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# Automated Checkout using QR code for Supermarkets

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**ABSTRACT**: This article details the creation and deployment of a cutting-edge automated checkout system for an Android grocery store app. The suggested solution streamlines the standard checkout procedure using QR code technology, giving customers a quicker and more convenient purchasing experience. Customers can use the app to scan the QR codes on their purchased items, which immediately creates an itemized statement and enables secure and quick payment transactions by utilizing the capabilities of modern smartphones. By increasing operational effectiveness and reducing employee workload, the system intends to decrease wait times and improve customer happiness, as well as provide advantages to supermarket owners.

**KEYWORDS***:* creation of QR codes for all products, you can add the things to your cart and subsequently check out by scanning the QR code to acquire information about each item.

## I. INTRODUCTION

A smartphone application makes groceries checkout simple and smart. The client is able to utilize a QR code to pay for the item by scanning it. Customers no longer need to wait in line for a very long time given how easy the task is made for them. Because there is no need to wait in a long line, this mobile application has the benefit of being easy to use and efficient in today's fast-paced world.On the other hand, two-dimensional matrix codes, frequently referred to as the QR Code (Quick Response Code), are an advancement over the Barcode Systems and can be used for a variety of industrial activities. A program that is called the QR-Code Reader may view and read the two-dimensional shapes information consisted of in the QR Code. Images, movies, cost, and numerous other kinds of information may all be stored in a QR code.

This project's goal is to suggest a Quick Response (QR) code-based real-time gather system for consumer items utilizing an Android smartphone.Encode and decipher information from a single QR code using special symbols using the multiplexing and multiplexing methods, and finally separate the data back into individual QR Code pattern that can be read by Android smartphones. The product must be placed in front of the QR Code scanner for it to read the QR code and save the data regarding the item to the cart.

Since groceries are so necessary in daily life and cannot be acquired from supermarkets, individuals in urban societyhaving hectic schedules and cannot afford to waste time on grocery shopping. For the urban population, we have come up with an idea where our programs will assist clients save time and make things simple for them, allowing them to go both electronically and in person touch and feel the desired items, pay their bills in full, and continue working. In turn, this will lessen the need for employees, provide the shopkeeper with a clear database, and improve the consumer in every other manner.

## II. LITERATURE REVIEW

### 2.1 Related Work:

The QR filtering process is used to safely get the information concealed within the QR code. The notion of OTP is also applied in the security of QR codes [1].

When a consumer scans a product, he or she will be able to see all of the product's features, including cost, color, size, shape, and uses, before adding it to their basket [2].

Ditch irrigation, terraced irrigation, drip irrigation, and sprinkler systems are some of the available ancient traditional approaches. Increased demand for increased agricultural output, poor performance, and limited water supply

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for agriculture characterize the worldwide irrigation scenario. When we employ a machine-driven irrigation system, these problems are frequently resolved [3].

They have proposed that which aids a person in everyday shopping by reducing the amount of time spent acquiring goods. The major objective is to provide a technology-based, cost-effective, easily expandable, and durable solution to help with in-person shopping [4-5].

n the existing system, Bar codes should be browsed victimization pc vision techniques and code will hold info, it makes this vision task in shopper situations is difficult. The code decoder will provide the vision algorithmic feedback, and develop a progressive strategy for the product. As per the existing system, we have to wait in the queue to pay this, which makes the customer spend more time in the queue that is the most time- consuming in this existing system. Thus, we have overcome this drawback in our project**.**

**2.2 Proposed System:**

The time required by the cashier scanning each item is decreased in the proposed strategy. For clients who don't have an Android phone, our proposed model offers an android application or a scanner. The purchaser himself scans the product's barcode prior to initiating a purchase.Either way the customer need not pick up the item physically.

The scanner or the application then calculates the total price of the all the selected items. The selected items are displayed on a monitor and are picked up by the staff members of the corresponding department in the supermarket. At the end of the billing process the selected items are delivered to the customer after the payment is made.

The customer shows the total price displayed on the scanner or the app to the cashier and pays the bill. We also provide an alternative for online shopping wherein the customer selects the item and makes the payment online. The customer can either request for home delivery (after a suitable range of price) or can go to the supermarket and pick it up. In our proposed “automated supermarket” system, each customer is given an interactive display and a barcode scanner which can be used to scan the items in case of confusion with brands, else items can be check listed from a list given on the gadget.

Once all items are scanned or chosen or both, the customer can proceed to the billing counter where the customer has to pay the bill and wait for 5-10 minutes for the products to be packed and brought to the customer to take away. The customer is notified about the completion of packaging of his items through a short text message to his cell phone [6].

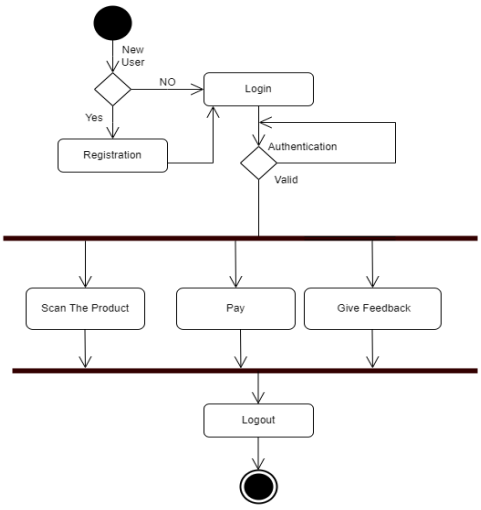


Fig 1. Activity Diagram

Step 1: Users have the option to either register or log in using their appropriate credentials. If they are not yet registered, they can create an account, and if they have already signed up, they can simply log in with their existing credentials.

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Step 2: In order to obtain product information, users have the convenience of scanning a product's QR code. By using their mobile devices, they can easily access relevant details about the item.

Step 3: Once the scanning process is complete, users can effortlessly add the desired items to their shopping cart. Furthermore, the app's integrated payment system allows users to swiftly and securely settle their bills.

Step 4: The app offers customers the opportunity to share their valuable feedback effortlessly. By using the app's dedicated feedback feature, users can express their opinions, suggestions, and experiences with ease.

Step 5: After completing their tasks or activities, users have the option to log out of the app. By accessing the app's settings or profile section, they can initiate the log-out process seamlessly, ensuring the security of their account and data.

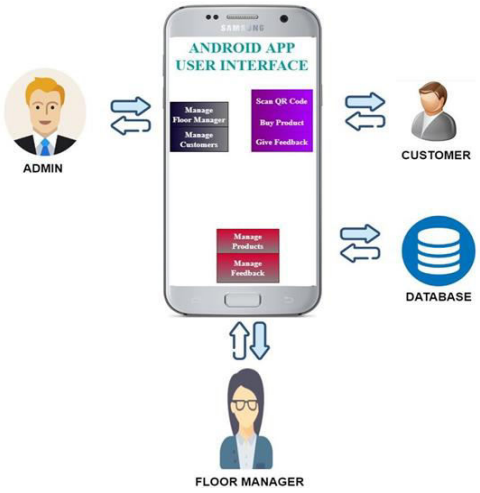


Fig 2. System Architecture

- **Admin:** All admin data is saved in this module. After logging in, the app admin may approve or decline those who have registered.
- **Floor Manager:** All floor manager data is contained in this module. After logging into the app, the floor manager can store commodities, view the client obligations, and verify products.
- **Customer:** All client data can be found in this module. Customer will scan, pay, and make use of the app right after they have logged in.
- **Database**: The database enables seamless data synchronization between the Admin, Floor Manager, and Customer components, ensuring that all parties have access to up-to-date and consistent information. It plays a critical role in supporting the automated purchase process, providing efficient and reliable data management for the supermarket application.

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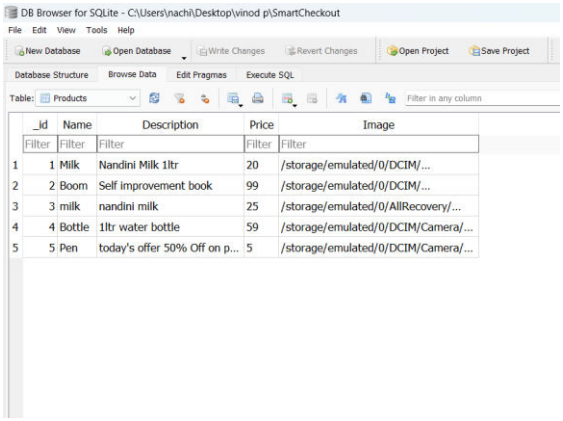
## III. RESULT AND DISCUSSUIONS




| | _id | Name | Description | Price | Image |
|---|---|---|---|---|---|
| | Filter | Filter | Filter | Filter | Filter |
| 1 | 1 | Milk | Nandini Milk 1ltr | 20 | /storage/emulated/0/DCIM/... |
| 2 | 2 | Boom | Self improvement book | 99 | /storage/emulated/0/DCIM/... |
| 3 | 3 | milk | nandini milk | 25 | /storage/emulated/0/AllRecovery/... |
| 4 | 4 | Bottle | 1ltr water bottle | 59 | /storage/emulated/0/DCIM/Camera/... |
| 5 | 5 | Pen | today's offer 50% Off on p... | 5 | /storage/emulated/0/DCIM/Camera/... |

Fig 3. Database

1. **ID**: In the context of databases, an ID (short for Identifier) represents a unique value that is used to identify a specific record or entity within a database table. The ID serves as a primary key, which means it uniquely identifies each row in the table.

2. **Name**: The "Name" column in the database contains the names of the products. This column is used to store the human-readable titles or labels that uniquely identify each product in the system. It allows users and applications to easily recognize and refer to different products stored in the database.

3. **Description**: The "Description" field in the database contains the product details. When a user scans the QR code, they will receive this description as valuable information. This descriptive text provides comprehensive insights into the product, including its features, specifications, and other relevant information.

4. **Price**: The "Price" attribute in the database denotes the monetary value assigned to the products. This field serves as an essential indicator of the cost associated with each item listed in the database. By storing the product prices in this attribute, the system can easily retrieve and display the accurate pricing information to users or customers.

5. **Image**: The "Image" attribute in the database contains the file path that points to the location of the picture associated with specific products. This attribute serves as a reference to the exact file location where the product's image is stored within the system. By utilizing the "Image" attribute with the file path information, the application can effectively retrieve and display the appropriate picture for each product when needed.

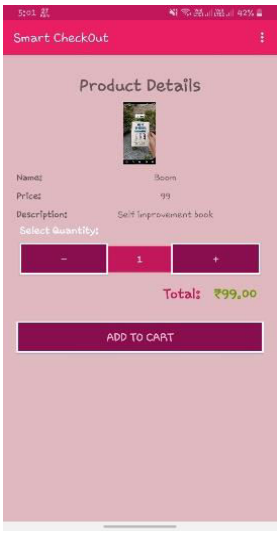



Fig 4. Product Details

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Upon scanning products, customers have the convenience of adding them to their virtual shopping carts effortlessly. The application allows users to view the contents of their cart at any time, making it easy to keep track of the selected items. Additionally, customers can freely make modifications to the cart, such as adding more products, adjusting quantities, or removing items as needed to tailor their shopping experience to perfection.

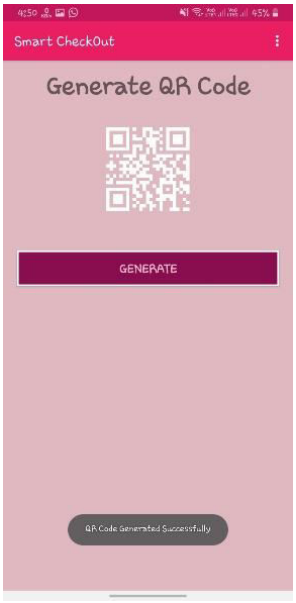


Fig 5. Product QR code

The Floor Manager takes charge of generating individualized QR codes for each product within the supermarket. With meticulous attention to detail, they ensure that these QR codes are accurately affixed to their respective items on the shelves. By implementing this careful approach to QR code management, the Floor Manager plays a crucial role in optimizing the automated and timesaving purchase process for supermarket customers.

## IV.LIMITATIONS

1. **Technology Adoption:** The success of the system heavily relies on customers' willingness to adopt new technology. Some customers, especially those less familiar with smartphones or QR codes, may find it challenging to use the application, potentially limiting its accessibility.

2. **Dependency on QR Codes:** The system heavily relies on the proper functioning of QR codes. If a QR code is damaged, missing, or cannot be scanned accurately due to poor lighting or camera issues, customers may face disruptions during their shopping experience.

3. **Internet Connectivity**: A stable internet connection is necessary for the application to function correctly. In areas with poor network coverage or during network outages, the system's reliability may be compromised, affecting real-time inventory updates and payment processing.

4. **Product Placement and Accuracy**: For the system to work seamlessly, QR codes must be placed accurately on products, and the backend database needs to be continuously updated with real-time inventory information. Failure to maintain accurate data can lead to incorrect product information and customer dissatisfaction.

5. **User Preference and Experience**: Some customers may prefer the traditional shopping experience, interacting with physical products and aisles. Automated purchasing may not appeal to all customer demographics.

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## V. FUTURE SCOPE AND IMPROVEMENTS

1. **Offline Mode Support:** Implementing an offline mode in the application would enable customers to continue shopping and adding items to their carts even when the internet connection is temporarily unavailable. The data would sync automatically once the connection is restored.

2. **Loyalty Programs and Rewards**: Introducing loyalty programs and rewards for frequent shoppers can encourage customer retention and foster brand loyalty. Customers could earn points or receive special discounts for using the application regularly.

3. **Expanded Payment Options**: Offering a wide range of payment options, including support for various digital wallets and cryptocurrency, would cater to the preferences of diverse customer groups and contribute to a seamless checkout process.

4. **Multi-Language Support**: Providing multi-language support in the application would enhance its accessibility to a broader audience, especially in regions with diverse linguistic backgrounds.

5. **Favorite or recently added item**:A new enhancement includes the ability to store favorite or recently added items, enabling users to swiftly add commonly purchased products to their cart.

## VI. CONCLUSION

As Smart phones become more and more popular in today's life, we are reducing efforts through smart devices and smart phones. With the help of barcode scanner and android application in smart phone customer can scan the items to be purchased and add product directly into the trolley. The different products purchased by the customer will be maintained in the application. The automatic bill gets generated after the shopping. The customer can pay bill by online [7].

Mobile technology is an integral component of our lives nowadays. It is utilized in many fields, namely communication, administration of accounts, industry, travel, etc. At the same time, numerous advances are made that make life easier for society and for mobile devices comparable, saving both time and cash. Among these developments is the QR code. One of the most common ways to encode and decode a lot of information is with a QR code. Since each client has his smart guide with him and doesn't need to wait or pay money to acquire a guide, the current investigation used it to develop an identification tag scheme that is used in indoor commercial institutions and replaces the guide.

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