

## Research on the Development of a New Shop Application Using Android

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### Abstract

*Now a day's Android are the best and the most popular operating systems for Smartphones. Smartphone comprise of an important features through which user can easily distribute applications via online market store. Usually, customers in retail stores stand in a queue to do the billing of the products they want to buy which makes the customers to wait for a long time till they reach to the billing person. As in this modern and fastidious world, each minute is valuable for us so, the Mobile Shopping application saves our estimable time by making the billing process faster. This paper composed of a new mobile Shop Application practiced for an Android Smartphones, meant for the sales persons of big retail stores. In this Android application, data is stored using SQLite which is a type of embedded database and is stored within a single file on a disk.*

### Keywords

*SQLite Database, Android, Shop application.*

## 1. Introduction

Database technology, which is widely used in the business applications, has evolved from primitive file processing to the development of database management systems with query and transaction processing. As consumers Internet activities were shifted from the web to mobile, new opportunities to interact with products are becoming prominent. Mobile Shopping application is a retail application targeted for Android [8][9][16] device (i.e. an open source and Linux-based Operating System for mobile devices such as smartphones and tablet computers developed by the Open Handset Alliance, led by Google, and other companies)[10] which helps the customers in finding the product location in store,

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availability of the product, details of the product. This paper describes how the customer can buy the product much faster without standing in a queue for billing in front of billing counter. This application will be used by the sales person available in the shop and they will be roaming here and there in the shop. Customers, who want to buy any product they need to take help from the sales person for payment. The application used here composed of an Android 4.4 KitKat version which runs faster and have small footprint. And also the embedded database SQLite [13][15] is used to store the list of products available in a particular shop. Android allows users to customize their home screens with shortcuts to applications and widgets. The Android programs have an extension of .apk which is to be installed in the Smartphones. Android [11][12] programs are built in C, C++, or Java programming languages but the UI is perpetually made using Java. Android operating system is a stack of software components which is roughly divided into five sections namely Linux Kernel, Libraries, Android Runtime, Application framework and finally Application layer through which user will interact.

## 2. Literature Review

In 2012, Sunguk Lee [7] presents the overview of the Android platform towards software development for mobile and non-mobile applications which includes the usage of popular open source SQLite database as an on disk file format.

In 2012, Bhavana Malhotra et al. [6] focuses on the study of the transformation from paper-pen based approach to the mobile application approach, and giving the description about the two existing shopping list Apps i.e. "Out of Milk" and "Shopping List".

In 2013, S Santhosh Kumar et al. [1] focuses on the issue of building the portable smart data server for small scale business applications. In this paper one smart data server is designed for the shop which will handle all the client requests without using internet. Initially client has to register with all the details the smart data server and then the registered user can use their own mobile (Android/ Non-Android) to SMS

about the desired product they want to purchase and accordingly the smart shop will update all the things. This proposed method eliminates the need of internet, hosting website maintenance, personal computer or internet enabled smart mobile phone from customer side. The main advantage is the cost of implementation which is too low and doesn't require physical connection.

In 2013, Ashutosh Bhargave et al. [3] proposed an application for hotel management systems by web services technology is presented which increases the quality and speed of the services by giving the following systems like billing, Kitchen Order Ticket(KOT), Customer Relationship Management System(CRM). Above system is implemented by using android application for Tablet PC's. In this the frontend and backend is developed using Java and MySQL database respectively.

In 2013, A. Mallikarjuna et al., [4] describes the paper which deals with the history of the android, the early prototype, basic building blocks, application and features of the android.

In 2013, Shweta Shashikant Tanpure et al., [5] aims to automate the food ordering process in restaurant and also improve the dining experience of customer's feedback for restaurant. This system implements wireless data access to the server. The Android Application on user's mobile will have the entire menu in details. The order details from customer's mobile are wirelessly updated in central database and simultaneously sent to kitchen and cashier.

In 2013, P Vijaya Prasad et al., [2] describes the development of mobile application for shopping mall directory based on Wi-Fi. It also provides information for customer to enhance their experience in the shopping mall. Shop information like Shop names, Categories, locations, description and Floor Layout are provided in this mobile application.

### **3. Database for Android Application**

For Mobile Shopping application SQLite is the perfect choice to create databases. It is an in-process library that implements a self-contained, serverless, zero-configuration; transactional SQL database engine which does not require any database setup or administration.

Mobile Shopping application has one SQLite database in the SD card. It has all the items in the table. It has following tables:

1. *UserInfo table*: It contains the username and password.
2. *Product\_Main table*: It contains all items available in store.
3. *Cart table*: It manages the list of items user want to purchase.
4. *Promotion table*: It contains all the discounts/offers in the store.
5. *Related product*: This table contains the records of related products.
6. *Storemaster table*: It contains the location details of all items in the store.

Here the SQLite database is created and all the operations are done on table using java interface. The sample code for creating the database using SQLite:

```
public void onCreate(SQLiteDatabase myDB) {  
    String Create_UserInfo = "CREATE TABLE IF NOT  
    EXISTS UserInfo (" + "Primary_Id INTEGER  
    PRIMARY KEY AUTOINCREMENT," + "UserName  
    TEXT," + "UserPass TEXT);"
```

The sample code for creating the different table:

```
String Create_ProductMain = "CREATE TABLE IF  
NOT EXISTS ProductMainTable (" + "Primary_Id  
VARCHAR PRIMARY KEY," + "ItemCode  
VARCHAR," + "ItemDesc VARCHAR," + "OrigPrice  
VARCHAR," + "CustPrice VARCHAR," + "ProductImg  
VARCHAR," + "ProductName VARCHAR," + "StoreId  
VARCHAR," + "Saving VARCHAR);"
```

The sample code for inserting data into the SQLite database:

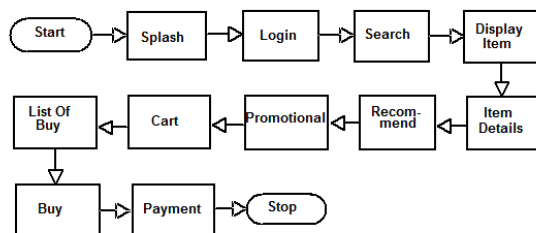
```
final String insertQuery14 = "INSERT INTO  
ProductMainTable VALUES('14','06234','A Beautiful  
Clock and stand', '$ 210.00', '$ 189.00',  
'R.drawable.clockandstand', 'Clock and stand', '2', '$  
21.00 (10%)');";  
myDB.execSQL(insertQuery14);
```

The sample code for retrieving products from the stored database:

```
public Cursor getAllproduct () {  
    SQLiteDatabase myDB = this.getWritableDatabase ();  
    Cursor cursor = myDB.rawQuery ("SELECT * FROM  
    ProductMainTable ", null);  
    return cursor;}  
}
```

#### 4. Design and Implementation

Mobile Shopping application is developed mainly using Eclipse IDE with Android Development Tool (ADT) plug-in but before this, system must be installed with Java Development Kit [14]. Android Emulator is used to design, debug, and test the applications in an actual Android run-time environment for application development.



**Figure 1: Flow chart for Shop Application**

The algorithm is composed of the following steps:

- Step 1: create package.
- Step 2: Import the reference Classes.
- Step 3: Create the Database named as myDB.
- Step 4: Create tables (i.e. Create\_UserInfo, Create\_ProductMain, Create\_CartList, Create\_PromoMain, Create\_RelatedProduct, Create\_storemaster, Create\_Stock)
- Step 5: Add values to the tables
- Step 6: Exception handler
- Step 7: Declare cursor for all tables to fetch values
- Step 8: Upgrade version
- Step 9: Insert values to table
- Step 10: Update values to table
- Step 11: Display Item details

#### 5. Results and Outcomes

Initailly the sales person of the shop will be provided with this App(i.e Shop application) and they all need to install it into their mobile (Android). After the completion of the installation part, they need to accomplish the login part as shown in Figure 4 by providing username and password for the

authentication purpose. Through this application there will be a dynamic interaction between customers and sales persons. When the customer wants to buy any product from the store, then, they they need to contact the sales persons for the product. For e.g if the customer wants to check whether “purse” is available or not or the price details etc. they will contact the sales person. Immediately, the sales person will click on the “Shop” icon, as Figure 3 and then the valid username and password will be provided for authentication as shown in Figure 4. After that the sales person will search for the purse whether its available or not by typing purse in the search box. When the user (i.e sales person) starts typing purse it starts showing the items related to purse (Figure 5).

There is also an option where user can see all the available items present in the shop. When any item is selected it will show the details of the product like item name, description, price etc. which is shown in Figure 6 and 7.

Further in the Cart screen, 3 option are available

1. Add to cart: On click of this button, the product will be added to list of items that customer wants to buy (in Figure 9).
2. Buy: It will redirect to payment page for payment and billing process (in Figure 10 and 11).
3. Recommend : Customer can recommend the product to their friends/relatives by just providing their name and email-id. A mail will be sent to his friend/ relatives with details of the products (figure 8).

A barcode scanner is integrated to search feature. This feature helps in faster billing process. Suppose a customer has picked 5 items and he wants to buy it. Now instead of standing in a queue, the customer can come to any sales person having this application on his Android device and do the billing itself through this application. Barcode scanner will scan the barcode on the product and will populate the product details from database. After scanning all items, he can go for payment in the application itself and finally customer will get the receipt of its payment.

The developed application consists of various activities as mentioned in Figure 1 namely:



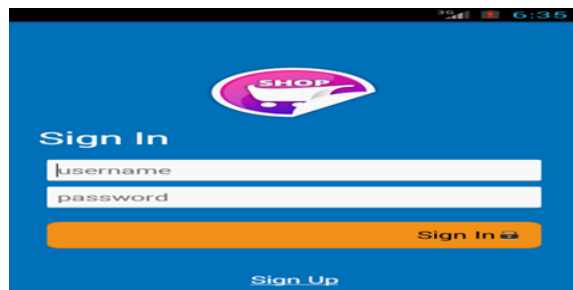
**Figure 2: Shop Application**

Splash Activity :This activity displays the Shop icon in the apps screen.



**Figure 3: Splash Screen**

Login Activity: After successful completion of splash activity the login activity will achieved in which user will enter into the login page which is used for authentication purpose.



**Figure 4: Login Screen**

Search Activity: Search feature is to find out the availability of any product. If the customer wants to check whether "purse" is available or not, then the customer can check by typing purse in the search box



**Figure 5: Search Screen**

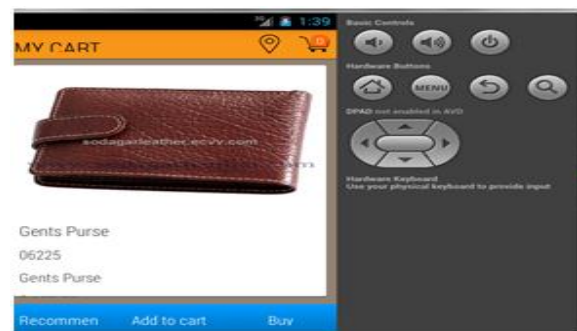
DisplayItem Activity:Dispalys all the items present in the shop.



**Figure 6: DispalysItem Screen**

ItemDetail Activity: The details (i.e cost of the item,bar code and desription of the product) of the various items can be viewed.

Promotional activity: This will show the list of offers/discounts on different products. Also user can search for any specific discount if any.



**Figure 7: Cart Screen**

Recommend Activity: Customer can recommend the product his friend/relatives by just providing his

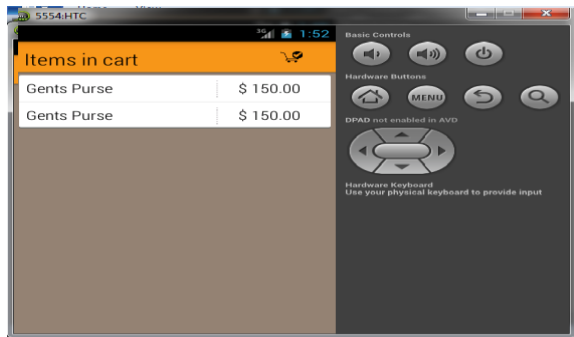
name and email id. A mail will be sent to his friend/relative with details of product.



**Figure 8: Recommend Screen**

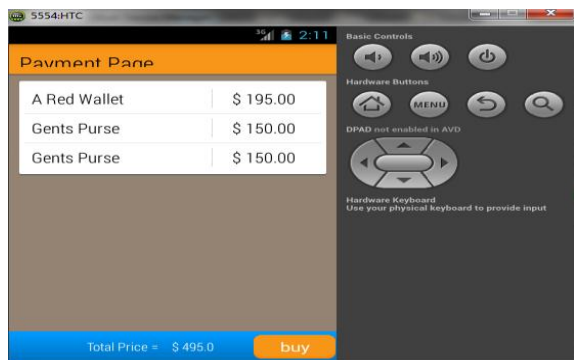
**Cart Activity:** On click of the cart button, the product will be added to list of items that user wants to buy.

**ListofBuy Activity:** The user can view the listed item which is to buy.



**Figure 9: ListofBuy Screen**

**Buy Activity:** It will redirect to payment page for payment and billing process.

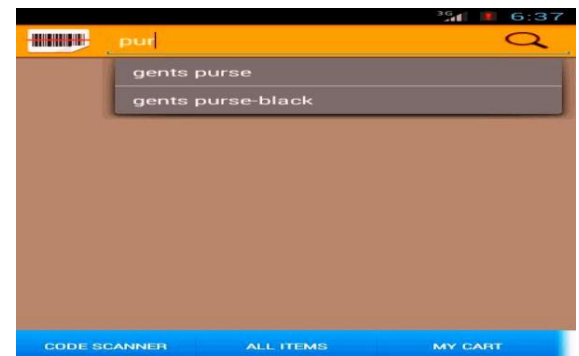


**Figure 10: Buy Screen**

**Payment Activity:** User will provide the payment details to proceed for the item delivery



**Figure 11: Payment Screen**



**Figure 12 : Barcode Screen**

## **6. Traditional Techniques vs New Shop App**

In traditional techniques,

1. The billing system was in context with paper-pen based approach which consumes lots time and maximizes the probability of human errors.
2. The customer has to wait for a long time for billing which itself is a drawback in terms of time.
3. Sometimes customer used to missout many things present in the shop because of lack of proper item list.
4. Maximise the load of shop workers.

In New Shop Application,

1. The billing system is basedon mobile application based approach which saves lots of time and minimizes the error.
2. This will avoid customer to stand in a queue for longer period.
3. This app provides the shop list so that nothing can be missed by the customer.
4. Minimizes the load of shop workers.

## 7. Conclusion

In this paper we have presented a Mobile Shop application, developed for Android using SQLite, mainly designed for sales person in retail stores to change the way people buy the items. The sales person will be provided with the Android devices with Shop application installed. They will be roaming here and there in the stores. Any user who wants to go for payment after selecting the products, he can take help from sales person for billing. The sales person will do the billing with the bar code scanner of the application and generate the receipt. This will help customers to avoid from standing in a queue for long time and saves a lot of time. The data storage problem is solved because of Android platform which includes the popular open source SQLite embedded database.

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## References

- [1] Santhosh Kumar S, Sudarshan K., "Smart Data Server for Smart Shop", IOSR Journal of Computer Engineering, Vol. 11, Issue 2, pp.51-56, June 2013.
- [2] P.VijayaPrasad, NurulFadzlina, MuradSaadi et al., "Shopping Mall Directory: A Detailed Guide Application for Android-Based Mobile Devices", ARPN Journal of Systems and Software, Vol. 3, No.6, pp. 129-135, October 2013.
- [3] Ashutosh Bhargave, Niranjana Jadhav, et al., "Digital Ordering System for Restaurant Using Android" International Journal of Scientific and Research Publication, Vol. 3, Issue 4, April 2013.
- [4] A.Mallikarjuna and S. Madhuri, "Unveiling of Android Platform", International Journal of Advanced Research in Computer Science and Software Engineering, Vol. 3, Issue 7, pp. 1264-1267, July 2013.
- [5] Shweta Shashikant Tanpure, Priyanka R. Shidankar and Madhura M. Joshi, "Automated Food Ordering System with Real-Time customer Feedback", International Journal of Advanced

Research in Computer Science and Software Engineering, Vol. 3, Issue 2, pp. 220-224, February 2013.

- [6] Bhavana Malhotra and Ram Govind Krishnan, "Analysis of Shopping List Apps for Android & iPhone", Theory and Research in HCI-Symposium, 2012.
- [7] Lee Sunguk, "Creating and Using Databases for Android Application", International Journal of Database Theory and Application, Vol.5, No.2, June 2012.
- [8] Wei-Meng Lee, "Beginning Android Application Development", Wiley Publishing, Inc., [2011].
- [9] Liu Jianye, Yu Jiankun, "Research on Development of Android Application", Fourth International Conference on Intelligent Networks and Intelligent Systems, pp.69-72, [2011].
- [10] POCATILU Paul, "Developing Mobile Learning Application for Android using Web Services", Informatica Economica, Vol.14, No.3, [2010].
- [11] Young Hong, Wu JianchaoLuo, "Porting mobile web application engine to the Android application", IEEE computer society, pp.2157-2161, [2010].
- [12] Wei Hu, Tianzhou Chen, Quingsong Shi and Eueqing Lou, "Smartphone Software development Course Design Based on Android", IEEE International conference on Computer and information Technology, pp. 2180-2184, [2010].
- [13] BI CHUNYUE, "Research and Application of SQLite Embedded Database Technology", WSEAS Transaction on Computers, Issue 1, vol. 8, January 2009.
- [14] Reto Meier, "Professional Android Application Development", Wiley Publishing, Inc, [2009].
- [15] Grant Allen, Mike Owens, "The Definitive Guide to SQLite", *Après*, Second Edition, [2006].
- [16] Michael A. Olson, "Selecting and Implementing an Embedded Database System", *IEEE Computer*, pp. 27-34, September 2000.



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