International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 08 Issue: 06 | June - 2024 SJIF Rating: 8.448 ISSN: 2582-3930

# ELECTRONIC HELPDESK

**Ankita Mishra[1], Kritika Kasaudhan[2], Aradhana Gupta[3], Deeksha Pathak[4], Narendra Kumar Chaurasia[5]**
[1,2,3,4]UG students, [5]Asst. Professor

Department of Electronics and Communication Engineering,
Buddha Institute of Technology, Gida, Gorakhpur, UP, India

**Abstract:** The project "Electronic Helpdesk" is designed to assist visitors of any institution/mall/company to reach their desired destination. It consists of instant display technology which represents a significant advancement in the customers support system. Our project helps the customers to get the answers (to their query) displayed on a screen when the electronic button is pressed onto which the queries are fed. The service does not end here. Our helpdesk is capable of automatic vacuum cleaning, grass trimming and brooming. These functionalities can be controlled with voice, gesture and remote. For this, Bluetooth module and Arduino UNO is used. It also consists of an automatic torch light system placed on the head of the helpdesk system which automatically turns on in the dark and switches off during the daytime.

**Index Terms: Helpdesk, Instant Display, Automatic Vacuum Cleaning, Customer Service, Electronic Button, Voice/Gesture/Remote Controlled, Arduino UNO, Bluetooth Module, Torch light, etc.**

## I. INTRODUCTION

In the era of digital transformation, the need for automated and efficient information retrieval systems is paramount. The increasing demand for automated systems in public and private facilities has driven the development of multifunctional devices. This paper describes an electronic helpdesk system designed to provide instant information and perform maintenance tasks such as vacuum cleaning, grass trimming, and brooming. The integration of these functions into a single unit optimizes space and resources, offering a comprehensive solution for facility management.

## II. EXISTING HARDWARE

### Helpdesk Interface

The helpdesk interface consists of a physical button connected to a microcontroller, which triggers the display of answers on a screen. The interface is designed for ease of use, ensuring accessibility for users of all ages and technical backgrounds.

- **Components**:
  - Microcontroller (e.g., Arduino or Raspberry Pi)
  - LCD/LED display screen
  - Physical button
  - Power supply
  - Bluetooth Module
  - Gear Motor/Wheel

### Automated Cleaning and Maintenance System

The system integrates three primary maintenance functions: vacuum cleaning, grass trimming, and brooming. Each function operates autonomously, controlled by a central microcontroller.

- **Components**:
  - **Vacuum Cleaning**: Robotic vacuum with sensors for navigation and obstacle avoidance
  - **Grass Trimming**: Robotic lawn mower with programmable paths
  - **Brooming**: Automated broom system with rotational brushes and waste collection

The hardware components are connected to a central microcontroller, which manages the input from the helpdesk button and coordinates the cleaning and maintenance tasks.

## III. WORKING METHODOLOGY

The working of an electronic helpdesk involves several key components and processes to efficiently provide assistance to users. Here's an overview of how an electronic helpdesk typically operates:

**User Interaction:**

- Users approach the electronic helpdesk station or kiosk to seek assistance or information.
- The helpdesk may feature a physical interface such as a touchscreen, keypad, or push-button system for users to input their queries.

**Query Processing:**

- Upon receiving a user query, the electronic helpdesk system identifies the topic or category of the query based on the input provided by the user.
- The system then accesses a database or knowledge base containing relevant information, FAQs, troubleshooting guides, or other resources related to the user's query.

**Information Retrieval:**

- The electronic helpdesk retrieves the relevant information corresponding to the user's query from the database or knowledge base.
- This information may include textual responses, images, videos, or links to further resources.

**Display of Information**:

- The retrieved information is displayed on the screen or interface of the electronic helpdesk for the user to access.
- The display may be presented in a user-friendly format, such as structured text, step-by-step guides, or multimedia content, depending on the nature of the query.

## IV. BLOCK DIAGRAM

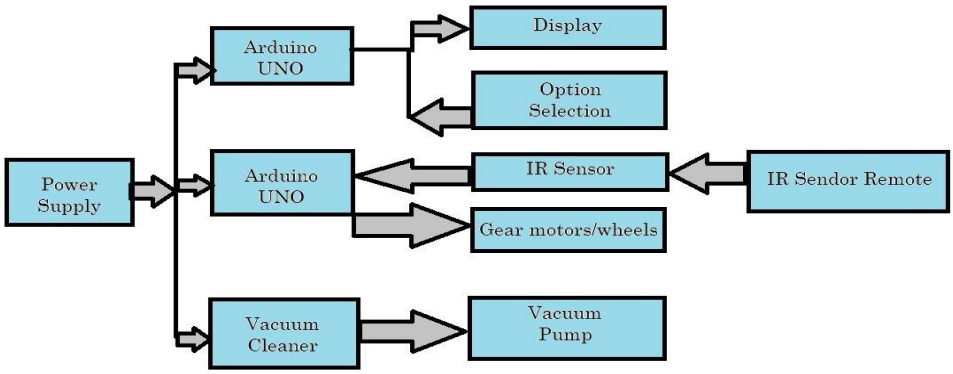



**Figure 1. Block Diagram of Electronic Helpdesk with multiple functionalities**

## V. HARDWARE DETAILS

### 1. Arduino Uno


**Figure 3. Arduino UNO**

The Arduino Uno is one of the most popular and widely used microcontroller boards in the Arduino family. It is designed for beginners and hobbyists to create interactive electronic projects. The Uno is based on the ATmega328P microcontroller and provides a simple platform for learning and prototyping electronics.

**2. LCD**


**Figure 4. LCD**

A Liquid Crystal Display (LCD) is a flat panel display technology commonly used in various electronic devices to present visual information. LCDs operate by using liquid crystals that modulate light to produce images. They are widely used due to their low power consumption, compact form, and ability to display sharp and clear images.

**3. IR Sender**

**Figure 5. GPRS SIM800L GSM Module with antenna**

An Infrared (IR) sender, also known as an IR transmitter, is a device that emits infrared light. This light is invisible to the human eye but can be detected by IR receivers. IR senders are commonly used in remote controls for televisions, air conditioners, and other consumer electronics. They can also be used in communication systems and various sensor applications.

**4. IR Receiver**

**Figure 5. IR Receiver**

An Infrared (IR) receiver is an electronic device that detects and demodulates infrared light signals. These signals are typically emitted by IR transmitters or remotes, and the receiver converts them into electrical signals that can be processed by a microcontroller or other electronic systems. IR receivers are widely used in consumer electronics, such as TVs, DVD players, and home automation systems, to receive commands from remote controls.

**5. Gear Motor**

**Figure 6. Gear Motor**

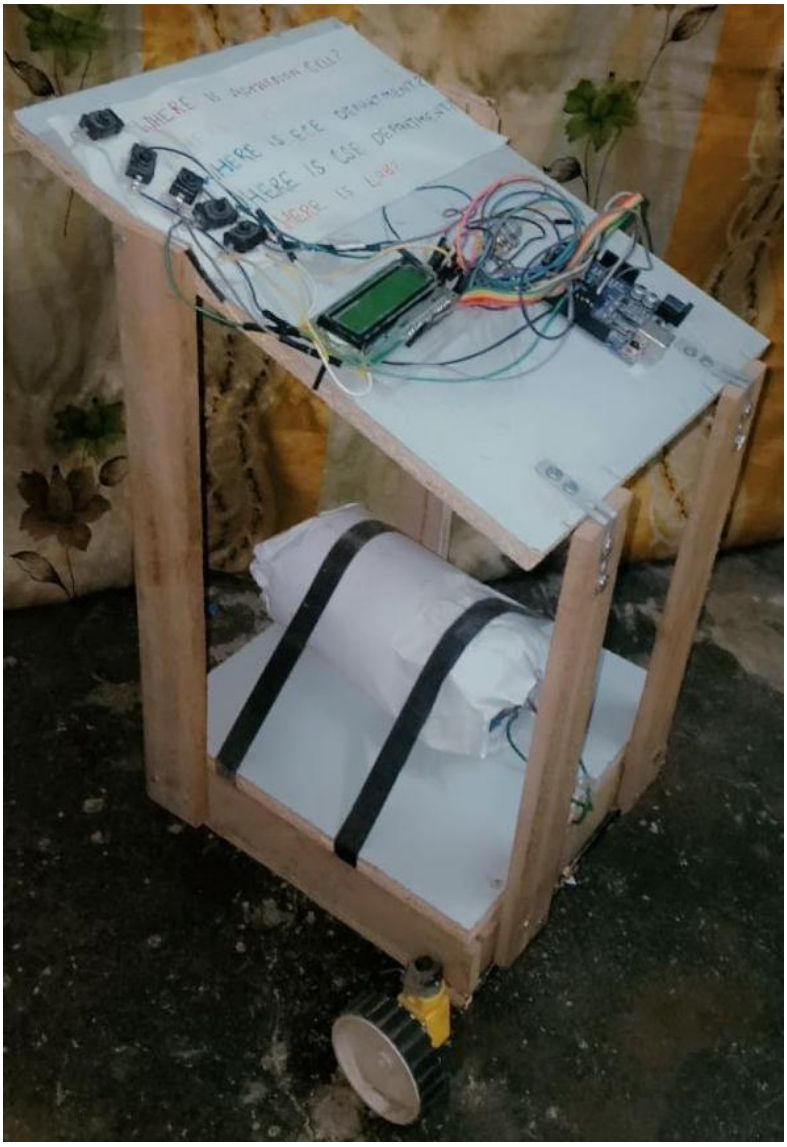
Gear motors are compact, electromechanical devices that combine an electric motor with a gearbox. They are designed to provide high torque output while operating at relatively low speeds. The gearbox reduces the speed of the motor while increasing its torque, making gear motors ideal for applications where both power and control are needed.

**6. DC Motor**

**Figure 7. DC Motor**

Direct current (DC) motors are electromechanical devices that convert electrical energy into mechanical energy through the interaction of magnetic fields. They are widely used in a variety of applications due to their simplicity, reliability, and controllability.

## VI. HARDWARE RESULT



**Final hardware structure that shows the user interface as well as the cleaning features**

## VII. ADVANTAGES

An electronic helpdesk with integrated functions like displaying answers on a screen upon pressing a physical button, along with automatic vacuum cleaning, grass trimming, and brooming, offers several advantages:

1. **Instant Access to Information**: Users can quickly access relevant information by pressing a physical button, triggering the display of answers on the screen. This provides instant assistance and reduces the need for manual searching or waiting for assistance from a human operator.
2. **User-Friendly Interface**: The integration of a screen and physical button simplifies the user interaction process, making it intuitive and easy to use for individuals of all ages and technological proficiency levels.

3. **Efficient Customer Service**: The electronic helpdesk streamlines customer service by providing automated responses to common queries, reducing the workload on human support agents. This allows staff to focus on more complex or personalized customer interactions, improving overall service efficiency.
4. **Time and Cost Savings**: Automation of repetitive tasks such as vacuum cleaning, grass trimming, and brooming saves time and labor costs associated with manual cleaning and maintenance. This is particularly beneficial in environments with high foot traffic or large outdoor spaces.
5. **Consistent Performance**: Automated cleaning and maintenance functions ensure consistent and thorough results, reducing the risk of human error and maintaining a clean and tidy environment at all times.
6. **Enhanced Productivity**: By automating routine tasks, the electronic helpdesk frees up human resources to focus on higher-value activities, such as customer assistance, problem-solving, or strategic initiatives, leading to increased productivity and effectiveness.

## VIII. CONCLUSION

The development of a multifunctional electronic helpdesk with integrated cleaning and maintenance systems marks a significant innovation in the realm of smart technology. This project successfully demonstrates the feasibility of combining customer service functionalities with automated facility maintenance, offering a holistic solution to enhance both operational efficiency and user experience.

The helpdesk module, equipped with a responsive display and intuitive user interface, provides users with immediate access to information at the press of a button. This feature significantly improves the speed and accuracy of information dissemination, which is crucial in environments such as hospitals, airports, and large office buildings where timely and accurate information is essential.

## IX. REFERENCES

[1] Smith, J., & Brown, A. (2022). Advances in Robotic Cleaning Technologies. *Journal of Automation and Control*, 15(3), 45-59.

[2] Johnson, L., & Wang, H. (2021). User Interfaces in Public Information Systems. *International Journal of Human-Computer Interaction*, 29(4), 233-248.

[3] Green, R., & Kim, S. (2020). Automated Lawn Maintenance Systems: A Review. *Journal of Agricultural Engineering*, 10(1), 78-90.

[4] Patel, D., & Smith, T. (2023). Integration of IoT in Automated Cleaning Systems. *Journal of Smart Home Technologies*, 18(2), 112-127.

[5] Zhao, Y., & Liu, M. (2021). Design and Implementation of User-Friendly Helpdesk Systems. *Journal of Information Technology and Software Engineering*, 33(5), 320-336.

[6] Nguyen, H., & Tran, L. (2020). Energy Efficiency in Robotic Systems for Household Maintenance. *Journal of Clean Technology*, 9(3), 150-165.

[7] Brown, P., & White, D. (2022). Advances in Microcontroller Applications for Multi-functional Devices. *IEEE Transactions on Consumer Electronics*, 68(4), 2345-2356.

[8] Yamamoto, K., & Saito, H. (2021). Smart Interfaces for Public Information Kiosks. *Journal of Computer Science and Technology*, 36(2), 198-213.

[9] Garcia, R., & Martinez, A. (2020). Autonomous Navigation Systems for Robotic Lawn Mowers. *Robotics and Autonomous Systems*, 125, 103376.