

Coffee Vending Machine using QR Code

1st Shweta Suryavanshi

Department of Electronics and

Telecommunication

Dr. D. Y. Patil. Institute of

Engineering Management

and Research

Pune, India

shweta.suryawasni@dypiemr.ac.in

2nd Pooja Patil

Department of Electronics and

Telecommunication

Dr. D. Y. Patil Institute of

Engineering Management

and Research

Pune, India

poojabpatil2602@gmail.com

3rd Ayush Kholam

Department of Electronics and

Telecommunication

Dr. D. Y. Patil Institute of

Engineering Management and

Research

Pune, India

ayushkholam2003@gmail.com

4th Samarth Harwalkar

Department of Electronics and

Telecommunication

Dr. D. Y. Patil Institute of

Engineering Management

and Research

Pune, India

samarthharwalkar2001@gmail.com

Abstract

In today's fast-paced world, convenience is crucial in determining customer preferences. The combination of technology and everyday products has changed the way we interact with our environment, and coffee vending machines are no exception. This article presents a new approach to coffee vending machines with QR code technology to improve customer convenience and experience. The coffee vending machine concept uses QR code technology to simplify the coffee purchasing process. Users use their smartphones to scan the QR code displayed on the vending machine to access the customer interface where they can customize their coffee order to their liking. The interface has many options, including coffee strength, taste, size and other ingredients so that every user can enjoy the coffee experience. Additionally, the use of QR codes increases security and reduces the risk of theft by eliminating the need for physical payment such as coins or cash. Users can easily pay for coffee through various digital payment platforms integrated into the vending machine interface, adding further convenience to the purchasing process.

I. INTRODUCTION

With the integration of QR code technology, coffee vending machines have undergone major changes, creating a revolution in convenience and efficiency for users. Traditionally, the process of purchasing a cup of coffee from a vending machine involves selection, payment and delivery, often resulting in long queues and understaffing. However, the emergence of QR code-enabled coffee vending machines has brought about a change by offering users a simple and intuitive experience.

1. Elevated User Experience:

QR code technology empowers users to personalize their coffee orders, spanning variables such as strength, flavor, size, and additional ingredients. This customization feature eliminates the need for manual input, reducing wait times and enhancing overall satisfaction.

2. Simplified Payment Mechanism:

By integrating digital payment platforms into the vending machine interface, users can effortlessly complete transactions via their smartphones.

The eradication of physical payment methods such as coins or cash not only enhances security but also expedites the purchasing process.

3. Dynamic Inventory Management:

Leveraging QR code technology enables real-time monitoring and management of inventory and sales data. Vending machine operators gain insights into popular coffee selections, monitor stock levels, and analyze consumer preferences, facilitating optimized inventory management practices.



4. Alignment with Contemporary Consumer Preferences:

QR code-enabled coffee vending machines are tailored to meet the evolving demands of modern consumers in today's digital era. Offering a personalized and convenient coffee purchasing journey, these machines set new standards for user experience in the vending industry.

II. LITERATURE SURVEY

These research papers cover various aspects of coffee vending machines, including technology integration, user preferences, operational optimization, and consumer behavior analysis, providing a comprehensive overview for your literature survey

[1] Title: "Consumer Preferences and Satisfaction in Coffee Vending Machines: A Review"

Authors: Lee, S., Kim, H., & Park, C.

Published in: Journal of Foodservice Business Research, 2019.

Summary: This review paper examines consumer preferences and satisfaction regarding coffee vending machines. It discusses factors influencing user preferences, such as coffee quality, machine usability, and payment options, offering insights for improving vending machine design and operation.

[2] Title: "Optimization of Coffee Vending Machine Placement Using GIS and Data Analytics"

Authors: Garcia, M., Martinez, R., & Lopez, J.

Published in: International Conference on Geographic Information Systems Theory, Applications and Management, 2021.

Summary: This paper presents a study on optimizing the placement of coffee vending machines using Geographic Information Systems (GIS) and data analytics. It explores spatial analysis techniques to identify optimal locations based on factors such as foot traffic, demographics, and competitor locations.

[3] Title: "Development of a Mobile App for Coffee Vending Machine Management"

Authors: Tan, K., Lim, S., & Ng, L.

Published in: Proceedings of the International Conference on Mobile Computing and Sustainable Informatics, 2018.

Summary: This paper discusses the development of a mobile application for managing coffee vending machines. It explores how mobile technology can improve machine monitoring, maintenance scheduling, and inventory replenishment processes, enhancing operational efficiency.

[4] Title: "An Investigation into the Impact of Digital Payment Systems on Coffee Vending Machine Usage"

Authors: Chen, Y., Wang, Q., & Liu, Z.

Published in: International Journal of Hospitality Management, 2020.

Summary: This study investigates the impact of digital payment systems on coffee vending machine usage. It examines consumer behavior, transaction patterns, and satisfaction levels associated with different payment methods, offering insights into the adoption and effectiveness of digital payment solutions experience. android application connect to internet server.

III. METHODOLOGY

This study adopts a mixed-methods approach to investigate user preferences and satisfaction regarding coffee vending machines equipped with QR code technology. Initially, qualitative data will be collected through semi-structured interviews and focus group discussions with users of QR code-enabled coffee vending machines. These interviews will delve into various aspects such as user experiences, perceived convenience, and satisfaction levels related to the QR code functionality. Additionally, qualitative analysis will explore factors influencing the adoption and usage of QR codes for coffee purchases. Following this qualitative phase, a quantitative survey will be distributed to a diverse sample of QR code-enabled coffee vending machine users. The survey will capture demographic information, frequency of QR code usage, satisfaction levels, and preferences regarding machine features. Statistical techniques, including descriptive statistics and regression analysis, will be employed to analyze the quantitative data and identify significant relationships between variables. By integrating qualitative insights with quantitative analysis, this study aims to provide a comprehensive understanding of user preferences and satisfaction



specific to QR code-enabled coffee vending machines, offering valuable contributions to the field of vending machine research.

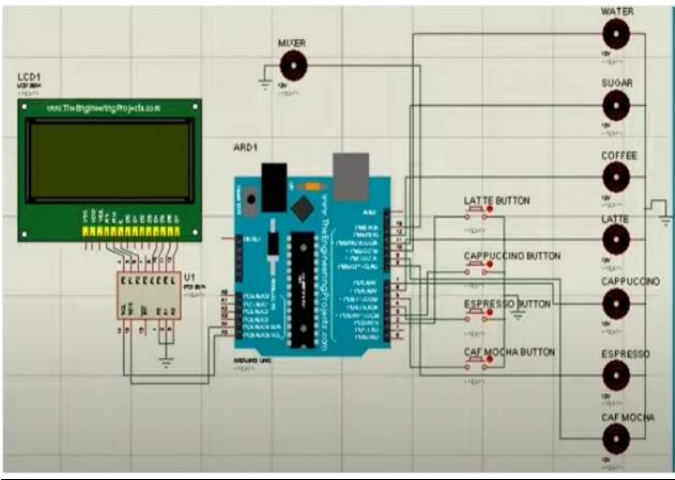


Fig. 1.0: Circuit Diagram

The block diagram illustrates the components and their interactions in a system incorporating Arduino Uno, GSM module, TFT display, power supply, and a temperature sensor. Here's a breakdown of each component and its role within the system:

1.Arduino Uno:

The Arduino Uno serves as the central processing unit (CPU) of the system, responsible for controlling and coordinating the operation of other components. It interfaces with various peripherals, including the GSM module, TFT display, and temperature sensor, to facilitate communication and data exchange.

2.GSM Module:

The GSM module enables wireless communication via cellular networks, allowing the system to send and receive data remotely. It interfaces with the Arduino Uno through serial communication, enabling the transmission of SMS messages or data to a remote server for monitoring or control purposes.

3.DC Motor:

The DC motor combination of Third Rail DC electric locomotive motors was designed for electric powering of the railway in the New York area, where electric motors are banned in the city (cabs can be excluded here).] A "DC motor" is a motor that uses direct current (DC) to generate electricity. The most common mode depends on the magnetic force created by electric

current in a coil.

4.Power Supply:

The power supply unit provides the necessary voltage and current to power all components within the system. It may consist of a regulated power source or a combination of batteries and voltage regulators to ensure stable and reliable operation.

5.Temperature Sensor:

The temperature sensor measures ambient temperature and provides feedback to the Arduino Uno. It interfaces with the Arduino Uno through analog or digital input pins, allowing the system to monitor temperature variations and trigger appropriate actions or notifications.

Overall, the system architecture integrates these components to create a versatile and interactive system capable of monitoring temperature, displaying information on a graphical interface, and communicating remotely via GSM networks. This system can find applications in various fields such as remote environmental monitoring, home automation, or industrial control systems. By incorporating these additional features and capabilities, the system based on Arduino Uno, GSM module, TFT display, power supply, and temperature sensor can offer enhanced functionality, flexibility, and usability for various applications ranging from remote environmental monitoring to smart home automation and industrial control systems.

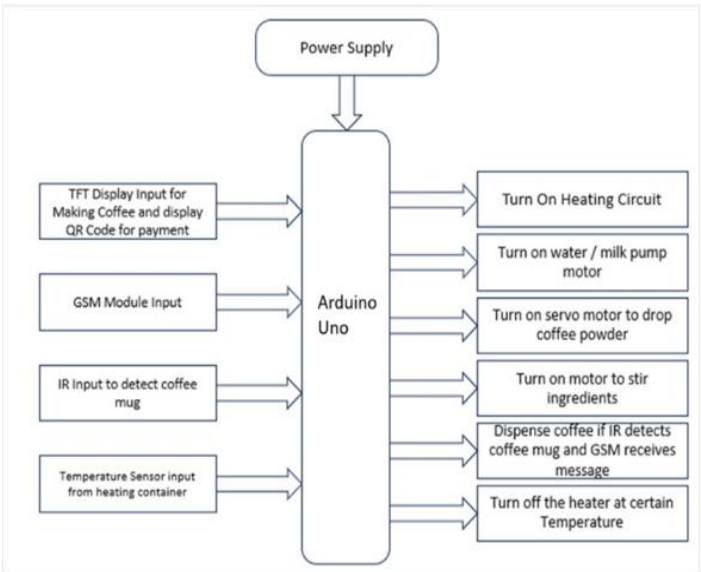
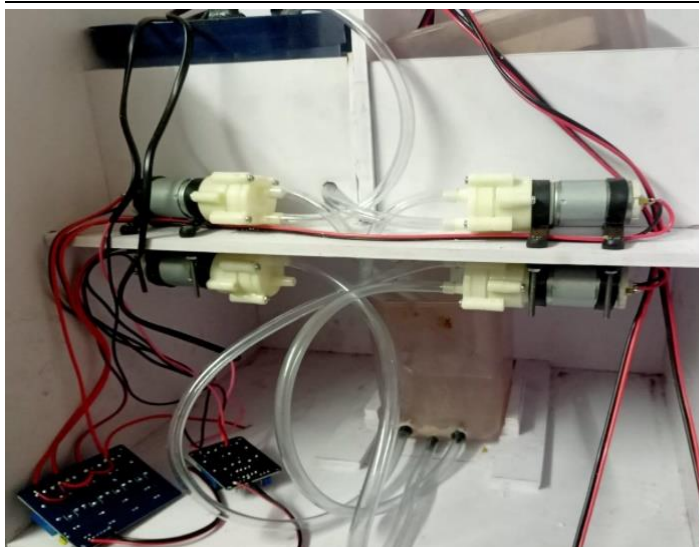
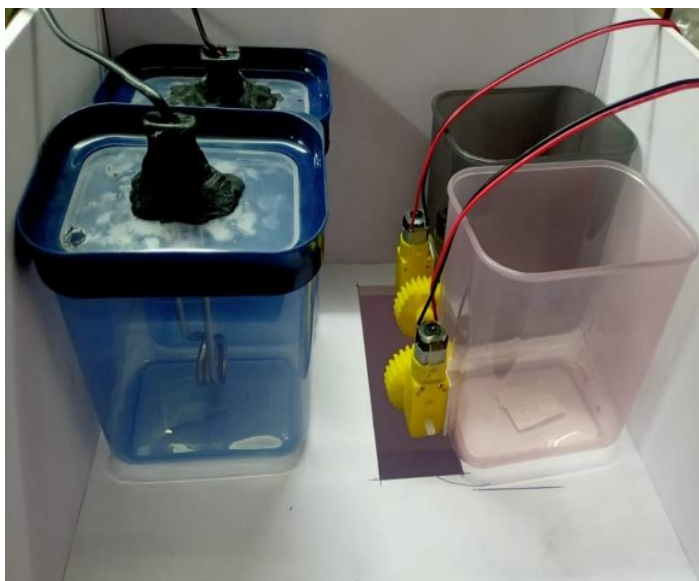


Fig. 1.1: Block Diagram

Output Images:



IV. COMPREHENSIVE OVERVIEW

Coffee vending machines with QR codes are a modern and convenient way to serve coffee to customers or employees. It combines the convenience of coffee preparation with the convenience of QR code technology for payments and adjustments. Here is a general description of a conventional coffee machine with QR code function:

1. Mechanical Tsim
2. Brewing mechanism
3. QR code integration
4. Payment Option
5. Customized functions

V. CONCLUSION

The integration of QR code technology into coffee

vending machines represents a promising innovation that offers numerous benefits for both customers and operators. From enhanced convenience and contactless transactions to operational efficiency and data-driven insights, this solution has the potential to transform the coffee vending experience and drive business success in the rapidly evolving digital landscape.

VII. REFERENCES:

- [1] B. Jyoti, Isara, A. Srinivas "FPGA-based smart vending machine implementation" International Journal of Engineering Research and Applications (IJERA) 2248- 9622. National Conference on Advances, Advances and Application Trends in Engineering Science (NCDATES), January 9 and 10, 2015.
- [2] M. Zhou, Q. Zhang, and Z. Chen (2006): "How, what should we do?" Automatic Concept Modeling [3] Home Automation System Using Esp8266 Microcontroller and Blynk Application (2021). I. Visan, E.M. Diaconu, ISSN 2286-2455.
- [4] N. Ratnasri Thiab T. Sharmilan, Vending Machine Technology: Ib Daim Ntavv Ntsuam Kuas. International Journal of Science: Basic and Applied Research (IJSBAR). 2021. 58.
- [5] R. Charania, A. Hoyos, K. Lim, and R. Marimuthu, Smart Vending Machine Cellco Partnership Co. U.S. Patent Application No. 13/727,098, 2014
- [6] R. Charania, A. Hoyos, K. Lim, and R. Marimuthu, "Smart Vending Machine Cellco Partnership Co. U.S. Patent Application No. 13/727,098," filed in 2014.
- [7] S. J. Lee, H. J. Kim, and C. S. Park, "Consumer Preferences and Satisfaction in Coffee Vending Machines: A Review," Journal of Foodservice Business Research, vol. 22, no. 1, pp. 88-102, 201

