



INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X

Impact factor: 4.295

(Volume 5, Issue 2)

Available online at: www.ijariit.com

D2D Smart Billing System

Pushkar P. Saraf

pushkars919@gmail.com

D. Y. Patil College of Engineering
and Technology, Kolhapur,
Maharashtra

Arati D. Khanolkar

khanolkararati@gmail.com

D. Y. Patil College of Engineering
and Technology, Kolhapur,
Maharashtra

Akshada S. Pawar

akshadapawar26297@gmail.com

D. Y. Patil College of Engineering
and Technology, Kolhapur,
Maharashtra

Uddhav B. Ghodake

uddhavghodake45@gmail.com

D. Y. Patil College of Engineering
and Technology, Kolhapur,
Maharashtra

Snehal J. Salokhe

snehalsalokhe8@gmail.com

D. Y. Patil College of Engineering
and Technology, Kolhapur,
Maharashtra

Dr. G. A. Patil

gasunikita@yahoo.com

D. Y. Patil College of Engineering
and Technology, Kolhapur,
Maharashtra

ABSTRACT

“D2D (Day to Day) Smart Billing System” is developed that abets a person in everyday shopping in malls involving some automation in customarily practiced process. Malls and supermarkets are self-service shops offering a wide variety of food and household products. This system helps the customer in everyday shopping by minimizing the time required and increase shop productivity. The main objective is to provide a robust techno-savvy trolley with low-cost, high efficiency and easily adaptable system. Each techno-trolley is set up with a Raspberry Pi that is a unique identification device for that trolley. The camera scanner on the trolley will scan the purchased product and display it on LCD that is interfaced to the raspberry pi. The web-based application for trolleys and mobile-based application for baskets are designed to minimize the waiting time in “Queue” at the billing counters. At the billing counter, the confirmation of the total bill is done and the same is forwarded to the admin.

Keywords— Raspberry Pi, LCD, hybrid mobile app, web app, productivity, time, supermarket, malls, QR, Barcode, scanner

1. INTRODUCTION

Advancements in technology have inspired new developments in the industry, enabling end-users to reap the most benefits from it. Technology has also made lives easier than before. Technology has kept its approach always towards the betterment of humans, by providing a number of ways to develop lives. Mobile development technology has added more compact, reliable and easy to carry solutions. Today’s users are more active and social on the internet. Supermarkets and malls are a one-stop place offering all food and household products under one roof. According to research today’s customers are surfing more, shopping more in absentia that is shopping in

numerous ways including online shopping, teleshopping, etc. However, the fact identified is that customers avoid going to shopping in-person that is it involves a personal visit to the place to shop necessary products due to long queues at billing counters. The advancement in technology has inspired us to develop techno trolleys consisting of code scanners to assure secure purchase. The proposed system proves to be more cost productive, efficient, reliable and most important needs less labour and is comparatively less time-consuming. The solution is to reduce the queue at the billing counters including a mechanism to bill conveniently by creating an easy environment between customer and store-owner. The system will be more efficient regarding offering a great deal to eliminate time taken at the billing counter in supermarkets and increasing customer satisfaction. The basic idea of this project is to provide a system, which designed for a supermarket for improving the shopping experience. It helps users billing item and to store the history of purchase for future reference.

2. PROPOSED SYSTEM

2.1 Objective

The objective of the proposed system is to design and develop a system to eliminate time taken at the billing counter in the supermarket, increase customer satisfaction and reduce human intervention thereby reducing errors faced.

2.2 Functioning of the project

The project idea focuses on two basic solution variants based on the number of items purchased.

2.2.1 Mobile application for baskets: Aim is to provide billing for less quantity of items that can accommodate in the basket. This application needs to be downloaded and installed on any Android specific device to use full features.

2.2.2 Techno trolley: Trolleys enhanced with technological abilities that provide a smarter way to bill easily for more quantity of the items which need a trolley. The web application is integrated with IOT using raspberry pi 3 interfaced with 7” touch display.

The solution also demonstrates the use of web and hybrid application for ease of use to the user. Both the applications are developed with a sense of providing the user with a way to shop more productively. The system is capable of scanning, selecting, counting the total number of items and calculating the total amount. The items to be purchased are to be scanned using the barcodes present at the backside of the products. E-bill is generated accordingly based on the number of items scanned. The system uses Raspberry pi integrated with 7-inch LCD touch display to host the web application. The hybrid application acts as native when installing on iOS, Android or Windows. The system comprises two applications that are web and hybrid app in-order to enable users with trolley and basket respectively. The camera integrated with the system is capable of decoding the barcodes on the backside of every product.



Fig. 1: System architecture

Figure 1 depicts the typical structure of the proposed solution to the problem, where we have a raspberry pi module, battery module to power the raspberry pi, LCD touch display, and the camera module. All the modules are integrated on to the trolley for their purpose of serving solution.

We have used the latest model which is the Raspberry Pi B+ 3 - The backbone of the system.

A 10,000mAH power bank - This power bank is sufficient to keep the System on the techno-trolley running for up to 40 hours.

The output supply to raspberry pi is 5V/2A.

7” touch LCD display is integrated onto the trolley and thus making it techno-trolley. The 7-inch touch display is an interactive display which enables the customer to interact with the web application. Here the E-Bill is generated and displayed. The display is controlled by Raspberry Pi B+ 3 and an 8MP camera.

3. IMPLEMENTATION DETAILS

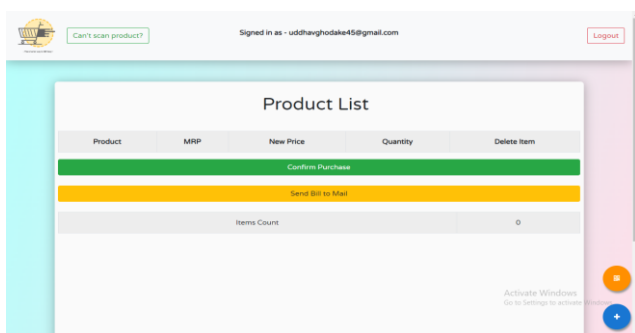


Fig. 2: Customer home-page

The figure. 2 is where the customer is greeted once user logs in to the system. This is where the user can generate unique QR for easy signing in next time, can enter the barcode value manually if the product is not scannable, can always scan and generate the e-bill for the list of items purchased, can delete the item if changes are made and can lastly send the bill in the form of PDF to his email address. The home page also shows the email address of the user when logged in. There is also a logout button which can be clicked after the purchase is done.

Figure-3 depicts the home page where the customer is shown scanning the QR code present on a product, and after confirmation that product is added to list as shown in fig. 4. We have used 'zxing.js' for decoding of barcodes and QR codes.

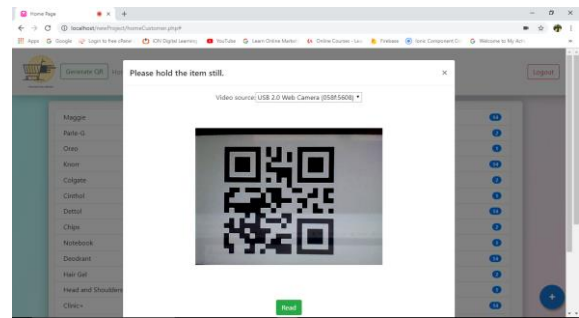


Fig. 3: Bill received on the user's email address

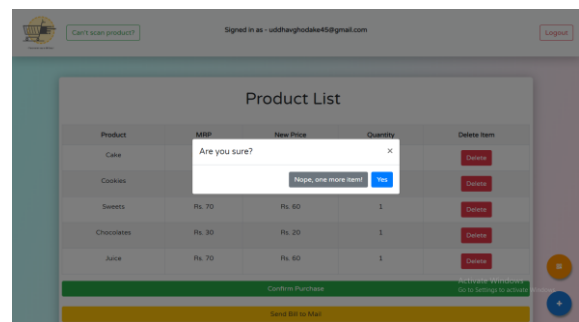


Fig. 4: Customer home-page (confirm purchase)

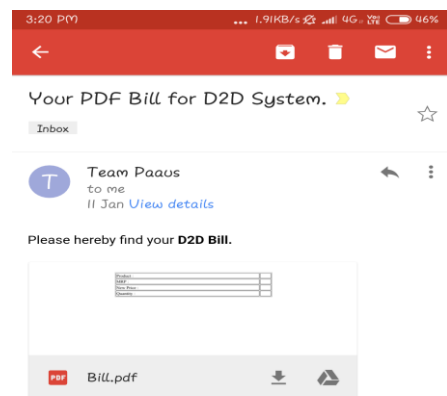


Fig. 5: Bill received on the user's email address

Figure 5 shows the received bill in PDF format, which is downloadable and can be used for future references.

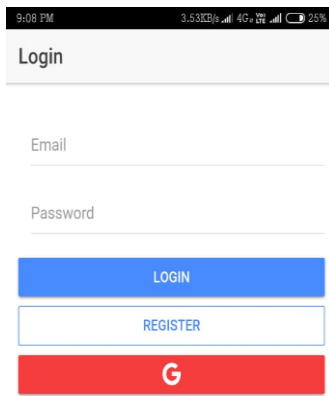


Fig. 6: Customer sign-in using registered email or Google account (optional)

The figure. 6 is where the user is supposed to log in to the system using the registered email address or the system also comes with an option of signing with Google account. We have used the Google sign-in API functionality for easy login of every customer, this functionality works as ‘single click login’.

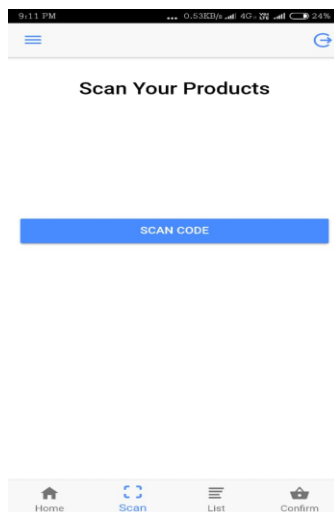


Fig. 7: Scanning of products

Figure 7 is wherein the customer inside our hybrid application running on Android OS is able to scan the barcodes present behind every product. After clicking the ‘Scan code’ button the barcode/QR code scanner is activated using the native camera of the device. And the barcode value is decoded and accordingly the list is generated as shown in fig. 8.

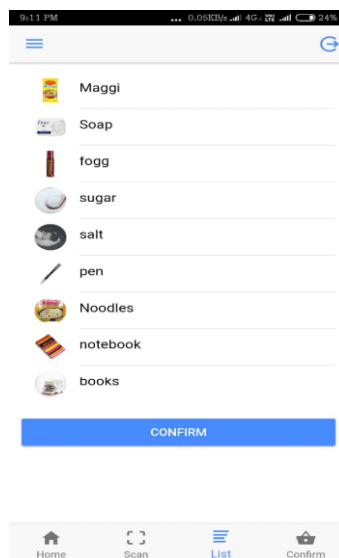


Fig. 8: Hybrid application product list

The hybrid application for baskets consists of a code scanner to scan the product and generate a list of products. After confirmation of the products, the bill is generated as shown in the figure 8.

Each techno-trolley is designed to scan the barcode present on the product with help of camera scanner and each scanned product is added to the list on the LCD touch display, which is interfaced with raspberry pi. After the customer confirms the product list, the bill is transferred to the admin computer by Wi-Fi connectivity between the techno-trolley and the admin (server). Each techno-trolley is identified by its unique identification device that is the raspberry pi. Finally, the bill is generated and the customer checks-out by paying cash or through payment gateways at the billing counter.

4. DEVELOPMENT DETAILS

4.1 Ionic framework

Ionic is a complete open-source SDK for cross-platform mobile app development and built on top of AngularJS and Apache Cordova. This way we are able to target a large variety of users using Android, iOS and Windows mobile devices, as users entering a shop can be any one of them. Ionic development is completely achieved using all the web scripting languages and mostly JavaScript.

4.2 Web application

A web application or web app is a client-server computer program where the client runs in a web browser. The scripting languages used for development are HTML5, CSS3, JavaScript, JQuery, PHP and MySQL for database purpose. The only factor a web app needs to run is a browser.

5. SYSTEM PROTOTYPE AND RESULTS



Fig. 8: System prototype

The results we aim to achieve are to provide smart billing system solutions in the current “Queue affected” traditional billing system, for the supermarkets and malls. The desired objectives were successfully achieved in the prototype model developed. The benefits of the system resulted to provide a robust technology with low-cost, high efficiency and easily adaptable system for making the process of shopping effortless.

6. REFERENCES

- [1] Dr.Suryaprasad J, Praveen Kumar B. O, Roopa D. Arjun - “A Novel Low-Cost Intelligent Shopping Cart”, Proceedings of the 2nd IEEE International Conference on Networked Embedded Systems for Enterprise Applications, NESEA 2011, Perth, Australia, December 89, 2011.
- [2] Suganya.R, Swarnavali. N, Vismitha. S, Mrs G.M. Rajathi “Automated Smart Trolley with Smart Billing Using Arduino” in International Journal of Advanced Research in

- [3] Zeeshan Ali, Prof. Reena Sonkusare, "RFID Based Smart Shopping and Billing", *International Journal of Advanced*