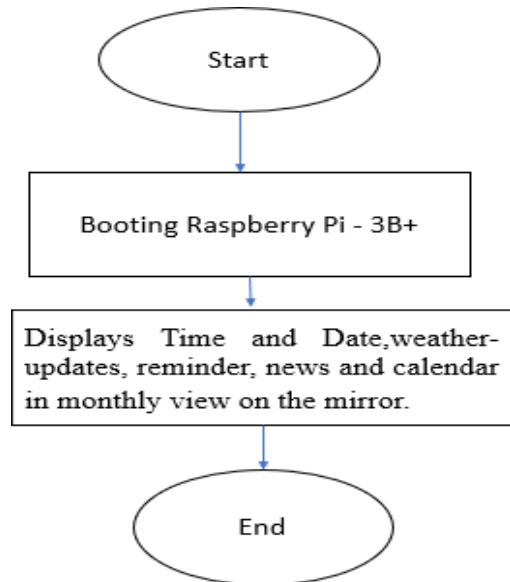


Figure 4. Flow Chart Representation of Smart Mirror

Figure 4 depicts the flow chart representation of the Smart Mirror. When the mirror is switched on, then the booting of Raspberry-Pi 3B+ takes place. Once the Raspberry-Pi starts, then the required information is displayed on the mirror and updated timely.

IV. RESULTS

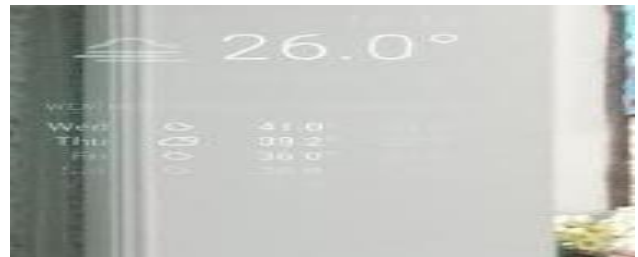


Figure 5. Current Weather and Weather forecasting is displayed on the mirror.



Figure 6. Time and Date, Calendar in a monthly view is displayed on the mirror.



Figure 7. News from Google News is displayed on the mirror.

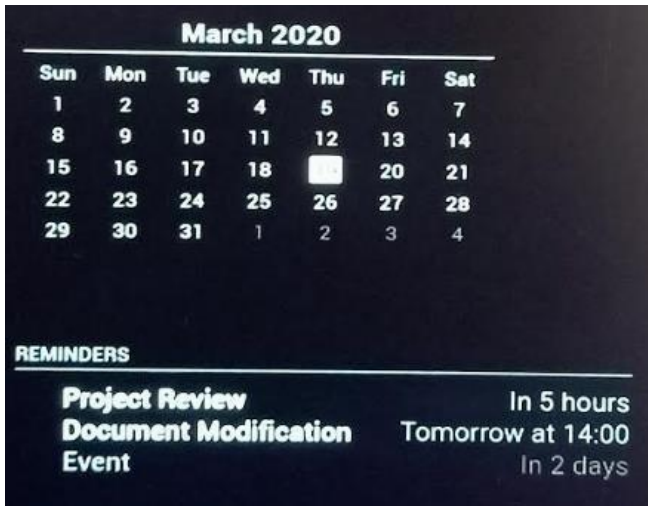


Figure 8. Reminders retrieved from Google Calendar is displayed along with time.

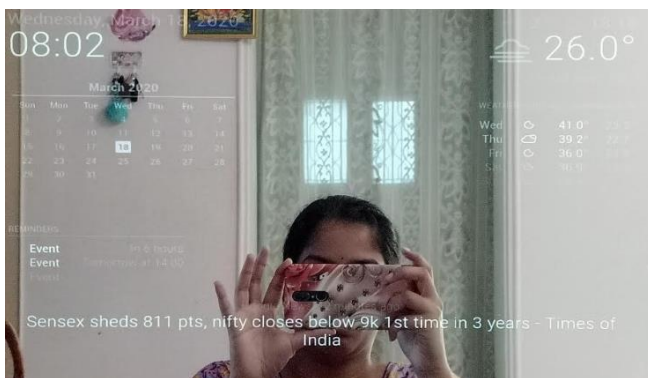


Figure 9. Smart Mirror

The Mirror displaying the required information, working as "Smart" as well as "conventional" mirror too.

II. CONCLUSION AND FUTURE SCOPE

The main aim of the Smart Mirror is to provide a mirror the functionality of being smart while acting as conventional mirror. An individual while getting ready can have the important updates in order to plan accordingly. Instead of allotting separate time schedule for the daily feeds like news, reminders, he/she can view the updates instead of time consumption. We have displayed time and date, current weather and weather forecasting, news, reminders and calendar. The conventional mirror became an interactive mirror by providing the required information. Further, we can add other real time application like Google Maps.

REFERENCES

1. Sun Yong,Geng Liqing*,Dan Ke,"Design of Smart Mirror Based On Raspberry-Pi",International Conference on Intelligent Transportation ,Big Data &Smart City,2018.
2. R.Akshaya,N.NiroshimaRaj.S.Gowri,"Smart Mirror-Digital Magazine for University implemented Using Raspberry Pi",International Conference on Emerging Trends and Innovation in Engineering and Technological Research,2018.
3. Ayushman Johri,Raghav Narain Wahi,Sana Jafri,Dr.Dhiraj Pandey,"Smart Mirror: A time saving and Affordable Assistant",International Conference on Computing Communication and Automation,2018.
4. Kun Jin,Xibo Deng,Zhi Huang,Shaochang Chen," Design Design of Smart Mirror based on Raspberry Pi",Advanced Information Manangement, Communicates ,Electronic and Automation Control Conference,2018.

5. Oihane Gomez-Carmona,Deigo Casado-Mansilla,"Smi-Work An interactive Smart Mirror Platform for WorkHealth Place Promotion".IEEE 2nd International Multidisciplinary Conference on Computer and Energy Science,2017.

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