RAJALAKSHMI
ENGINEERING COLLEGE
An AUTONOMOUS Institution
Affiliated to ANNA UNIVERSITY, Chennai

# Department of ECE

## GE19612 - Professional Readiness for Innovation, Employability and Entrepreneurship (Mini Project)

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# SMART SHOPPING CART

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# OUTLINE

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# ABSTRACT

The Smart Shopping Cart revolutionizes the shopping journey by integrating technology for convenience. Customers input their list into a user-friendly interface, ensuring accuracy. Equipped with a line follower and RFID reader, the cart autonomously navigates the store, halting at tagged items on the list. A nearby robotic arm swiftly retrieves items, streamlining the process.

This hands-free approach enhances efficiency for customers and reduces manual labor for store personnel. Overall, the project represents a significant leap in retail technology, promising a seamless shopping experience for all.

# Objective

- To Develop a user-friendly interface using an LCD display and buttons for seamless input of shopping lists by users.
- To Integrate RFID tags along with a line follower system to enable autonomous navigation of the smart shopping cart to designated section where desired items are located, reducing search time and improving overall shopping efficiency.
- To Implement robotic Arm to pick and place products in list given by the customer.

# Literature Survey

| TITLE | YEAR | AUTHOR | TECHNIQUE |
|---|---|---|---|
| A IoT-based Smart Cart System | 2022 | Sakthivel S, Akash Ram R. K, Sidarth Sai B, Vijaya Kesavan K. M, Ganesh Kumar C, | RFID, YOLO |
| Smart Shopping Cart using IOT and robotic arm | 2021 | Anitta D, Sahana Siddappa Guddad, Anusha S, Karthik Yanamala, Sahithi S | Robotic Arm, IoT, RFID |
| IOT Based Smart Shopping System | 2021 | Vidumith Perera, Lakdinu Ekanayake, Ama Bandara, Dinithi Shakya, Udesh S. Oruthota | Internet of Things (IoT) |
| Simultaneously Shop, Bag, and Checkout (2SBC-Cart): A Smart Cart for Expedited Supermarket Shopping | 2020 | Thomas Arciuolo, Abdel-shakour Abuzneid | RFID technology, barcode readers, Load Cells, Raspberry Pi, Wi-Fi, IoT, GPS, and WSN |
| Smart Cart: A Distributed Framework | 2020 | Bipin Kumar Yadav, Akash Burman, Abhoy Mahato, Manish Choudhary, and Anirban Kundu | RFID |

| TITLE | YEAR | AUTHOR | TECHNIQUE |
|---|---|---|---|
| A Smart Trolley for Smart Shopping | 2020 | A. Yewatkar, F. Inamdar, R. Singh, Ayushya and A. Bandal | Internet of Things (IoT), RFID |
| IoT Applications on Secure Smart Shopping System | 2017 | Ruinian Li, Tianyi Song, Nicholas Capurso, Jiguo Yu, Jason Couture, Xiuzhen Cheng, | Internet of Things (IoT), RFID |
| Smart Shopping Cart | 2017 | Akshay Kumar, Abhinav Gupta, S. Balamurugan, S. Balaji, R. Marimuthu | Internet of Things (IoT), Sensors |

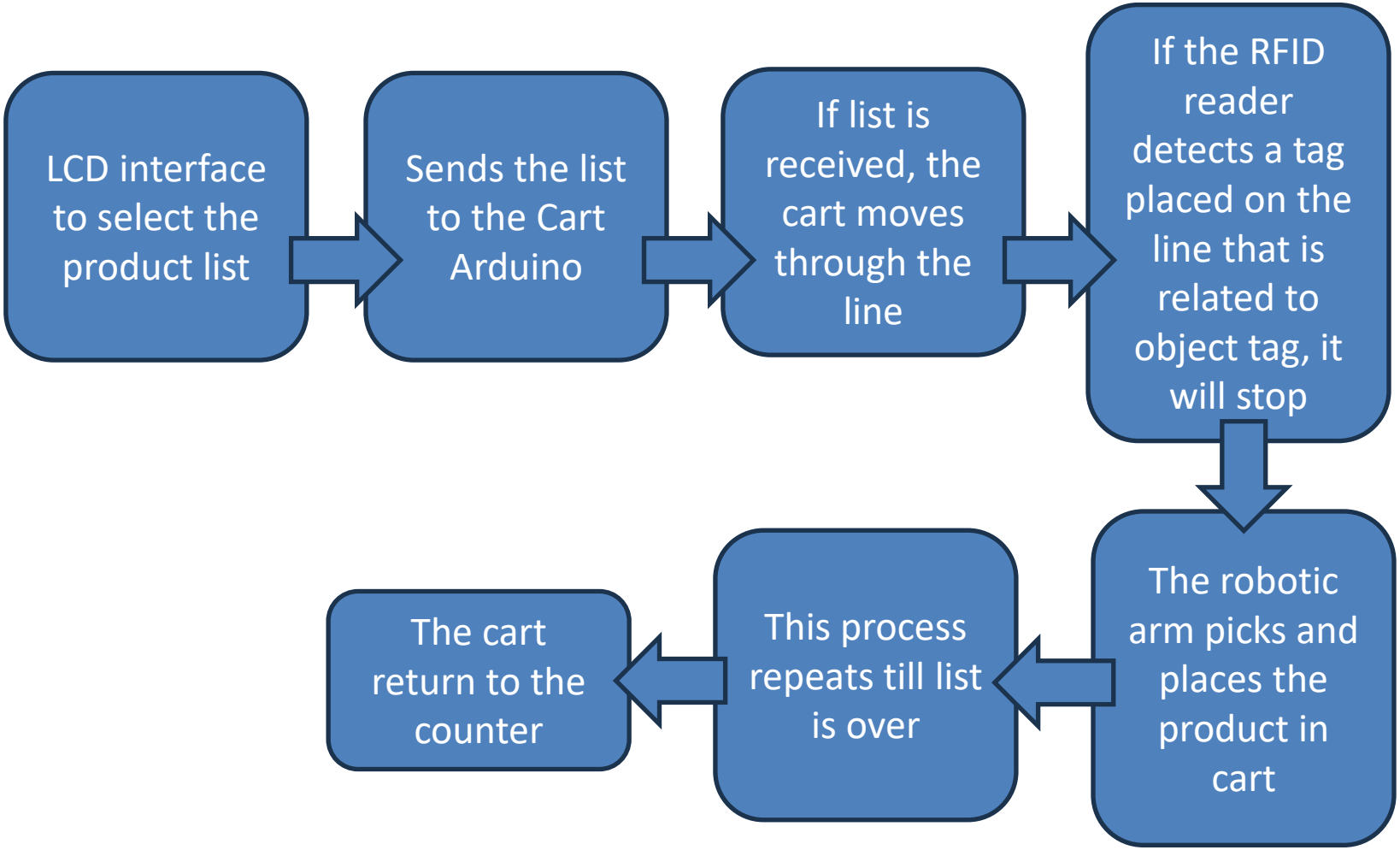
# Summary of Literature

- The examined literature presents innovative approaches to enhance the shopping experience, including RFID-enabled carts and IoT-driven billing systems.
- While these solutions aim to streamline operations and reduce customer waiting times, their scalability and real-world feasibility are not thoroughly explored.
- Questions persist regarding their adaptability to diverse retail environments and large-scale implementation.
- Further research and testing are necessary to assess their effectiveness and address potential challenges before widespread adoption in the retail sector.

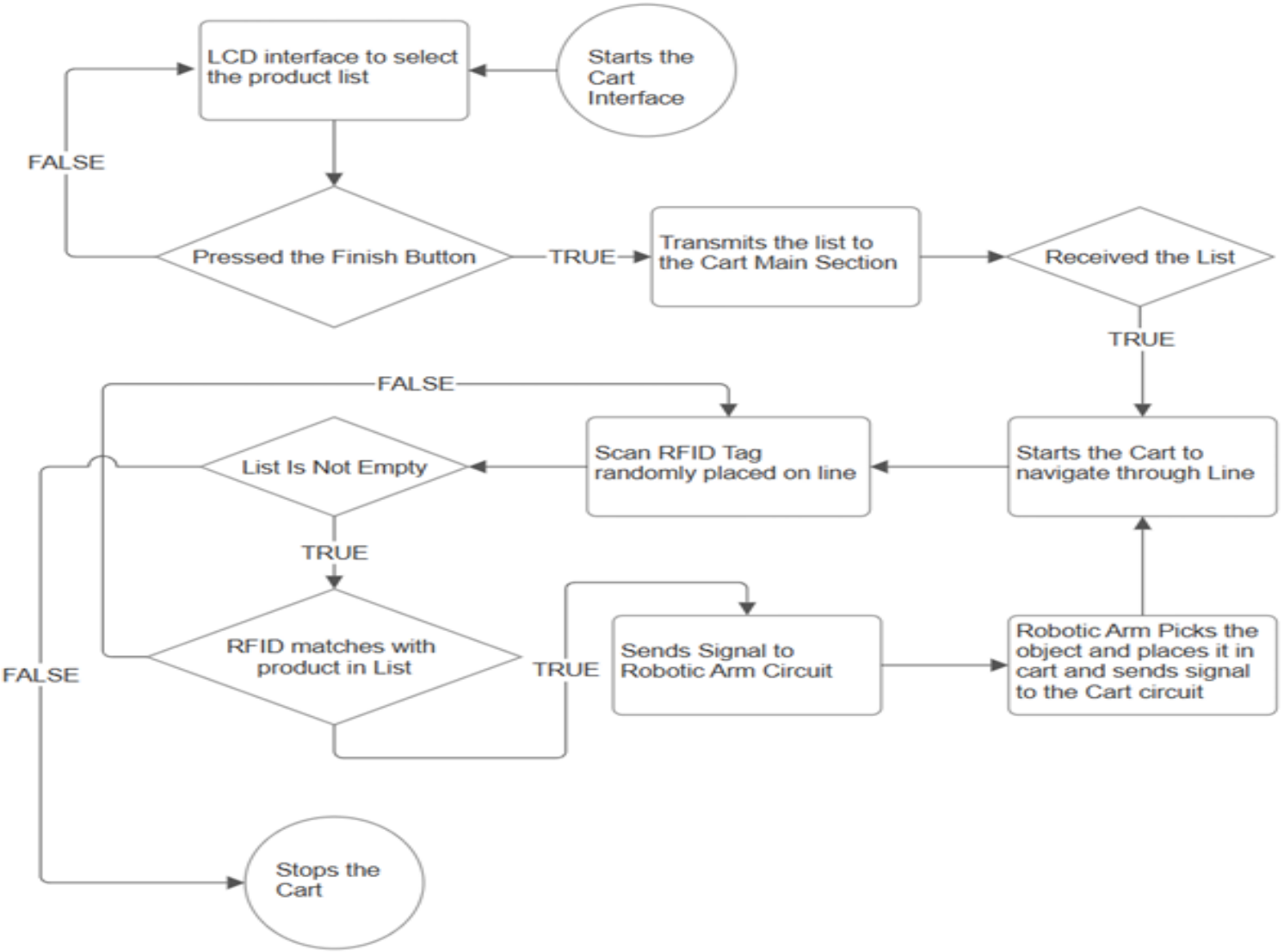
# Proposed System

- The proposed Smart Shopping Cart system combines user-friendly interfaces with advanced features for a hassle-free shopping experience.
- Customers input their shopping lists into the interface, and the cart, equipped with a line follower and RFID reader, autonomously moves through the store aisles.
- As it detects tagged products matching the list, a robotic arm swiftly picks and places them in the cart.
- This synchronized process improves efficiency for both customers and store staff, ensuring a smooth and enjoyable retail experience.

# Proposed System Block Diagram



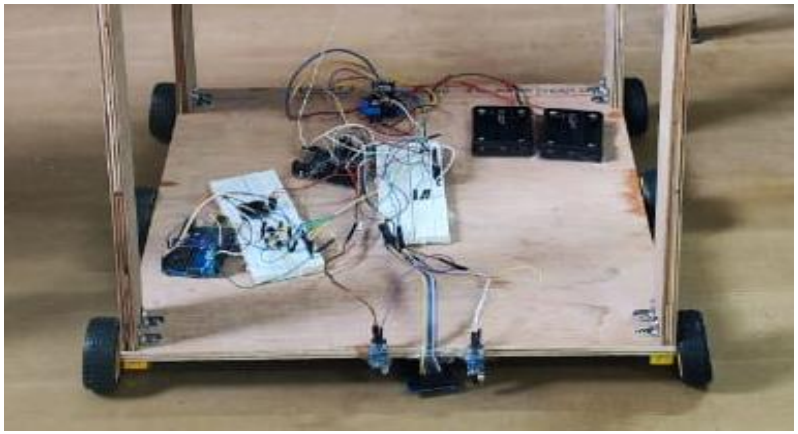
# Proposed System Flow Diagram



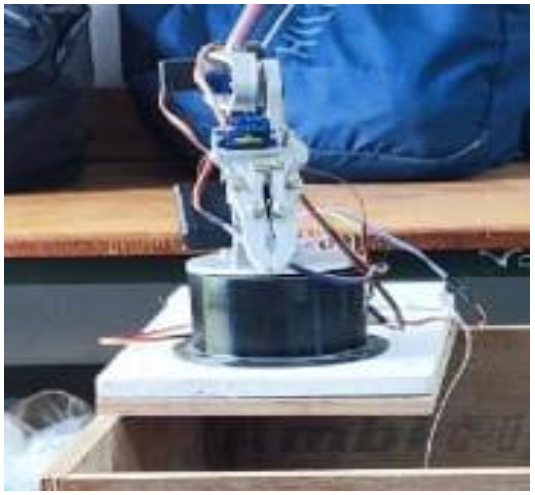
# Novelty in Proposed System

- This is totally an Autonomous Shopping Cart which requires very less human interaction.
- The human should only give the shopping list as an input to the cart through the LCD interface.
- Then the cart automatically detects the objects and moves in the line.
- Each section has a RFID tag in the line and when the RFID reader detects it, it stops and activates the arm which picks and place the products in the list.
- This system is nowhere used in India till now.

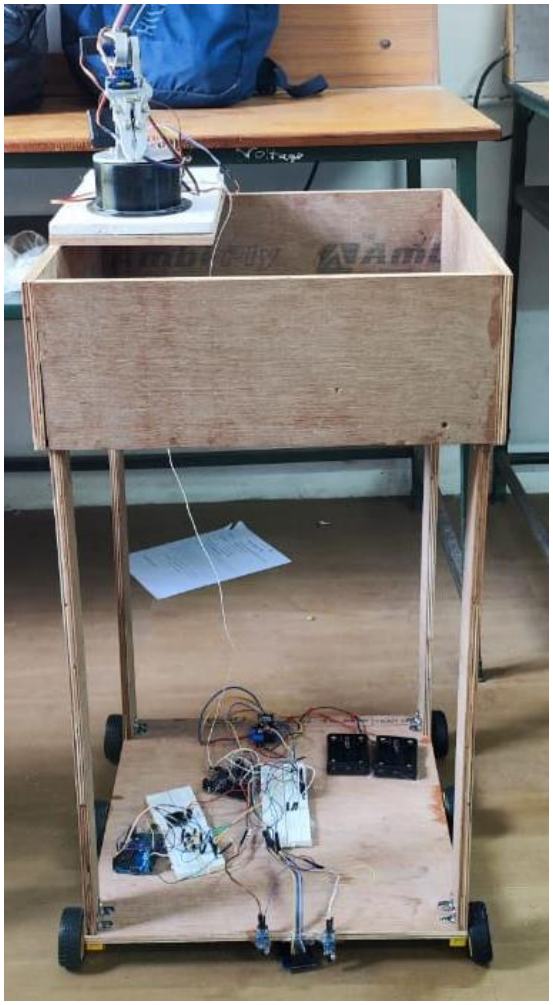
# OUTPUT



User Interface and moving Cart



Robotic Arm



Smart Shopping Cart

# References


1. Sakthivel S, Akash Ram R. K, Sidarth Sai B, Vijaya Kesavan K. M, Ganesh Kumar C, (2022) “ AIoT-based Smart Cart System ”, International Conference on Smart Technologies and Systems for Next Generation Computing.
2. Anitta D, Sahana Siddappa Guddad, Anusha S, Karthik Yanamala, Sahithi S, (2021) “ Smart Shopping Cart using IOT and robotic arm ”, International Conference on Design Innovations for 3Cs Compute Communicate Control.
3. Vidumith Perera, Lakdinu Ekanayake, Ama Bandara, Dinithi Shakya, Udesh S. Oruthota, (2021) “ IOT Based Smart Shopping System “, 10th International Conference on Information and Automation for Sustainability.
4. Thomas Arciuolo, Abdel-shakour Abuzneid, (2020)“ Simultaneously Shop, Bag, and Checkout (2SBC-Cart): A Smart Cart for Expedited Supermarket Shopping “, International Conference on Computational Science and Computational Intelligence.
5. Bipin Kumar Yadav, Akash Burman, Abhoy Mahato, Manish Choudhary, and Anirban Kundu, (2020) “Smart Cart: A Distributed Framework” IEEE 1st International Conference for Convergence in Engineering.
6. A. Yewatkar, F. Inamdar, R. Singh, Ayushya and A. Bandal (2020)“ A Smart Trolley for Smart Shopping ”, International Conference on System, Computation, Automation and Networking.
7. Ruinian Li, Tianyi Song, Nicholas Capurso, Jiguo Yu, Jason Couture, Xiuzhen Cheng, (2017) “ IoT Applications on Secure Smart Shopping System ”, International Journal of Internet of Things, Vol. 4, No. 6, pp. 1945-1954.
8. Akshay Kumar, Abhinav Gupta, S. Balamurugan, S. Balaji, R. Marimuthu, (2017) “ Smart Shopping Cart ”, International conference on Microelectronic Devices, Circuits and Systems.