E-Shopping Cart Android Application for Shopping Malls

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Abstract: Nowadays everyone uses mobile devises, as people are able to use internet everywhere. Many enterprises uses mobile applications to attract mobile users. In traditional shopping in shopping malls we have to wait in the long queue to make payment. The proposed application can read the barcode(s) of the product(s) & add it to the shopping cart in the application. It provides module to change the quantity of product/s purchased and edit the list. Payment can be according to customer convenience. After adding the products to the list and after doing the shopping the application will generate the QR-code for the purchase. After that the QR-Code can be scanned at billing counter and the bill will be generated. The proposed application can reduce human efforts and can be used very easily while shopping in malls.

1. Introduction

From past 2 decades, use of mobile devices has greatly increased, that has led to ease of carrying out day to day activities. Current mobile phones implement various new kinds of applications such as taking photos, and video recording by using embedded camera devices, and this progress also depends on the camera device technology [6]. Using this technology we can implement various other problem solutions for a better day-to-day experience. So, the majority of mobile phones, with camera devices support symbol recognition, such as EAN barcode [5] and QR-code (2D barcode) [6], and these code symbols are used for easily accessing the phone provided network services by reading URLs or such address characters. This technology can be used to improve the shopping experience for users. In this system, we are designing a mobile phone application for shopping purposes with various advantages over the traditional shopping system and process.

2. Background

In traditional shopping, the customer goes through a considerably time consuming process to complete the shopping, billing and payment methods. The customer has to choose the desired products, go through the billing process at the billing counter, payment methods and then checkout. So the customer has to wait in long queue for traditional billing system and it is very time consuming. In traditional system the user has to visit shopping mall, then user can add product to shopping cart manually, the after shopping is done user has to wait in long queue for the traditional billing system. At billing counter the counter person will scan barcode of every product and add it to computer bill, then user pays bill as convenience, then at security counter the security person will check every product with bill, then user can check out.

3. Existing System

Design of Smart Shopping Application Using Barcode Scanning and Location Based Coupon Service - in this system the customer visits offline store then scans product’s barcode with his/her smartphone. Some coupons will be sent to customer’s smartphone while shopping. Smart shopping application will gather product information and provide a list of the product automatically from database. Customer can whether use coupon or keep the products in mobile shopping cart and pay for them through online.
Mall Shopping System Using NFC – In this system, every Product is attached with a NFC Tag. These NFC tags hold a unique number. These tags are scanned via Android Smart Phone (NFC reader/writer). Then the smartphone sends the unique NFC tag ID to the Server which we are using a Tomcat server. The server holds all the information regarding the products and offers costing. The smartphone and server communicate with each other through a TCP/IP network. Above shows the system architecture diagram [3].

Smart Shopping - An Android Based Shopping Application - In this system, the user will scan the item which he wants to purchase with the help of scanner provided by this app. After scanning of the item a web service will get called which will create a connection with the database of the shop. As the connection is established, the user is now synchronized with the database and information related to that item is provided to him. In this whole procedure the overall time of scanning of individual items is saved and thus reducing the time of the shopping.

4. Literature Review

In these sections we are going to discuss about the papers that we have studied and will also mention the authors and their techniques or methods that they have used in their paper.

“Sanga Son, Yongtae Shin” has published a paper on the topic "Design of Smart Shopping Application Using Barcode Scanning and Location Based Coupon Service" in 2015 8th International Conference on Grid and Distributed Computing. The authors have developed an android application which works with internet and uses location-based service to provide location-based coupons for the mall. This paper aims to the online and offline shopping. The authors had developed an android application which can scan barcode of product and add it to the cart. After that the user has to pay the bill online only. The Authors also added location based coupon service for the customer.

“O. Wenxing, W. Lei, J. Zhipeng, and Y. Changhong” has published a paper on the topic “Implementation of Smart Shopping System based on NFC Technology” in 2015 Seventh International Conference on Measuring Technology and...
Mechatronics Automation. This paper aims to the pre-ordering system of the product from various malls. The author also using NFC technology for online payment.

“Adarsh Borkar, Madhura Ansingkar, Monali Khobragade, Pooja Nashikkar, Arti Raut” has published a paper on the topic “Smart Shopping- An Android Based Shopping Application” in 2015 International Journal of Advanced Research in Computer Engineering & Technology. In this paper the author has developed a system for malls. In this system every customer will have an UID and the mall should have a Wi-Fi enables services for the customer. The customer will connect to the shopping mall Wi-Fi then the offers of malls can be synchronised with user device. The user can made payment as users convenient.

“Mr. Jayesh B Mahajan, Mr. Bhagwat Kakde, Mr. Anurag Rishishwar” has published a paper on the topic “Mall Shopping System Using NFC” in 2015 International Journal of Scientific and Research Publications. This paper is fully depend on NFC technology. In this paper the author have attached NFC tag to every product, so the customer just have to tap the product to the smartphone and the product will be added in shopping cart.

“Eisaku Ohbuchi, Hiroshi Hanaizumi, Lim Ah Hock” has published a paper on the topic “Barcode Readers using the Camera Device in Mobile Phones” in 2011 International Conference on Cyberworlds.

The author has developed an algorithm which can read a 1-diamentional Barcode. The EAN barcode is a simple code which has four width types for black and white bars, and these line directions are always located in parallel.

This algorithm consists of the following phases

• Pre-processing - The input image from the embedded camera is pre-processed in this phase to define the threshold of the boundary between black and white intensity level, and the color space of the captured image consists of the YUV components, so we picked the Y component for this image processing.

• A black bar detection - The pre-processed image is scanned using a spiral searching method, which scans in spiral from the center of the image, to find a black bar.

• Sampling - The line perpendicular to black bars is calculated using the detected black bar in the previous phase, and the bar patterns are sampled based on the calculated direction.

“Phaisarn Sutheebanjard, Wichian Premchaiswadi” has published a paper on the topic “QR-Code Generator” in 2010 Eighth International Conference on ICT and Knowledge Engineering. The author developed an algorithm to generate QR-code. The QR-code is 2-dimensional code which can store or encrypt small amount of data. The author has developed a drupel algorithm to generate QR-code.

**Table 1. Literature Review**

<table>
<thead>
<tr>
<th>SR No</th>
<th>Paper Name</th>
<th>Publish Year</th>
<th>Author</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Design of Smart Shopping Application Using Barcode Scanning and Location Based Coupon Service</td>
<td>2015</td>
<td>Sanga Son, Yongtae Shin</td>
<td>This paper aims to the online and offline shopping application which can scan barcode of the product and make payment online</td>
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<td>3</td>
<td>Smart Shopping- An Android Based Shopping Application</td>
<td>2015</td>
<td>Adarsh Borkar, Madhura Ansingkar, Monali Khobragade, Pooja Nashikkar, Arti Raut</td>
<td>In this paper there is UID for every customer, the mall should have Wi-Fi for this approach.</td>
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<td>4</td>
<td>Mall Shopping System Using NFC</td>
<td>2015</td>
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<td>In this paper the mall products are attached with the NFC tag which will transfer the info to mobile application.</td>
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<td>5</td>
<td>Barcode Readers using the Camera Device in Mobile Phones</td>
<td>2010</td>
<td>Eisaku Ohbuchi, Hiroshi Hanaizumi, Lim Ah Hock</td>
<td>This paper aims to scan the EAN 1D barcode using image processing and decode it using spiral scanning method.</td>
</tr>
<tr>
<td>6</td>
<td>QR-Code Generator</td>
<td>2004</td>
<td>Phaisarn Sutheebanjard, Wichian Premchaiswadi</td>
<td>This paper aims to generate the QR-Code using drupal algorithm.</td>
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5. Proposed System

We have an efficient solution for the traditional billing system. The application mentioned here would read the barcodes of the products using smart phone camera & add it to the shopping cart in the application. The application uses “Spiral Scanning Method” to decode the scanned barcode. The decoded barcode would return the Universal Product Code (UPC). Using the UPC the application will return name, price of the product. The application provides methods to change the quantity of product/s purchased and edit the list. Payment can be according to customer convenience. The customer can use payment methods at billing counter. After adding the products to the list and after doing the shopping the customer has to submit full shopping list by clicking submit button. After submitting the list the application will generate the QR-code for the purchase. The QR-code contains whole list of product code and quantity of the product. The application uses “Drupal Algorithm” to generate QR-code. The QR-Code can be scanned at billing counter and the bill will be generated. The QR-code scanner is already available in mall billing counter. Using this system, we can minimize time consumption, avoid long queues and promote digitalization. The barcode and QR-Code scanner which generated the bill digitally decreases the process overhead needed for the traditional method for the same. Android application provided serves a user friendly interface to the customer to choose his/hers desired product.

6. Advantages

- Reduces queue in Malls
- Personally check the item
- Maintain history of purchased products

7. Conclusion

Smart phones that have become an important part of today’s life, so the smart phones have reduced all the efforts that are required for shopping. With camera feature in latest smartphones, the user can scan the barcode of the item to be purchased and then directly add it into the cart. There is no need of internet connection to do shopping because after completion of shopping the application will generate the QR-Code which can be scanned at billing counter and user can make payment as per the billing amount. So the defines system can be efficiently used to reduce human efforts and time.

8. References


