

# Seamless Shopping using Quick Response (QR) Code

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## Abstract

Quite frequently, when shopping in a supermarket or grocery store, shoppers are discontented while searching the items from the shopping list and sometimes find no assistance is provided in the store. Contrarily, shippers also lose a substantial amount of sales as a result. In this paper, we are proposing a practicability study that influences the technology to make collections in the store "smart" in which it will recommend the recipe by scanning the items' quick response (QR) code through camera module and also provides the facility to user input. It also recommends the recipe for the item and the ingredients required to make the recipe. Further, it also provides the facility to customers to locate the place of the desired item. Thus, allowing the customers to locate the item and map them on the shop floor using raspberry pi. In addition to that, the system will provide the expense of the item as well as the total expense of the scanned item. A Smart system has been developed to exhibit the promise of this exploratory work. The frequent analysis could edge to the entire revolution in our everyday shopping experience.

## 1. INTRODUCTION

Today, the world is advancing using distinct technologies. Technology is put to use in looking forward to the everyday concern of the common man. In this core, we represent a smart cart system. Here the proposed system recommends the recipes based upon the item detected by the system. This framework abodes to one of the common difficulties that the customers face in the actual system, such as not able to locate the items or the elements in the store or employee for any help. A store is a place where clients come to purchase their daily essentials and pay for that. When people go to the store for shopping, they have to work for a selected product. Here the system will assist the customers in locating the product at the correct stock by giving to the user to find the desired product and to locate the place of the item in the store thereafter adding new knowledge to the customers.

Seamless shopping can be used in supermarkets to enhance the shopping experience of the user. The customer can activate the system and hence avoid the hassle of pulling for searching the location of the item they desire by following the route shown by the system. Customers contribute abundant scope of energy to determine the product they desire. Therefore the clients do not find the item or the staff member to assist them; it is more apparent that they can leave the store with no buy, and that is thought to be a bizarre disappointment to the dealer. Here the customer needs not to have to prick their heads to know item location.

## 2. LITERATURE SURVEY

The internet of things (IoT) based seamless shopping is the system that operates based on the user input and locates the item. The IoT is a worldwide information network that involves various objects connected to the internet, which involves sensors and actuators, radio frequency identification systems that are becoming an essential component of the internet.[1]

According to this paper, it proposes that in the actual world, some systems involve consumer supplies using QR code in smartphones. Here they are developing an android application for smart shopping; the application here involves the use of the process of multiplexing and demultiplexing just to encode and decode single QR code. The QR code authenticates the code with the help of a smartphone then sends it to the server for authentication after the QR code has been decoded by smartphone. Then, the list of products is forwarded to the server by the customer to make a decision on authenticity. The proposed paper is about a product that was developed for a shopping mall, which guides the customer to the product where it is located this help to save time.[2]

The intelligent technology, that is, IoT, joins all the sensing devices to the internet. The communication takes place with the help of the agreed protocol. The goal is achieved in locating, tracking, monitoring, and managing things. [3] It is predicted that by 2020 there will be 21-212 billion users. [4,5] About 45% of internet traffic by 2022 will link itself to IoT. [5]

The IoT application for marketing is one of the important concepts. The IoT can supply the appropriate information based on the input in which users enter. [6] The sensors are integrated into smartphones because this helps to track the location with the help of GPS. [6]

**2.1. Existing System**

The IoT based application is developed; here, they have made use of radio frequency identification (RFID) joined with the shopping cart. As all the shopping trolleys in the mall have RFID tags installed. Here RFID is installed in all the carts, the information about the cost is updated just by reading the details of that product. Smart shelves are integrated by RFID readers. So, this helps to improve stock maintenance by maintaining an inventory list. In addition to this, an LED display is also installed just to display the details of the product in the cart as well as the overall price of the item. A mobile point of sale is there in the cart, which helps the user to make the payment instead of waiting in the long queue. All these details is stored in the database.[7]

**2.1.1. Working of the Existing System**

The technique naturally inquires for a client based on RFID. In shopping centers or grocery stores, the items are provided with cutting edge RFID labels instead of bar-codes. The diverse trolleys grasp the setup, which incorporates a cutting edge RFID peruser, infrared sensor, entryway with engine, transfer, typical GSM module, driven, LCD, information input gadget, and an electrical switch. LCD show, shows the points of interest of accessible items in that cart and the by and high cost of all the items. [4] Door with engine, transfer, typical GSM module, driven, LCD, information input gadget, and an electrical switch. LCD show, shows the subtle elements of accessible items in that cart and then the general cost of all the items. [8]

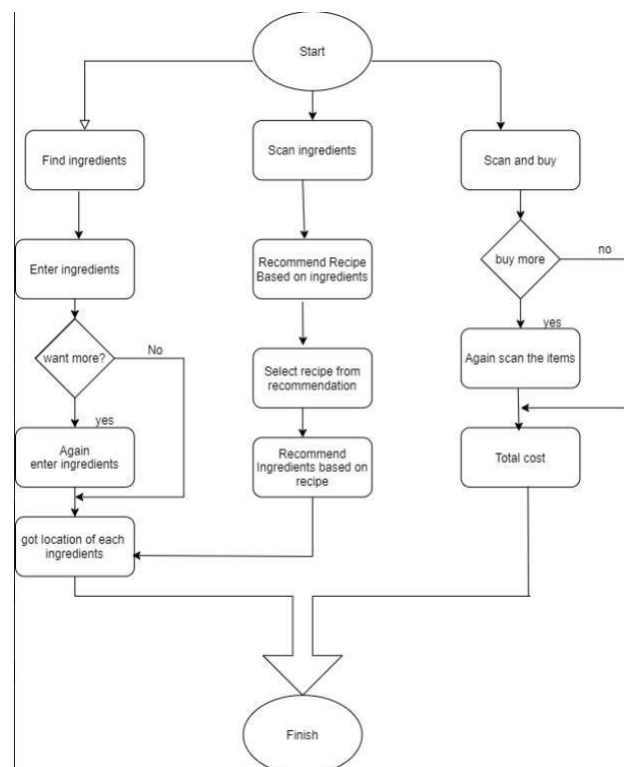
**2.2. Current Limitations**

- This model requires the basic installation cost over all the carts present in the supermarkets.
- Our system does not provide information about the freshness of the item.
- It may be a bit costly for the customer because of a few of the recommendations made by the system, which are not necessarily very important for the customer.
- It mainly uses the standard recipe as a reference.

**3. PROPOSED SYSTEM**

The most objective of the proposed framework is to supply an innovation situated, and a shopping cart is built to improve the overall shopping encounter. Upon setting a thing within the shopping cart, the buyer can get formula suggestions. In the event that a customer isn't beyond any

doubt of the area of an item, they will be able to find the put of the thing. A grocery store could be a place where customers come to purchase their day by day, utilizing items and pay for that. When we go to the general store for shopping, we ought to work to select the proper item. Too, after that, it is hectic to stand in line. Hence, we are proposing to create a keen shopping cart framework that will identify the thing by filtering the QR code as well as permit client to input the thing which is desired; it will prescribe the formulas to the checked QR code for the thing or by the client input and can explore to the put where shopping thing is accessible and the data of the fixings required to create the recipe. Of the location of an item, they will be able to locate the place of the item. A supermarket is a place where shoppers come to purchase their daily using products and pay for that. When we go to the supermarket for shopping, we have to work to select the right product. Also, after that, it is hectic to stand in line. Hence, we are proposing to develop a smart shopping cart system that will detect the item by scanning the QR code as well as allow the user to input the item which is desired, it will recommend the recipes to the scanned QR code for the item or by the user input and can navigate to the place where shopping item is available and the information of the ingredients required to make the recipe.



**Fig.1:** Proposed block diagram

### 3.1. Working

Our system is developed with the help of raspberry pi, micro-sd card with a Raspbian on it, camera module for QR code scanning purpose. The system is developed in python language. The purpose of the following is stated below:

- Raspberry pi: The system code is written in the Raspberry pi.
- Camera module: The camera module is used for scanning the QR code of the item desired by the customer.
- QR code: For the QR code reader zbar light python library and fswebcam are used to take the picture.

The framework gives the client to input the thing which is wanted, or it can foresee the thing by filtering the QR code of the item. Recipes will be prescribed to the checked things, and the area of the thing will be given to the customer. Also, the framework will give the taken a toll of the thing as well as the whole taken a toll of the thing.

## 4. PROPOSED METHODOLOGY

The IoT based seamless shopping is developed for providing smart shopping experience to the customers. This project is developed using raspberry pi, a camera module for scanning the items QR code for predicting the item user can also enter the item that is required. The spiral methodology workflow is given as below:

### 4.1. Unit Testing

Unit testing target is the affirmation effort on the smallest unit of computer program arrange, the computer program component, or module. The unit test is white-box orchestrated. By giving alter human input to the system, the data are put absent in the database and recouped. In case you would like the needed module to induce input or gets the abdicate from the Conclusion client, any botch will be collected the time will provide a handler to seem what sort of botch will be collected. Unit testing targets to start with on the modules, free of one another, to discover botches. This enables the analyzer to recognize botches in coding and reliable botches that contained interior the module alone.

### 4.2. Integration Testing

Integration testing might be a viable strategy for creating the program structure, though at the same time, to uncover the mistakes related to interfere. The objective is to require the unit-tested module and build a program structure that has been recognized by arranging. It additionally tests to find the refinement between the system and its unique targets. Subordinate stubs are supplanted one at a time inside the veritable appear. Tests were conducted at each module, which was integrated, recognized by planning. It moreover tests to discover the distinction between the framework and

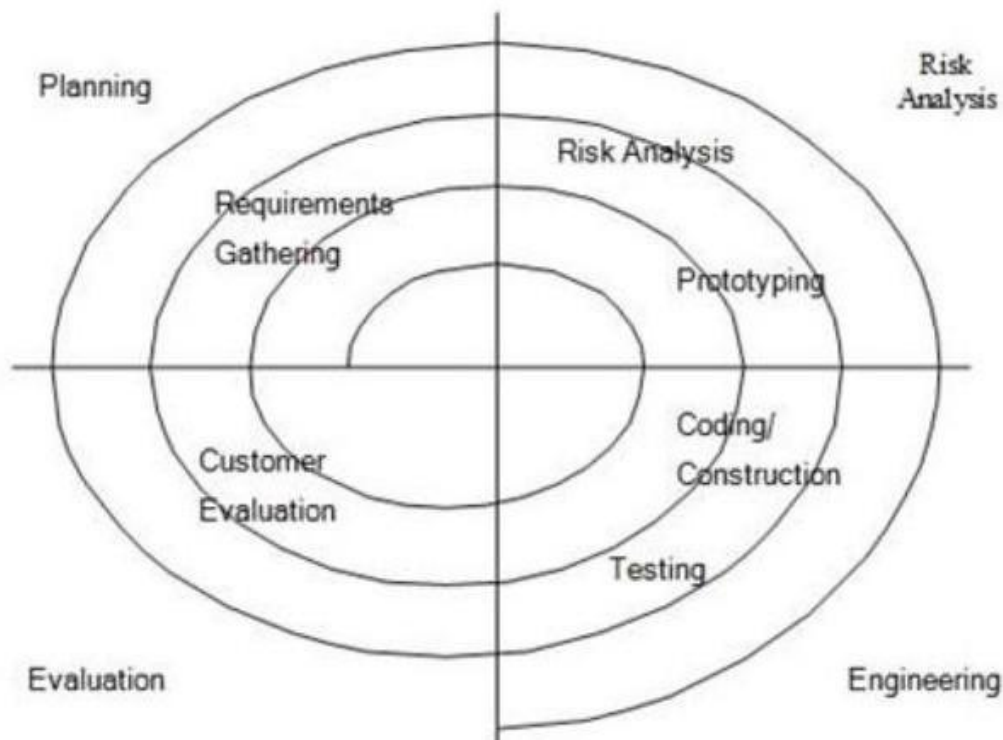


Fig.2: Spiral methodology workflow diagram

its original targets. Subordinate stubs are supplanted one at a time within the genuine show. Tests were conducted at each module, which was integrated.

### 4.3. Functional Testing

Functional testing is a technique in which all the functionalities of the program are tested to check whether all the functions that were proposed during the planning phase are fulfilled. This is also to analyze that if all the functions proposed are working properly. This is further done in two phases:

- One before the integration to see if all the unit components work properly.
- Second to see if they still work properly after they have been integrated, to check if some functional compatibility issues arise.

## 5. RESULT AND ANALYSIS

### 5.1. Sample Screenshots

shows the item detection by scanning the QR code using the camera module attached with raspberry pi.



Figure 3 and 4: The system scans the QR code of the item using the camera module and detects the item.



Figure 5 and 6 : shows the recipe recommendation for the detected item.



Figure 7 and 8 : If the user wants to know the exact location of the item, the user needs to scan the items QR code. The system will detect that particular item, and based on that, it will search the item location in the shopping market and the ingredients required to make the recipe, as shown in the Fig.4 & 6 .The item scanned is potato, it will search for its location, and the ingredients required to make the recipe.



Figure 9 and 10 : Likewise, for cabbage as well, it will search the item place based on the predicted item.

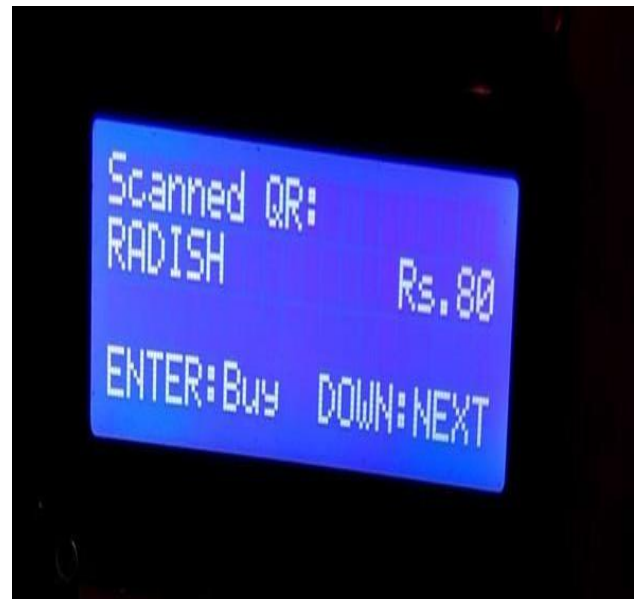


Figure 11 and 12 : Further, the system provides the option to scan the item and get the cost of the scanned item as well as the total cost of the item. As shown in Fig., it scans the QR code and provides the cost of the item.

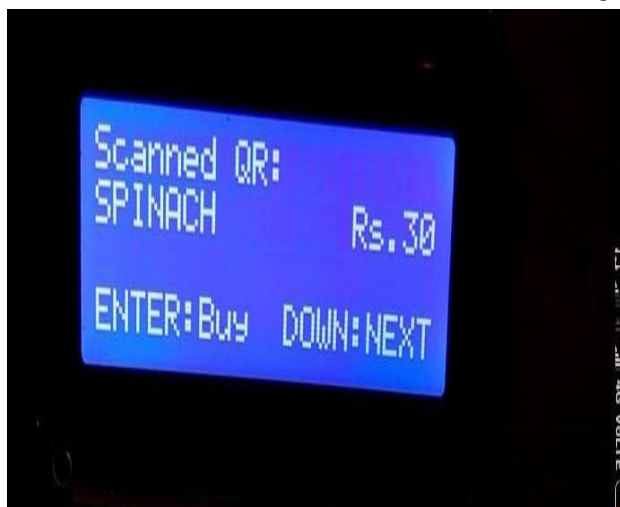


Figure 13 and 14 : Likewise, for radish, it scans and provides the cost of it; also, the system provides the total cost of the item as shown below.

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## 7. 7. CONCLUSION

Formula suggestion may be an exceptionally critical space both for individuals and for society. Looking at the thing within the store is accomplished utilizing this framework. The work that has been done to date, it appears that indeed in spite of the fact that the user's taste prediction for nourishment can be accomplished with extant frameworks or the methods. The innovations like Web of Things joins different things in association and is an accomplishment in today's dexterous world. The consistent shopping framework gives all the office of the client to input as well by checking the QR code of the thing in this way, upgrading the shopping involvement for the client, and empowering clients to shop efficiently.

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