

# Implementation of Improved Billing System

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## ABSTRACT

Paperless billing is a process that businesses can use to get paid quickly and securely without dealing with the hassles of paper bills and check payments. Paperless bills allow bill delivery and payment to take place completely online, which improves efficiency while reducing costs.

Paperless Billing generally involves integrating multiple systems. These include billing system, the banking industry, customer's paying system, as well as an online interface for the paperless billing system. Paperless billing is most helpful for businesses that send recurring bills to customers. Paperless bills are an option for delivering bills. Bills could be presented as electric documents, such as PDF, or on websites. This gives the customer the ability to review bills before sending payment. Alternately, customers can also set up automated payments in order to pay without even touching a button. We can shop and create bills by using the mobile application. Paperless Bills offer benefits to both the seller as well as the customer. Some of the biggest benefits from Paperless Billing include:

- Low cost of delivering the bills to customers
- Better security than paper and snail mail
- Option for automatic storage of bill

When user scans bar code from the product, the user application extracts the product data and displays it on the system application. The user is then asked whether they want to add more products. If user wants to add more products, the user can add it, otherwise user can quit and the bill will be generated and displayed on the screen with the price of the products totaled. The QR code is then generated. The customer can then scan the QR code and the bill will be transferred to the customer's phone. The bill can be saved by the customer on their phone.

**Keywords:** Paperless Bill, QR Code, Smartphone, Business

## I. INTRODUCTION

A bill is a record of statement, and transaction of the money. Bill is used to keep record of business when a person buys some goods or any valuable things. To

maintain smooth usage of the bill from creation of the bill, analyzing it and the printing the bill to manage all the process we need a billing system. Billing system was started in the medieval period when people started buying things. The shopkeeper used to keep

track of the all the products sold to the customer and how much products was there in their reserve. They need to write down all the records in a record book manually [3]. The bill is not just for keeping the record of transaction, the bill is used for so many other purposes. They use the data from the bills to control the extra expenditure and spend on what is needed and also use it to improve their businesses.

As the technology came into the picture the written bill management started turning into digital. Initially, they introduced a simple billing management system. Software was used on computers to generate and print the bill. The administrator only is allowed to record and bill the all the purchased goods, employee details and modify the prices with the aid of a database functions. The goods are arranged in categories in the database [1]. Software was designed to handle the time and bill tracking as well as keeping customers informed of their purchase of services and goods. Billing software can track the hours worked by employees, the number of the goods, as well as expenses related with projects or customers. Most billing software applications are capable of creating billing reports. These reports can display information such as hours worked, expenses incurred, how much to bill customers, and which customers owe how much money for which goods, total investment, and total income of the month.

Few examples of the billing management systems are:

1. Sage Timeslips
2. Intuit QuickBooks Time
3. Billing Tracker and kBilling.

## II. IMPLEMENTATION

This project is based on the sales transaction and billing of items in a supermarket. The first activity is based on adding the items to the system along with the rate which are present in the supermarket and the name of the items which the supermarket will agree

to sell [2]. The models provide four basic types of functionality, that is, create, read, update, and delete the resources. This is often referred to as CRUD by computer scientists. A model should have the ability to perform all these four functions in order to be complete. If an action cannot be described by one of these four operations, then it should be contained in a model of its own. The CRUD paradigm is commonly used to construct web applications, as it provides a memorable framework for reminding developers of how to construct complete, usable models.

We use python to build the functionality of the application and graphics user interface (GUI). We use the SQLite database to store the application data and transaction data. Using this database, we add, update, delete, and keep track of the transactions. We make use of different libraries of Python, like Tkinter, qrcode, pyzbar, Sqlite to build the application.

### A. Overview of Steps using Libraries and Tools

- First, the layout of the system is made by using Tkinter
- Then, the store's database is created using SQLite
- Connection between database and the GUI is created using Python
- Using Python, we created cart module where we add products
- Then, we create module to generate the bill
- "pyzbar" is used to create bar code reader (decoder) module
- "qrcode" is used to create the QR code generator module
- Android studio is used to create QR code scanner application for android devices

### B. Working of System:

- First, the bar code scanner module is launched
- Then, the "add to cart" module is displayed on screen
- The user scans the product bar code using the camera of the system

- The EAN number of the product gets entered in the “add to cart” module
- Then, the product gets added to the cart
- After adding all products to cart, customer pays the amount
- The bill is created and stored on the system in a folder of that day’s date
- Then, the equivalent QR code of the bill is generated by the system and appears on the screen
- Then, the customer uses the QR code application on their phone and scans the QR code
- Finally, the bill gets decoded by the application and the bill is transferred to their phone with the QR code image and they can save it on their phone.

### III. ARCHITECTURE AND MODULES

#### A. Modules

1) Add to the Database: This module is used to add new products to the store database. User needs to enter the data about the product before adding, and then add it to the database.

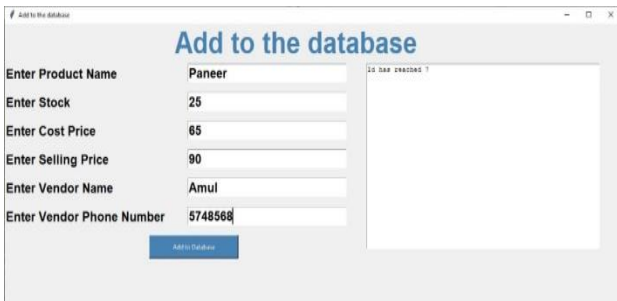


Figure 1. Add to the Database

2) Update the database: This module is used to update the product stock and change the details about any existing product. It will ask for the product ID and then give you details of the product like their price, quantity, etc.



Figure 2. Update the database

3) Main application: This module is the main module of the system all the work is carried and connection between all the modules. This modules creates the cart add product to it and then creates bill.



Figure 3. Bill module

Store Pvt. Ltd.  
Bangalore  
7878787878  
Invoice  
2020-03-07

SN.	Products	Qty	Amount
1	Facewash	1	150
2	Kitkat	1	30
3	Munch	1	35
4	milkybar	1	30
5	oreo	2	40
			Total:325
			Time:18:24:46
			Bill:5824

Thank you for visiting us

Figure 4. Sample Bill

4) Barcode Scanner module: This module uses the system web cam or any camera attached to the system and decodes the bar code.



Figure 5. Barcode scanner

5) QR Code Generator module: This module takes the bill as the input and then converts it into the equivalent QR code and display of the system.



Figure 6. QR Code Generator

6) The Android Application for scanning the QR Code and Saving Bill: The android application scans the QR code from the system and displays the bill on the customer's phone.

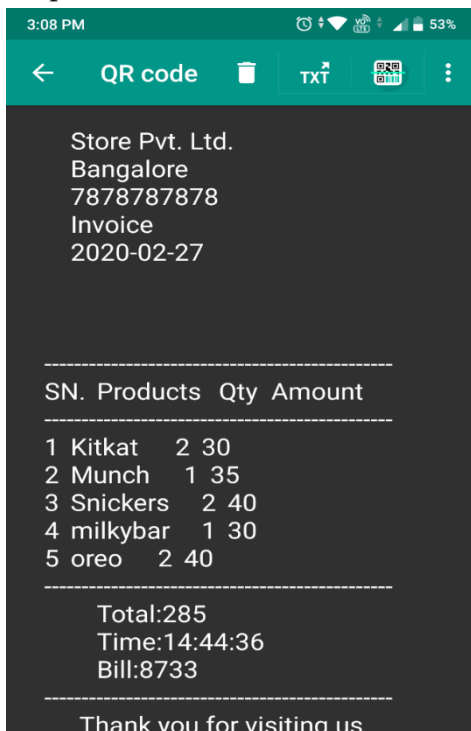


Figure 7. Scanned bill

### QR code



Store Pvt. Ltd.  
Bangalore  
7878787878  
Invoice  
2020-02-27

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#### SN. Products Qty Amount

1 Kitkat	2	30
2 Munch	1	35
3 Snickers	2	40
4 milkybar	1	30
5 oreo	2	40

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Total:285  
Time:14:44:36  
Bill:8733

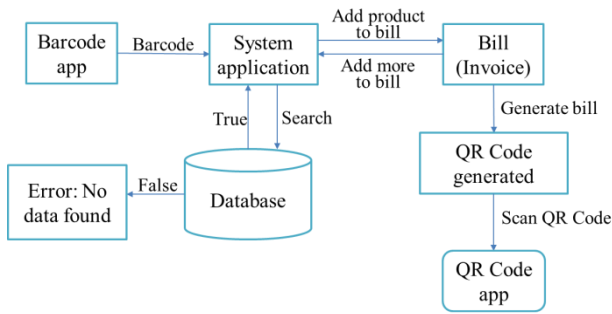
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Thank you for visiting us

Figure 8. Scanned QR Code on phone

### B. Architecture

The software architecture of an application or system is an illustration of the system application that helps in understanding how it works and behaves. The architecture is presented as the blueprint for the system and the project developed in the system, defining how the work must be carried through designing and implementation of project. The architecture is the first carrier of system qualities. These qualities are performance, modifiability and security[5]. These cannot be achieved without combining the architectural vision of system and team. Architecture is a useful way of early analysis to make sure that a design approach will produce a well-designed and acceptable system. By building an effective architecture, you can find out design risks and eliminate them early in the development process of system.



**Figure 9.** Architecture

**Barcode app:** It is used to scan the bar code on the product and decode and write the EAN on the display of the system.

**System Application:** It is the main application where all the functions get executed. Tasks like adding product to cart, deleting the product from cart, creating bill saving bill on file system are performed.

**Database:** It is where all the data of the store and product is saved and can be manipulated. We can add new products or update stock of the products. System application uses this database[4] to carry out its different functionality.

**Bill (Invoice):** The bill is generated by the system application and is stored on the file system and maintained.

**QR code Generator:** This is used to create QR code equivalent of the bill and display it on screen.

**QR code Application:** this android application is used to scan the QR code and save the bill on their phone.

**IV. CONCLUSION**

This project was about improving the existing billing system by making it digitalized. A better way of billing system was implemented. Instead of a printed bill, the customer obtained a digital copy of it, which reduced the wastage of paper. This also helped the seller to save the cost of buying paper. The bill was first stored in the seller’s system in an organized manner. After that, a QR code was generated, and this QR code could be

scanned by the customer and be transferred to their device. This also ensured the customer wouldn’t lose their bill. This project was implemented to make the process of billing more efficient

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