



## Automated Product Identification and Tracking System

Shobhana<sup>1</sup>, Roopa<sup>2</sup>, Shruti<sup>3</sup>, Vaishnavi S Dhali<sup>4</sup>

<sup>1</sup>Assistant Professor, Dept. of ECE, FETW, Sharnbasva University Kalaburagi, Karnataka, India.

<sup>2,3,4</sup>UG Scholar, Dept. of ECE, FETW, Sharnbasva University Kalaburagi, Karnataka, India.

**Emails:** Shobana.khanapur@sharnbasvauniversity.edu.in<sup>1</sup>, muchettyroopa@gmail.com<sup>2</sup>,  
srishtisurpur@gmail.com<sup>3</sup>, vaishnavidhali30@gmail.com<sup>4</sup>.

### Abstract

*In modern manufacturing industries, automation has become vital for improving productivity, quality, and efficiency. Product labeling and traceability are essential to ensure accurate product identification and tracking throughout the supply chain. Manual labeling methods are often slow and error-prone, leading to mislabeling and tracking issues. To address these challenges, this project proposes a Smart Automated System for Product Labeling and Traceability. The system uses microcontrollers, sensors, and barcode or RFID technologies to automatically detect, label, and record product information. Data is stored in a centralized database for real-time tracking and easy retrieval. This automation minimizes human effort, reduces errors, and supports quality assurance during production. Designed according to Industry 4.0 principles, it can be extended with IoT connectivity for remote monitoring. Overall, the system offers a reliable and efficient solution for achieving accuracy and complete traceability in modern manufacturing.*

**Keywords:** Automated, Product Identification, Tracking System.

### 1. Introduction

In today's fast-growing industrial and commercial environment, the ability to accurately identify, track, and manage products has become essential for improving operational efficiency. Traditional manual tracking methods are prone to errors, time-consuming, and unable to meet the demands of modern supply chains. To overcome these limitations, automated product identification and tracking systems have emerged as a reliable technological solution. An automated product identification and tracking system uses technologies such as barcodes, QR codes, RFID (Radio Frequency Identification), and sensors to automatically capture, verify, and record product information at every stage of its movement. This ensures real-time visibility, reduces human errors, and enhances productivity in inventory management, logistics, and retail operations. The implementation of such systems allows businesses to monitor stock levels, streamline warehouse operations, prevent losses, and improve decision-making through accurate data. Automated tracking also supports faster checkout processes,

better customer service, and seamless integration with cloud-based databases and enterprise management systems. Overall, this project aims to design and develop an efficient automated product identification and tracking system that can improve accuracy, reduce manual effort, and enhance overall supply chain performance. The system will demonstrate how automation and smart technology can transform product handling from initial entry to final delivery [1].

### 2. Results and Discussion

#### 2.1. Results

The Automated Product Identification and Tracking System worked successfully. The system was able to correctly identify each product using its unique code and update the information in real-time. Product movement was tracked accurately, and the database displayed the correct details without errors. Overall, the system improved speed, reduced manual work, and provided reliable product tracking [2].

#### 2.2. Discussion

The development of the Automated Product



Identification and Tracking System demonstrates how modern identification technologies can significantly improve the accuracy and efficiency of product management processes. The system was designed to minimize human involvement while ensuring real-time monitoring of product flow, and the experimental results indicate that this objective was successfully achieved. One of the key observations during implementation was the effectiveness of automatic data capture. Technologies such as barcodes, QR codes, or RFID tags enabled quick identification, reducing the time required for manual entry and lowering the chances of mistakes. This highlights the importance of automation in environments where large volumes of products must be processed rapidly. Another important finding relates to system scalability and integration. The tracking method proved adaptable to different product categories, and the database structure allowed easy expansion. This suggests that the system can be deployed in various settings—warehouses, retail stores, supply chains—without major structural changes. Integrating the system with inventory management software or cloud databases can further enhance performance [3-5].

### **Conclusion**

The Automated Product Identification and Tracking System successfully demonstrates how image processing and intelligent recognition techniques can be used to identify and track products accurately and efficiently. By using a structured image dataset, proper preprocessing, and suitable algorithms, the system is able to recognize products based on their visual features and associate them with their corresponding IDs or codes. This reduces manual effort, minimizes human error, and speeds up operations in environments such as warehouses, supermarkets, and inventory management systems. The tracking component further helps in monitoring the movement and location of products in real time, improving transparency and control over stock handling.

### **Acknowledgements**

I would like to express my sincere gratitude to my guide for their valuable guidance, support, and suggestions throughout the development of the

Automated Product Identification and Tracking System project. I am thankful to my institution for providing the necessary facilities and resources to carry out this work. I also wish to thank my friends for their constant encouragement and cooperation, which helped me to successfully complete this project.

### **References**

Journal reference style:

- [1]. RMeyer, G. G., Främling, K., & Holmström, J. (2009). Intelligent products: A survey. *Computers in Industry*, 60(3), 137–148.
- [2]. Voipio, V. (2023). The role of radio-frequency identification in supply chain visibility (Master's thesis). LUT University.
- [3]. Free Barcode. (n.d.). Sensors and machine vision in inventory management. Retrieved from Free Barcode website: (put full URL here)
- [4]. GHX. (n.d.). Healthcare automation explained: Benefits, applications and future. Retrieved from GHX website: (put full URL here)
- [5]. D&S Logistics. (2023, April 7). Benefits of warehouse management systems. Retrieved from D&S Logistics website: (put full URL here)