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MAID ROBOT USING RFID FLOOR TAGS FOR SERVICE THE USER REQUEST IDENTIFICATION

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ABSTRACT

The " Maid Robot Using RFID Floor Tags for service the User Request Identification" project introduces an innovative solution to enhance workplace efficiency and convenience. In office environments, the need for seamless and swift distribution of materials and services is crucial. This project leverages Radio-Frequency Identification (RFID) technology, user request identification, and autonomous navigation to create a versatile service robot capable of fulfilling employee requests efficiently.

In modern offices, the timely delivery of materials and services, such as stationery or documents, is vital to maintaining productivity. Traditional methods often involve human messengers or fixed delivery routes, which can be time-consuming and inefficiently.

This project offers a smart alternative by employing a service robot equipped with RFID technology. RFID tags are strategically placed on the office floor, particularly at junctions and designated drop-off points. When an employee requires a specific item, they can send a request to a central control room.

Upon receiving the request, the central control room dispatches the service robot. The robot autonomously navigates the office environment, following a predefined path. At each junction, it scans the RFID floor tags to determine the correct route to take, ensuring it reaches the destination efficiently. Once the robot arrives at the employee's location, it scan the face of the user by using the camera after scanning the correct person only it will open the the box using the servo motor and then requested item is securely delivered. Confirmation of the task completed is displayed on LCD and then returns the robot to the central control room.

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The Maid Robot Using RFID Floor Tags for service the User Request Identification project reimagines workplace logistics, offering a practical and efficient solution for internal material distribution. By combining RFID technology with autonomous navigation and user request identification, it streamlines office operations, reduces human intervention, and enhances overall workplace productivity.

INTRODUCTION

One of the most promising innovations comes in the form of the Maid Robot, a followed path in office assistant designed to seamlessly integrate into daily life. What sets thisrobot apart is its utilization of RFID (Radio-Frequency Identification) floor tags, introducing anovel approach to user request identification and service provision.

The Maid Robot represents a paradigm shift in office automation, leveraging RFID technology to enhance user experience and streamline office tasks. RFID floor tags are strategically placed throughout the living space, forming an intelligent network that enables the robot to navigate efficiently and respond dynamically to user needs.

This innovative approach not only enhances the efficiency of office chores but also ensures a personalized and responsive interaction between the user and the Maid Robot. By assigning unique identifiers to different areas or objects through RFID floor tags, the robot canseamlessly adapt its behavior based on the specific requirements of each location, providing acustomized and intelligent service experience. Imagine a office where the Maid Robot anticipates your needs by recognizing your location and responding proactively to your requests. Whether it's managing daily chores, fetching items, or providing information, the RFID floor tax system empowers the robot to navigate and execute tasks with unparalleled precision.

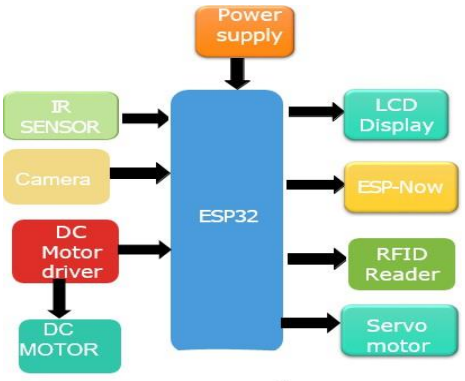


Figure.1 Block diagram for Robot

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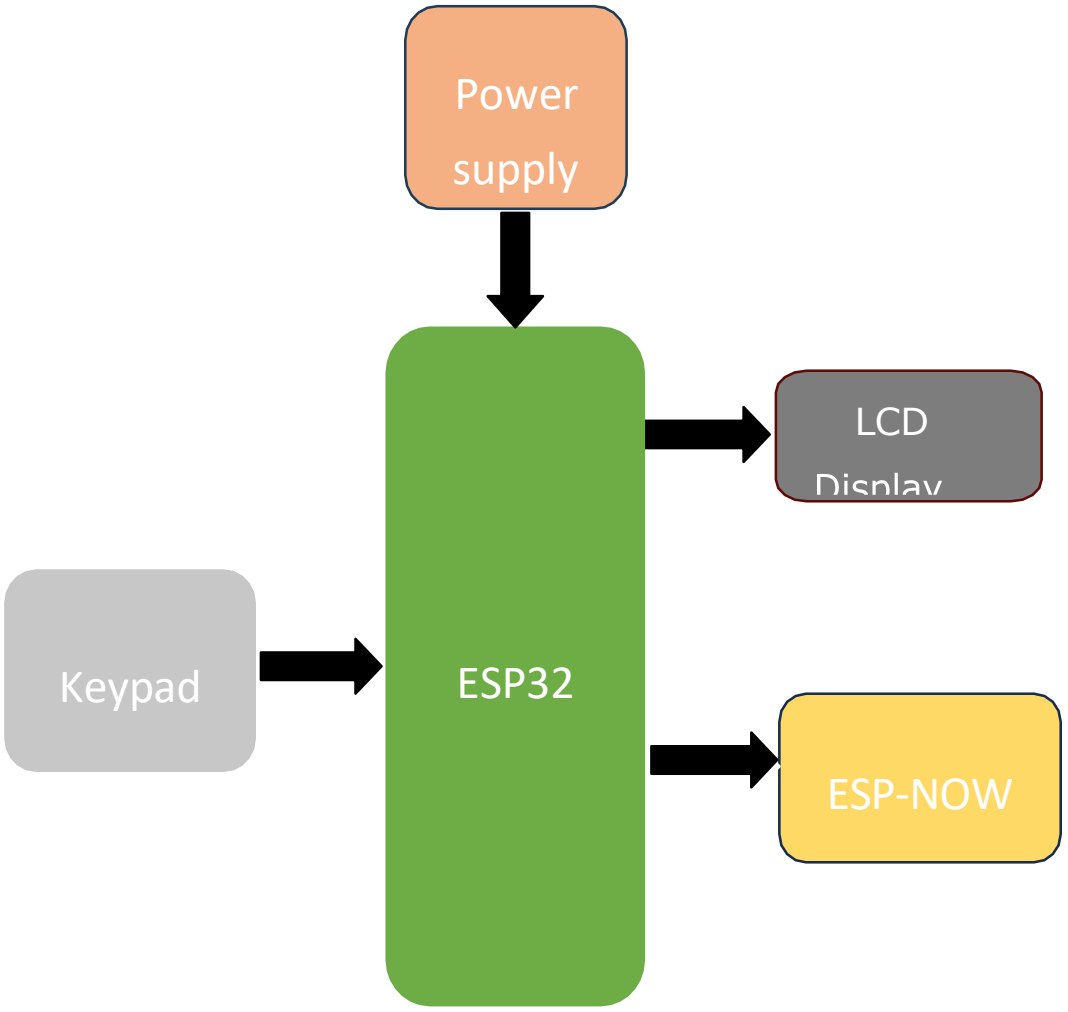


Figure.2 Block diagram User

OBJECTIVE

The " Maid Robot Using RFID Floor Tags for service the User Request Identification" project introduces an innovative solution to enhance workplace efficiency and convenience. In office environments, the need for seamless and swift distribution of materials and services is crucial. This project leverages Radio-Frequency Identification (RFID) technology, user requestidentification, and autonomous navigation to create a versatile service robot capable offulfilling employee requests efficient.

LITERATURE SURVEY

1. **Shiraishi et al.** (2008) discussed RFID based on robot using service the user request estimation. Wang et al. (2013) explained RFIDpositioning office tracking mechanism.

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2. The study by **Zhu et al.** (2020) explained the usage of RFID technology for similar purposes. RFID is a digital enabler, complemented by unified standards across industries, high compatibility with IT infrastructure, ease of use, and interoperability among functional areas that help businesses evolve as digital entities (Deepu & Ravi, 2021; Kamble et al., 2019). RFID helps to digitize supply chains as the technology generates automated sensor data that can be further analyzed for automation and optimization.

As of my last knowledge update in January 2022, I can provide a general overview of some concepts related to Maid Robots, RFID technology, and user request identification. However, please note that the specific literature on a Maid Robot using RFID floor tags for user request identification may have advanced since then. I recommend checking recent academic databases, journals, and conference proceedings for the latest research in this specificfield.

PROPOSED SYSTEM

The proposed maid robot system harnesses the power of RFID floor tags to streamlineoffice chores with precision and efficiency. At its core, the system revolves around a sophisticated robotic platform, equipped with advanced sensors for navigation and obstacle avoidance. This cutting-edge technology is augmented by an RFID reader seamlessly integrated into the robot's design, enabling it to identify strategically placed RFID floor tags throughout the office.

The RFID floor tags play a pivotal role in this choreography. Strategically positioned around the house, each tag corresponds to a specific location or task, providing the robot with realtime information about its whereabouts and triggering specific actions based on the user's identified needs. These tags can also include additional details about the task at hand, enhancingthe robot's contextual understanding and adaptability.

As the maid robot navigates the household using its sensors, the RFID reader identifiesfloor tags, allowing the system to precisely determine the robot's location and execute tasks accordingly. Real-time updates are seamlessly communicated to users through the ESP-NOWprotocol, ensuring transparency and keeping users informed about the progress of theirrequested services.

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RESULTS

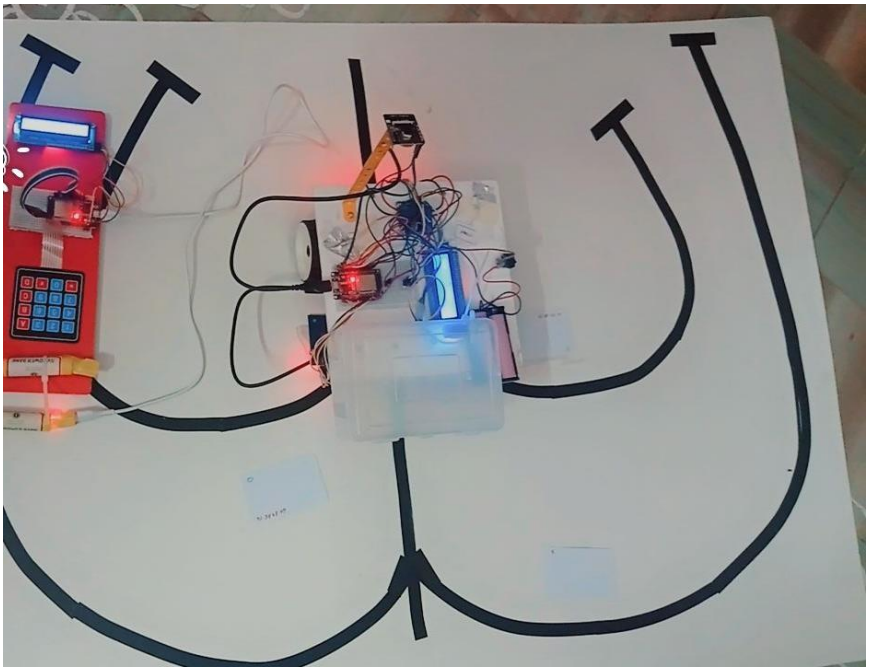


Figure.3 Working Kit

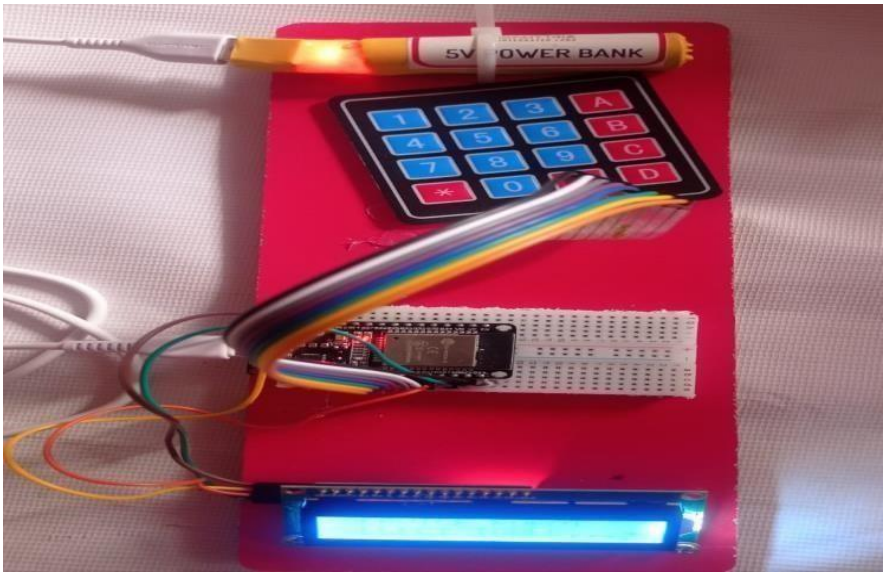


Figure.4 Keypad controlling

ADVANTAGES

Enhanced Efficiency: The system significantly improves workplace efficiency by automating material and service distribution, reducing human intervention, and minimizing delays.

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Time Savings: Traditional methods of material delivery can be time-consuming, but your robot can swiftly navigate the office, ensuring timely deliveries.

Cost-Effective: Over time, the investment in a service robot can lead to cost savings as it replaces the need for full-time human messengers.

Productivity Boost: Employees can focus on their tasks without interruptions, knowing that the robot can efficiently handle their material requests.

Data Tracking: The system provides a means to track the robot's activities, helping in monitoring and improving overall operations.

APPLICATION

Hospitals: Service robots could be used to transport medication, medical equipment, and documents within healthcare facilities, ensuring the timely and secure delivery of critical items.

Manufacturing Facilities: In manufacturing plants, these robots can efficiently transport components and tools to different workstations, aiding in the production process.

Warehouses: Robots can be employed to move inventory, reducing the need for manual handling of goods and improving warehouse logistics.

Hotels: In the hospitality industry, such robots could provide room service, deliver amenities, or assist in cleaning tasks.

Retail Stores: Robots can help in restocking shelves, moving items between store sections, oreven assisting customers in finding products.

Airports: Service robots can assist in delivering luggage, providing information to travelers, and supporting various tasks in airport operations.

CONCLUSION

The maid robot was successfully designed to provide autonomous navigation for indoor applications using RFID floor tags. The integration of RFID technology enables seamless communication between the user and the robot, streamlining task execution and enhancing user experience. By leveraging RFID floor tags, the maid robot can accurately identify user requests and navigate through the environment with precision.

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Beyond the realm of operational efficiency, RFID technology introduces a deeply personalized touch to the user experience. By empowering maid robots to not only identify but also proactively respond to individual user requests, this integration sets the stage for a truly seamless and tailored service. Users are met with a robotic assistant that not only meets their explicit expectations but also adeptly anticipates their evolving needs, fostering animmersive and highly satisfying interaction. This personalization becomes a cornerstone in cultivating a positive perception of automated assistance, paving the way for wider acceptance and integration into daily life.

FUTURESCOPE

Future maid robots can be equipped with advanced artificial intelligence (AI) algorithms to continually improve their ability to understand and respond to user requests. For instant AI can help to order based on demand and be able to react to situations such as low stock or out- of-stock.

Integrating additional sensors, such as cameras and microphones, could enable maidrobots to gather more comprehensive information about their surroundings.

Adaptability Learning Capabilities : Future iterations of these robots could feature advanced learning capabilities, allowing them to adapt to individual user preferences over time. By leveraging artificial intelligence and machine learning algorithms, maid robots could optimize cleaning routines, recognize user habits, and tailor their services accordingly. This adaptability enhances the overall efficiency andeffectiveness of household tasks.

Expanded Applications Beyond Household: While initially designed for residential settings, the maid robot's utility could extendto commercial spaces, such as hotels and healthcare facilities. The incorporation of RFID floor tags facilitates navigation and task execution in diverse environments. This expansion of applications could contribute to the widespread adoption of servicerobots across various industries.

Enhanced User Interaction : RFID floor tags enable a more intuitive and userfriendly interaction with the robot. Users can set specific cleaning preferences, designate areasfor focus, or even schedule tasks through a user-friendly interface. The bidirectionalcommunication between the robot and the RFID floor tags ensures accurate interpretation of user requests, enhancing overall user satisfaction.

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Challenges and Considerations : Despite the promising future, challenges such as privacy concerns, security of user data, and the need for standardized communicationprotocols must be addressed. Ensuring that these maid robots adhere to ethical standards and regulations will be crucial for their widespread acceptance and integration into everyday life.

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