One-Q-Shop: An Android app for a queueless shopping experience.

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Abstract—The conventional shopping process is very time-consuming and cumbersome for the sick, the elderly and families with toddlers. Online shopping businesses easily gather data about user behavior, choices and opinion. There is no such facility for retail or wholesale stores. Large workforce is required to manage stores and inventories. Long queues and crowded stores may drive away customers. Therefore, a shopping assistant application would be useful in creating a better shopping experience for customers while increasing profits for the stores. The proposed solution is cheaper to implement as well as faster than handheld scanners, which have been in use in shopping avenues and malls. With the advent of the COVID19, it has become extremely unsafe to be in crowded places whether it is a shopping avenue or even a queue.This project aims at developing an android based M-commerce application that would help improve the conventional shopping experience by trying to eradicate the billing queue completely while helping businesses to increase their customer base and revenue. The aim of this paper is to act as a detailed guide for all to develop a system on similar guideline.

Index Terms—Mobile Computing, Android application, shopping, Automated billing, Shopping.

I. INTRODUCTION

Nowadays shopping malls and avenues are usually filled with long queues at the billing desk, resulting in wastage of time for customers. Malls are infamous to be overly crowded during weekends which makes customers choose to look for other options, thus hampering the business of malls. Through this application we aim to rectify this problem to minimize wastage of time and enhance customer experience. Shopping malls and avenues are popular places for weekly shopping trips for families. They are becoming increasingly crowded - there are long queues at the checkouts. Thus, such a conventional shopping process is very time-consuming and cumbersome for sick, elderly and families with toddlers.

Online shopping businesses easily gather data about user behavior. choices and opinion. There is no such facility for retail or wholesale stores. Large workforce is required to manage stores and inventories. Long queues and crowded stores may drive away customers. Therefore, in-store analytics for better understanding of customer behavior, insights will be useful for creating better shopping experience and increasing profits thereby. The proposed solution is cheaper to implement than handheld scanners, which have been used in shopping malls and avenues and wholesale stores. The ultimate aim is to completely eradicate the waiting queue for billing in a given supermarket whilst also keeping up the conventional pattern of shopping.. We aim to provide efficient and safe payment options to the customer thus saving them a lot of time and hassle.

An android application that allows registered users to scan the products they want at the time of placing them in the shopping cart and pay via our application that offers cashless, hasslefree, secure payments. This application also provides recommendations based on selected products and past history of current/other users below it. In our proposed system each product has a barcode on it. When a customer wants to buy a product he/she shall scan the barcode attached to that product to add it to the cart. In similar manners, deletion of products from the cart can also be done. Upon payment, an e-bill shall be given to the customer along with an option to opt for home delivery of the products or a scheduled pickup.

II. LITERATURE REVIEW

In [1], the recommender system generates recommendations based on user preferences and the content viewed by the user.

The algorithm doesn't check for the recommendation based on ratings given. In [2], an aspect ranking method was used which identifies the key aspects of a product from customer reviews. This Framework encloses four main constituents, i.e., Aspects extractor, Aspect grouping, Sentiment score prediction and Aspects ranking based on aspect dictionary and opinion. However the algorithm doesn't focus on given ratings and views. In [3], collaborative filtering is implemented to produce personal recommendation and item-based recommendation. Users can only state whether they like the item-based recommendation or not. But the personal recommendation is only preferred by the user who already did some activities: rate or view an item. However, the feedback taken from users for item-based is only used to improve item-based recommendation, whereas personal recommendation is not improved with users' feedback from item-based recommendations.

III. PROPOSED METHODOLOGY

This systems aims to develop an Android Application that provides shopping assistance to customers in shopping malls and avenues by automating the billing process using bar-code and providing budgeting facility as well as give recommendations to users based on their shopping patterns. The proposed technology can be used in shopping malls, super markets, retail stores, and wholesale stores. The customer gets recommendations based on current users/other users shopping patterns. The user also has the option to pay through the inbuilt payment gateway if they do not want to waste time at the checkout queues.
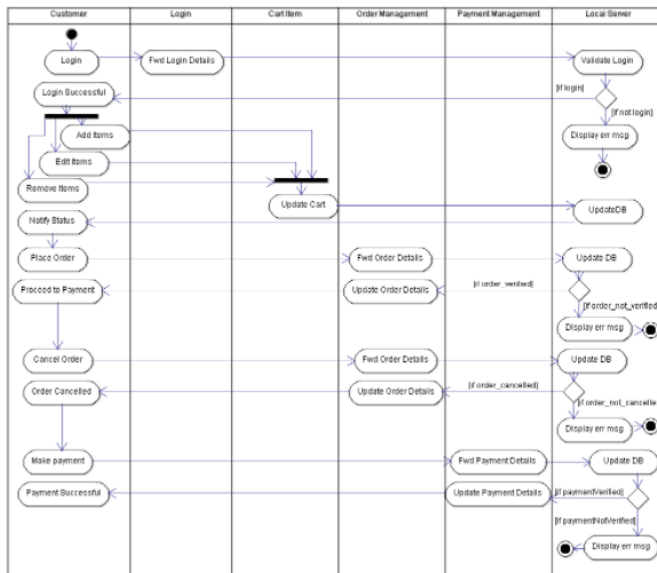

Fig. 1. Usecase diagram for the process model.

We can enhance the application further by adding new products and updating the existing products information depending upon market scenario in the applications database.

We can also add features like offers such as discounts tailored to the user based on their purchasing history. This history is saved in the database that can be accessed by the user.

The user will download the application and install it on their Android devices. Users will search or scan the product barcode and details of the product will be provided. Below the scanned product details, recommendations will be provided to the user based on the number of buys, ratings, number of views and reviews provided by the current user or other users. Users can also provide feedback if they like the recommendation or not. If the User clicks on the product and buys it will also be recorded as a feedback for the recommendation system. The proposed algorithm used in this project is a combination of Collaborative, Content-based and Sentiment score based recommendation systems. Based on viewing, rating, total buys and reviews data, recommendations are generated. Users will provide feedback if they like the recommendation or not. Based on the feedback recommendation system will be improved.

A. User panel

1. User can scroll through the main page and select a product.
2. User can select any product finds intriguing and see its details.
3. User can also search for products by going through the different categories avaialable in the catalogue.
4. User can select a product and add it to the cart by searching in the app.
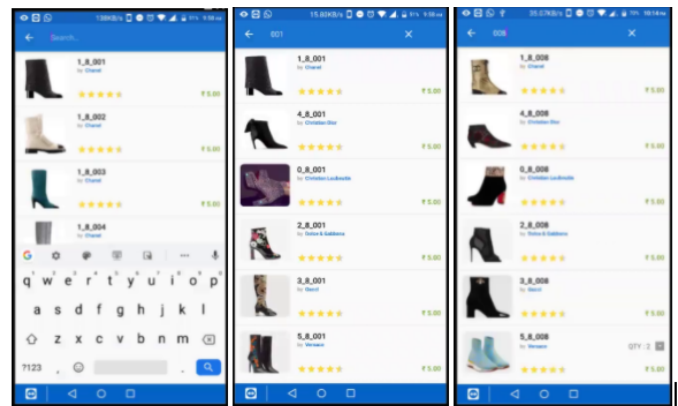

Fig. 2. User searches a product.

5. User can skip searching and directly scan the barcode or QR code present on the tag of the item he/she wants to buy.
6. Upon scanning, user can add the product to the cart, before which the prediction system shall display different other products similar to the product he/she has scanned to add directly to the cart.
7. User can change his/her account details like address etc leading to the checkout.
8. User can add or remove items from his/her shopping cart.
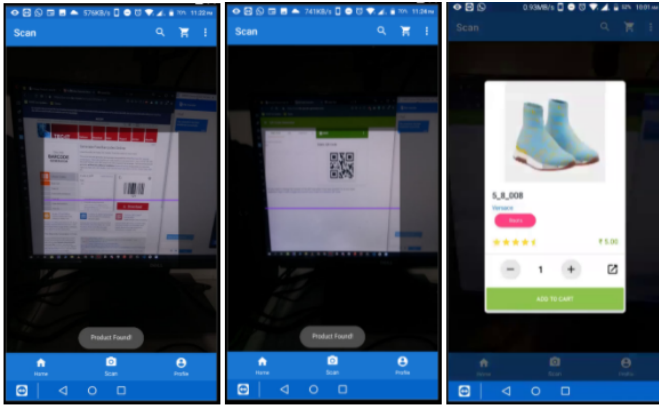9. To checkout user can choose their mode of payment i.e

Fig. 3. User scans the barcode/QR code of a product.

Credit card, Debit card or UPI.

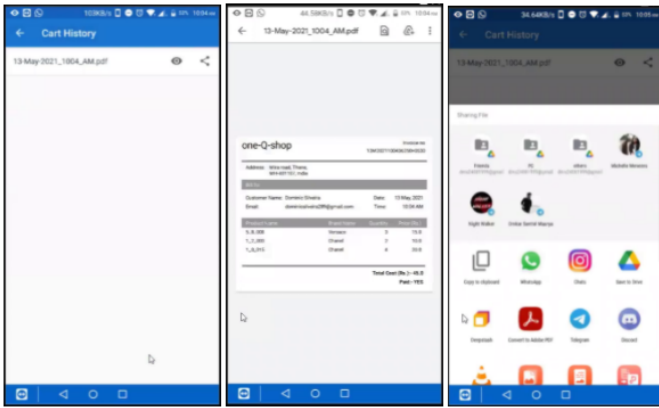10. Upon payment users, shall recieve an invoice which can

Fig. 4. Invoice upon checkout.

be shared and also printed.

11. User will get notifications on their device whenever there is an offer or on a special occasion.

B. Server Side

The data transfer is controlled by a centralized server which is located at the store center. The application created is a client-server-based system with the client being an Android application installed on the user's Android phone and the server is implemented in Django. It is a high-level Python Web framework that encourages rapid development and clean, pragmatic design. Built by experienced developers, it takes care of much of the hassle of Web development, so you can focus on writing your app without needing to reinvent the wheel. It's free and open source.

IV. LIMITATIONS

The limitations of our approach are as follows:

1.Seamless internet connectivity.

2. Database management.

3. Cloud storage.

4. Lag/Delay in updation and deletion of data.

5. Payment Gateway failures.

V. CONCLUSION

One-Q-Shop aims at facilitating the shopping process while not hampering the customer's shopping experience. The project automates the conventional shopping process and helps eradicate the long queues one usually encounters in a shopping scenario. The process of scanning a barcode or QR code and adding it to the cart for payment is not as much of a rarity, making it even more easier for the customers to get accustomed to. Barcodes are easily available and exist across all products, which hence does not incur any extra cost that would have been incurred for any other systems to have been implemented. Predictions made by the recommendation system helps customers get similar and related products without having to manually search for them. Cashless payments help in stopping the spread of any virus or diseases spreading through touch and hence in such critical times, the project ensures the safety of customers as every store would aim to. All-inclusive, One-Q-Shop helps provide a safe, fast, easy yet the same old shopping experience in a post-pandemic world to each and every customer in their shopping journey.

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