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Implementation Of Magic Mirror Technology In Libraries

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Abstract: This system is a move towards creating a smart library. We are entering a new age of computing known as magic mirror technology. The magic mirror offers the possibility of providing solutions that enhance the efficiency and security of library services. This paper outlines various potential applications along with their benefits and drawbacks. In light of this, we suggest a method to enhance library services and create a more user-friendly system for patrons.

Index Terms **- Magic mirror, Internet of Things (IoT), Wireless System**

I.INTRODUCTION

A smart or virtual mirror is a two-way mirror with a digital screen located behind the glass. Smart mirror functions both as a mirror for reflection and as a display for information. In the modern era, staying connected is essential for individuals, who are keen to easily access information. Through various platforms like television and the internet, people seek to remain updated and involved with global events. The Internet of Things (IoT) describes the linkage of computing devices embedded within ordinary objects via the internet, allowing for the transmission and reception of data. Our way of life has changed to prioritize time optimization above all else. Our work revolves around the premise that everyone checks their appearance before heading out, which leads to the question: why not make mirrors smart? This device not only acts as a reflective surface but also has the ability to display multimedia information, including the time, date, news, text, images, and videos. It allows users to access and engage with relevant information, like weather updates, seamlessly as part of their everyday routine. A smart mirror represents a groundbreaking device that merges the traditional mirror's functionality with the capacity to present valuable information. Smart mirrors leverage the Internet of Things (IoT) concept, allowing them to communicate with other connected devices and the internet to deliver real-time updates. The incorporation of technology into our daily lives improves convenience, efficiency, and connectivity. As smart mirrors gain wider availability, they are poised to transform the way we interact with information in our everyday settings.

II. OBJECTIVES

i. The primary objective of these techniques is to save users time and provide immediate information.

ii. ii. A smart mirror that provides specific information through wireless connections displays information to assist users in locating materials in their collection by navigating

catalogue systems, identifying call numbers, highlighting new arrivals, and directing them to the appropriate shelves.

iii. It aids users in exploring electronic databases and searching for scholarly articles, e-books, and other digital resources. Users can operate it remotely through any smart phone or tablet.

iv. This study aims to eliminate the cumbersome task of manually posting notices on traditional boards and streamline the concept of traditional notice boards to avoid the challenges associated with their maintenance.

v. It reduces the amount of paper wasted on conventional notice boards and enables hands-free sharing of notices using magic mirror technology.

III. TYPES OF THE MAGIC MIRRORS

i. We have categorized the magic mirrors based on their size and functionality.

ii. Tablet sized - A magic mirror can essentially be as compact as a tablet. In this scenario, it functions as a camera, a mirror, and a computer all in one device. Tablet-based magic mirrors are currently utilized in salons for makeup and hairstyling, where they leverage augmented reality technology to, for instance, apply virtual makeup on clients. Naturally, any tablet can also be utilized at home. It's also feasible to mirror a tablet or Smartphone screen to a home television using a Chrome cast or Apple TV device. Furthermore, some smart TVs can directly receive a video stream from mobile devices without any intermediate hardware.

iii. Two-way magic mirrors - There is larger magic mirrors equipped with a semi-transparent two-way film. They look just like conventional glass mirrors until they are turned on. When activated, these mirrors feature a "smart area" that occupies a section of the mirror's surface and can present various visual elements, including text, video, or other forms of multimedia.

iv. Public magic mirrors - Magic mirrors found in public areas such as retail shops or shopping centers can be considerably larger, ranging from 65 to 75 inches. These mirrors are built for shared use instead of personal interaction, which means they usually do not include a user interface. Consequently, they often do not provide any direct control for users. Nevertheless, some versions may be able to interpret gestures or offer restricted control through a user's Smartphone or mobile device.

IV. PRINCIPLES OF MAGIC MIRROR

The essential component of a smart mirror is the two-way mirror. This unique glass behaves like an ordinary mirror by reflecting light while also permitting visibility of a digital display located behind it. The display utilizes technologies such as LCD or OLED to present clear images and data. In the background, a computer or microcontroller plays a crucial role. It operates the display and links the mirror to the internet. This internal mechanism facilitates a range of smart features, transforming the mirror into more than just a basic reflective surface. Additionally, some smart mirrors are equipped with motion sensors that enhance their functionality and interactivity. These sensors recognize when you are nearby, enabling the mirror to power on or modify its display settings automatically. Intelligent mirrors offer a range of information such as the time, weather conditions, news updates, and calendar appointments. This data is displayed on the digital interface embedded in the mirror. Users can customize the display to emphasize the information that is most important to them. Interactivity is a key feature as well. Numerous smart mirrors utilize touch screen capabilities or voice commands, making interaction simple. Some models even incorporate gesture recognition, responding to basic hand movements. Smart mirrors typically connect with smart phones and other smart home gadgets. This connectivity allows you to manage various elements of your home environment, enjoy music, or make phone calls directly through your mirror.

V. COMPONENTS OF MAGIC MIRROR TECHNOLOGY

Hardware requirements

i. Raspberry Pi 3 - The proposed model uses a Raspberry Pi 3 as its primary control hub. This Raspberry Pi has a micro SD card inserted, which contains the Raspbian operating system. The Magic Mirror software can be executed on this OS to operate the application. The monitor will receive input from the Raspberry Pi. The hardware configuration is straightforward. It is necessary to hide the components so that they appear to be a regular mirror. Securely mount the Raspberry Pi on the rear side of the monitor, and then carefully place the two-way mirror on the front surface of the monitor. For the finishing touches, a custom-made wooden or plastic frame can be utilized.
ii. LCD Monitor
iii. SD Card
iv. Keyboard and Mouse
v. VGA to HDMI Converter

Software requirements

i. Raspberry Pi OS
ii. Windows OS

VI. ADVANTAGES AND FEATURES

iii. A smart mirror is termed "smart" because it has the capability to show various contents on its display. It can be effortlessly tailored to present essential information such as social media updates, news alerts, and more.
iv. We can also incorporate voice commands through Google's Home Assistant or Amazon's Alexa, allowing you to pose questions, create essential reminders, or manages other smart devices in your environment. You can easily check for updates using voice commands.
v. We can engage in various activities at the same time, such as browsing the web while staying updated on new releases, literature, and current events.
vi. LED lights and motion sensors can be utilized to produce various moods.
vii. We are able to control security cameras, manage security alarms, operate smart locks for windows and doors, and handle doorbell functions.
viii. A wireless electronic frameless display capable of presenting different kinds of information using widgets. The touch screen mirror feature on your smart mirror enables you to engage with it.
ix. The integrated stereo speakers create a stereo effect while producing sound and the built-in microphone captures audio for both communication and instructions.
x. The surface water and scratch resistance cannot be damaged easily.

DISADVANTAGES

i. It’s very cost effective system.
ii. Like any intelligent device, there are possible privacy concerns, particularly if the mirror is equipped with a camera or microphone.
iii. The technology can be daunting for certain users, especially for those who lack technical skills.
iv. It can be inconvenient to maintain and update the software on smart mirrors on a regular basis.
v. Numerous functions depend on internet access, which means that their performance might be restricted during disruptions.
vi. Depending on the technology employed, certain smart mirrors may not deliver the same quality of reflection as conventional mirrors.

VII. ROLE OF MIGIC MIRROR TECHNOLOGY IN LIBRARY

As technology progresses, the applications of magic mirrors are becoming increasingly diverse; these tools are being utilized in libraries to support users. A magic mirror equipped with a camera and a Wi-Fi-enabled sensor facilitates interaction between library patrons and computers. It provides rapid and effective assistance, such as identifying locations, reviewing content, and offering similar materials, all designed to save users' time. This service delivers information about newly released publications, keeps users informed on contemporary topics, and helps users find documents that meet their specific needs. Furthermore, user reviews are stored within the database. This system functions as a kiosk or tool for document searches. When an individual carrying a book enters the camera's field of view, the camera begins to capture the image, and the system’s algorithm starts to track information about the book's title along with additional details like related titles and reviews. The results are then displayed on the monitor.

VIII. CONCLUSION

This research introduces the concept of magic mirrors in institutional libraries to improve their service efficiency. The magic mirror represents a promising emerging technology that can engage patrons by offering innovative, evolving, and more convenient services. By implementing the magic mirror technology, academic and institutional libraries can boost profitability through better resource utilization and the enhancement of management and reference services. The anticipated system is designed to improve user convenience and is expected to be used effectively in the future.

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