**BASAVARAJESWARI GROUP OF INSTITUTIONS**

**BALLARI INSTITUTE OF TECHNOLOGY AND MANAGEMENT**

**Autonomous Institute under VTU, Belagavi**

**Recognized by Govt. of Karnataka, approved by AICTE, New Delhi & Affiliated to Visvesvaraya Technological University, Belagavi)**

**"Jnana Gangotri" Campus, No.873/2, Ballari-Hospet Road, Allipura, Ballar1-583 104 (Karnataka) (India)**

**Ph.: 08392 – 237100 / 237190, Fax: 08392 – 237197**

**DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING**

A Project Report on

**“RFID-DRIVEN SHOPPING CART USING ARDUINO”**

Under the guidance of

**Dr. William Thomas H M**

(Assoc. Professor)

**Project Associates**

**NAGARJUNA 3BR21EC405**



**2023-2024**

**BASAVARAJESWARI GROUP OF INSTITUTIONS**

**BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT**

**Autonomous Institute under VTU, Belagavi**

**Recognized by Govt. of Karnataka, approved by AICTE, New Delhi & Affiliated to Visvesvaraya Technological University, Belagavi)**

**"Jnana Gangotri" Campus, No.873/2, Ballari-Hospet Road, Allipura, Ballar1-583 104 (Karnataka) (India)**

**Ph.: 08392 – 237100 / 237190, Fax: 08392 – 237197**

**DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING**

**CERTIFICATE**

Certified Project work entitled on **“RFID-DRIVEN SHOPPING CART USING ARDUINO”** is a bonafide work carried out by **NAGARJUNA (3BR21EC405)** in partial fulfillment for the award of Degree in Bachelor of Engineering in **ELECTRONICS & COMMUNICATION**, as prescribed by **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI** during the academic year 2023-2024. It is certified that all corrections and suggestions indicated for internal assessment have been incorporated in the report submitted to the department library. The project report has been approved as it satisfies the academic requirements in respect of project work prescribed for the Bachelor of Engineering Degree.

**Project guide HOD, Dept. of ECE Principal**

**External Exam Signature with date Name of the Examiner**

**1.**

**2.**

**TABLE OF CONTENTS**

|  |  |  |
| --- | --- | --- |
| **CHAPTER** | **TITLE** | **PAGE NO.** |
|  | **Abstract** |  |
| **Chapter-1** | **Introduction**  **Objectives of project** | **1-3** |
| **Chapter-2** | **Literature Review** | **4-5** |
| **Chapter-3** | **Implementation and Methodology**  **3.1 Software**  **3.2 Hardware**  3.2.1 Arduino nano  3.2.1.1 Arduino nano Pin configuration  3.2.2 16x2 LCD Display  3.2.3 EM-18 Module  3.3.4 Push Button  3.2.5 Red LED  3.2.6 Buzzer  3.2.7 RFID Tag  3.2.8 Zero PCB  3.2.9 Jumper Wires  3.2.10 Power supply  **3.3 Circuit Diagram**  **3.4 Schematic Diagram of Connections**  **3.5 Roadmap for Adding items**  **3.6 Roadmap for Removing items** | **6-21** |
| **Chapter-4** | **Results and Discussion** | **22-24** |
| **Chapter-5** | **5.1 Applications**  **5.2 Advantages**  **5.3 Disadvantages** | **25-27** |
| **Chapter-6** | **6.1 Conclusion**  **6.2 Future Scope** | **28-31** |
|  | **References** | **32** |

**TABLE OF FIGURES**

|  |  |  |
| --- | --- | --- |
| **Fig No.** | **Title** | **Page No.** |
| Fig No. 3.1.1 | Arduino IDE logo | 5 |
| Fig No. 3.1.2 | Arduino IDE Window | 6 |
| Fig No. 3.2.1 | Arduino nano | 7 |
| Fig No. 3.2.1.1 | Arduino nano Pin Configuration | 8 |
| Fig No. 3.2.2 | 16x2 LCD Display | 8 |
| Fig No. 3.2.3 | EM-18 Module | 9 |
| Fig No. 3.2.4 | Push Button | 10 |
| Fig No. 3.2.5 | LED | 11 |
| Fig No. 3.2.6 | Buzzer | 12 |
| Fig No. 3.2.7 | RFID Tag | 13 |
| Fig No. 3.2.8 | Zero PCB | 14 |
| Fig No. 3.2.9 | Jumper Wires | 16 |
| Fig No. 3.2.10 | Power supply | 17 |
| Fig No. 3.3 | Circuit Diagram | 18 |
| Fig No. 3.4 | Schematic Diagram of Connections | 19 |
| Fig No. 3.5 | Roadmap for Adding items | 20 |
| Fig No. 3.6 | Roadmap for Removing items | 21 |
| Fig No. 4.1 | Automatic Bill Shopping cart | 22 |
| Fig No. 4.2 | Scanning Tags to add Items | 22 |
| Fig No. 4.3 | Item Added | 23 |
| Fig No. 4.4 | Scanning Tag to Remove items | 23 |

**ABSTRACT**

In the realm of retail, the integration of technology has become imperative for staying competitive and meeting the evolving demands of consumers. One such technological innovation, Radio-Frequency Identification (RFID), has garnered attention for its potential to revolutionize the shopping experience. This abstract delves into the concept of RFID-driven smart shopping carts and explores their transformative impact on both customers and retailers.

RFID technology, based on radio waves, enables unique identification and tracking of items. When applied to shopping carts, RFID readers integrated within them detect and register items as they are placed inside. This eliminates the need for manual scanning at checkout counters, streamlining the shopping process for consumers.

Moreover, RFID-driven smart shopping carts offer more than just convenience. They provide real-time access to product information, allowing shoppers to make informed decisions by scanning items for details like pricing, nutritional facts, and customer reviews. Additionally, leveraging RFID data and AI algorithms, these carts can offer personalized recommendations and promotions tailored to individual preferences and purchase history, thereby enhancing the shopping experience.

From the retailer's perspective, RFID-driven smart shopping carts offer significant benefits. They enable efficient inventory management by providing accurate and timely insights into stock levels and consumer preferences. This facilitates proactive restocking, reduces instances of stockouts, and improves overall supply chain management.

Furthermore, the streamlined checkout process facilitated by these smart carts enhances operational efficiency for retailers while minimizing waiting times for customers. Integrated payment systems allow for seamless transaction completion, contributing to overall customer satisfaction and loyalty.