International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Multilingual Billing System

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ABSTRACT :

This project focus on developing a multilingual billing system that allows retailer to generate a bill in customer preferred language. The system is integrated with MySQL for data storage supports the auto suggestion of items and sends the translated bill to the customer email. A key feature is the dynamic language translation using Deep Translator library ,ensuring that the customers receive the bill in chosen language.

Keywords: Deep Translator, Smtlib, Multilingual, Mysql

1.Introduction :

Business operations heavily depend on billing systems as they aid smooth financial transactions, accurate and updated record keeping, and even better customer services. Businesses have evolved from manually billing using paper and pens to computerized automated systems over the years to increase efficiency. Unfortunately, many existing billing systems do not provide the possibility of assistance with language translation as well as automated invoice digitization, which is critical in setting bilingually diverse clientele. This project strives to build a billing software that is multilingual and sends invoices via emails in the chosen language by the customer to ensure that their interactions with the business are completely paperless. The traditional way of invoicing tends to be slow and inefficient because of many inconsistencies such as all manual addition, misplaced files, and slow mail delivery systems. Digital parts of the billing system improve the time consumingly lengthy process through better human error mitigation, speed, and automation.

The new system is built on a database that assures better invoicing accuracy, better customer information management, and faster transaction processing. It also makes use of the Deep Translator library that enables multi-language invoicing, enabling enterprises to issue invoices in preferred languages for their customers. In addition, customer data including language.

2.Literature Review :

A multilingual billing system requires the integration of advanced technologies such as relational databases, translation modules, and automated email services to ensure efficient customer transactions and improved user experience. Several studies highlight the significance of database management, language translation, and email automation in modern billing systems.

The study introduces models designed to translate languages efficiently, thereby enhancing customer support systems by providing invoices in customers' preferred languages. This feature ensures personalized billing experiences and reduces communication gaps (Shaik, 2023).

The MySQL relational database plays a crucial role in managing billing operations. A well structured database enhances accuracy, maintains customer records, and efficiently tracks transactions. MySQL's ability to handle large datasets while performing CRUD (Create, Read, Update, Delete) operations ensures seamless data retrieval and minimizes errors during real time billing. Additionally, database normalization prevents data redundancy, providing faster access to customer details (Arun et al., 2022).

Email automation is another essential aspect of billing systems that enhances customer communication. By using libraries like smtplib in Python, bills can be automatically generated and emailed to customers immediately after a transaction. This reduces manual intervention, ensures prompt delivery of invoices, and improves operational efficiency (Srinivasan & Rajesh, 2021).

In multilingual billing systems, databases play a dual role by storing customer preferences— such as language and currency—and dynamically applying this information during bill generation. Using relational databases like MySQL allows the system to translate invoices in real-time. Furthermore, the implementation of indexing is crucial to accelerate data retrieval, especially in high-volume retail environments (Kumar & Sharma, 2022).

Combining billing with automated email delivery significantly improves customer experience. Integrating billing systems with email modules enables real-time delivery of multilingual invoices. This approach uses Python's smtplib library to streamline the generation and dispatch of invoices, ensuring that customers promptly receive their bills in their preferred languages (Patel et al., 2023).

Database optimization techniques are critical for improving billing system performance. Methods such as indexing, query optimization, and caching improve the speed of data retrieval and handling large transaction records. These optimizations ensure real-time bill generation while maintaining data integrity. Additionally, triggers can be employed to automate post-transaction tasks, such as sending email receipts and updating customer records (Mehta & Verma, 2022).

These studies collectively demonstrate the importance of integrating databases, multilingual translation, and email automation in modern billing systems. A well-optimized relational database ensures efficient data management, while automated translation and email delivery enhance customer satisfaction and operational accuracy.

3.Implementation :

This project is based on sales transaction and billing of items. The first activity is to enter the customer phone number, customer name, email id, preferred language and the address of the customer. Totally it has five function they are getting the customer details, adding the items that are purchased by the customer, generating the total of the bill , translating the bill to customer preferred language, storing the bill in the database and sending the bill through email to the customer .If the customer is already a existing customer of the shop already the details of the customer are stored in the database and if we enter the phone number of the customer all the rest of the details will be filled automatically. We can fetch the item name from the dropdown box and the price will be auto filled and if the item is not existing in the database we can enter the item name and price manually. After entering the items click the generate bill button and the bill will be produced in customer preferred language and after that click the proceed button. Immediately after clicking the proceed button the bill will be stored in the database and bill will be send to the customer through email.

4. Modules :

4.1. Customer Module

In this module we need to enter the data of the customer(phone no, name , email, preferred language and address).If the customer is already a existing customer we need to type only the phone number the rest of the will be retrieved from the database, this saves the time while processing the bill and if the customer is new to shop we need to enter all the details of the customer only one time.

4.2. Item Module

In this module we need to enter the item name, quantity and price of the item. Already dataset of item name and price list uploaded. In item name field if we type the starting letter of the item this module fetches item name in the dropdown menu and if we select the item the price will be auto filled.

4.3. Billing Module and Translation Module

In this module it calculates the total bill by adding all the items price and multiplying with quantity and the total amount of the bill will be calculated and displayed in the customer preferred language. It uses deep translator library integrated in python for translating the bill dynamically according to the customer preferred language .

4.4. Transaction Module

This module is responsible for storing all the customer details and purchase history of the customer in the MySQL. It also has items table that stores the items name and price of the item. Billing_history, table that stores the customer details and the purchase history of the customer.

4.5. Email Module

This module is responsible for sending the bill to the customer mail id. This module uses smtlib to send the mail to the customer. The email of the bill will be send in the customer preferred language so that it ensures multilingual billing.

5.METHODOLOGY :

The approach to creating a multilingual billing system is all about ensuring that customer transactions run smoothly, billing is accurate, and emails are sent out automatically. This system brings together different modules to manage customer information, handle items, generate bills, translate languages, and communicate via email. Here's a breakdown of how it all comes together:

5.1. Customer Data Management

It all starts with gathering key customer information like their phone number, name, email address, preferred language, and home address. When a new customer signs up, their details are saved in a MySQL database. For returning customers, just entering their phone number pulls up their information automatically, which cuts down on manual errors and speeds up the billing process.

5.2. Item Selection and Price Retrieval

The system features a user-friendly dropdown menu for selecting items, with names and prices already loaded from the MySQL database. If an item isn't in stock, users can manually enter the item name and price. This flexibility keeps things running smoothly while ensuring data accuracy. Each item added to the bill is kept on hold until the billing is finalized.

5.3. Bill Generation and Calculation

After all items are selected, the system calculates the total bill, factoring in item prices and quantities. The user simply clicks the "Generate Bill" button to start the bill creation process. Thanks to the Deep Translator library in Python, the bill is then translated into the customer's preferred language, making for a more personalized experience with invoices available in multiple languages.

5.4. Database Integration and Data Storage

Once the bill is generated, all transaction details—like customer info, purchased items, and the total amount—are securely stored in the MySQL database. CRUD (Create, Read, Update, Delete) operations are used to manage and update customer records efficiently

5.5. Data Flow Diagram

5.5.1. LEVEL 0

The Level 0 DFD (Context Diagram) of the Multilingual Billing System shows: Customer (External Entity) – Provides input such as phone number, name, email, preferred language, address, and purchased items. Multilingual Billing System (Process) – The main system that handles customer details,. item entry, bill generation, translation, data storage, and email sending item entry, bill generation, translation, data storage, and email sending

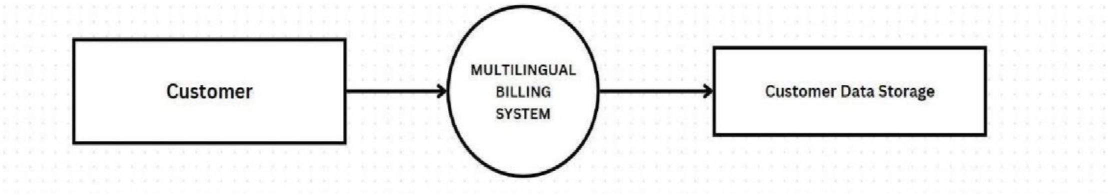


Fig.1.Level 0 DFD

5.5.2 .Level 1

This Level 1 Data Flow Diagram (DFD) expands on the Level 0 DFD, breaking down the core process (Multilingual Billing System) into five sub-processes. It shows how data flows between the customer, the system, and the database.

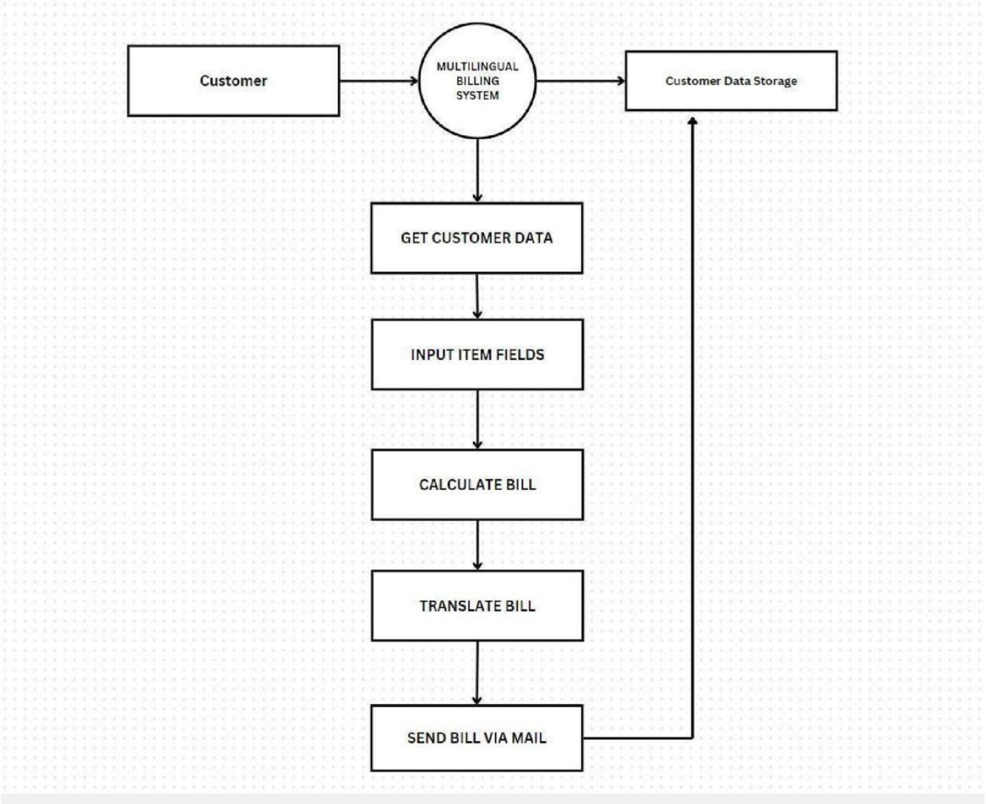


Fig.2 Level 1 DFD

5.5.3.Level 2

The Level 2 Data Flow Diagram (DFD) of the multilingual billing system details the entire billing process from customer interaction to bill delivery. It begins with the customer providing their phone number. If the customer already exists, their data is retrieved from the customer data storage; if they are new, their information is collected and stored. For item entry, the system fetches items from the existing data list or allows manual input if the item is unavailable. Once the item details are entered, the system calculates the bill, translates it into the customer's preferred language, and sends it via email.

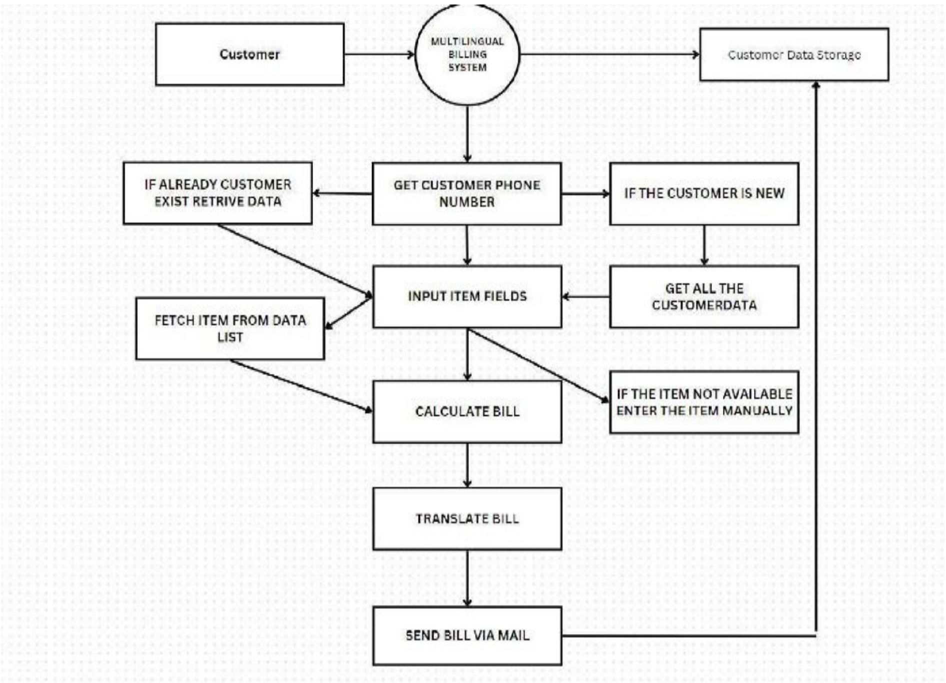
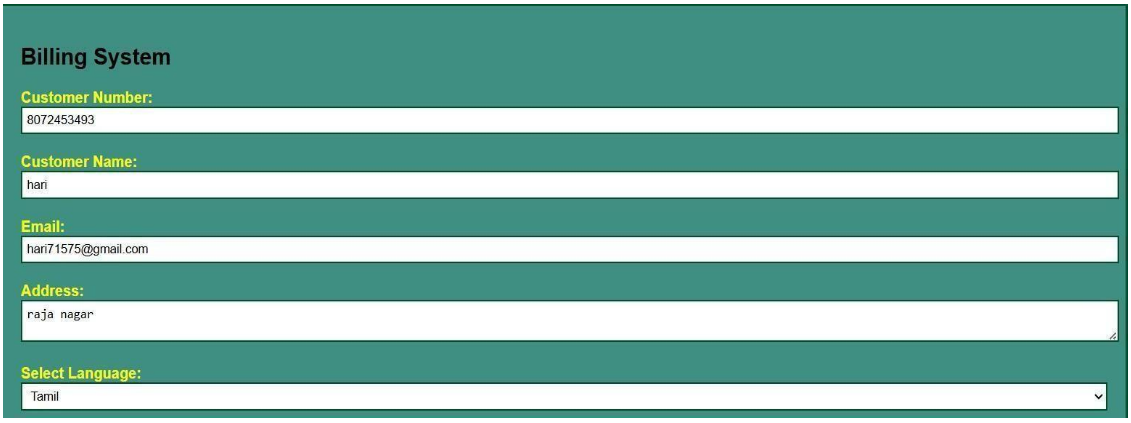

Customer
MULTILINGUAL BILLING SYSTEM
Customer Data Storage
IF ALREADY CUSTOMER EXIST RETRIVE DATA
GET CUSTOMER PHONE NUMBER
IF THE CUSTOMER IS NEW
INPUT ITEM FIELDS
GET ALL THE CUSTOMERDATA
FETCH ITEM FROM DATA LIST
CALCULATE BILL
IF THE ITEM NOT AVAILABLE ENTER THE ITEM MANUALLY
TRANSLATE BILL
SEND BILL VIA MAIL

Fig. 3. Level 2 DFD

5.6. Screen shots



Billing System

Customer Number:
8072453493

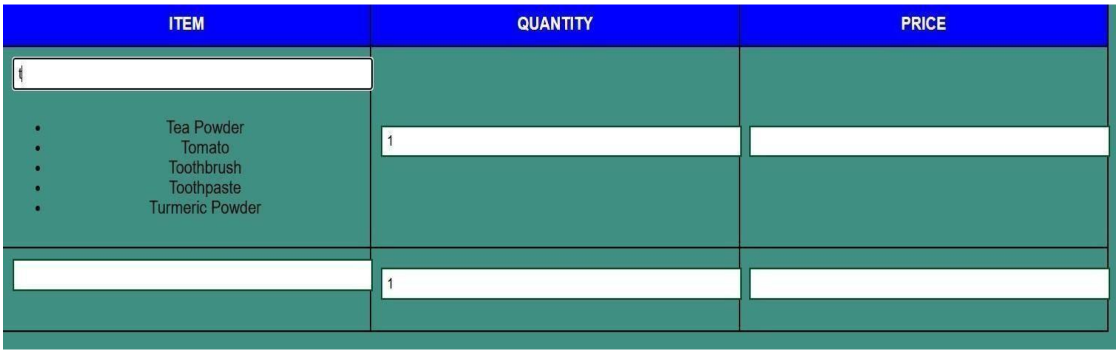
Customer Name:
hari

Email:
hari71575@gmail.com

Address:
raja nagar

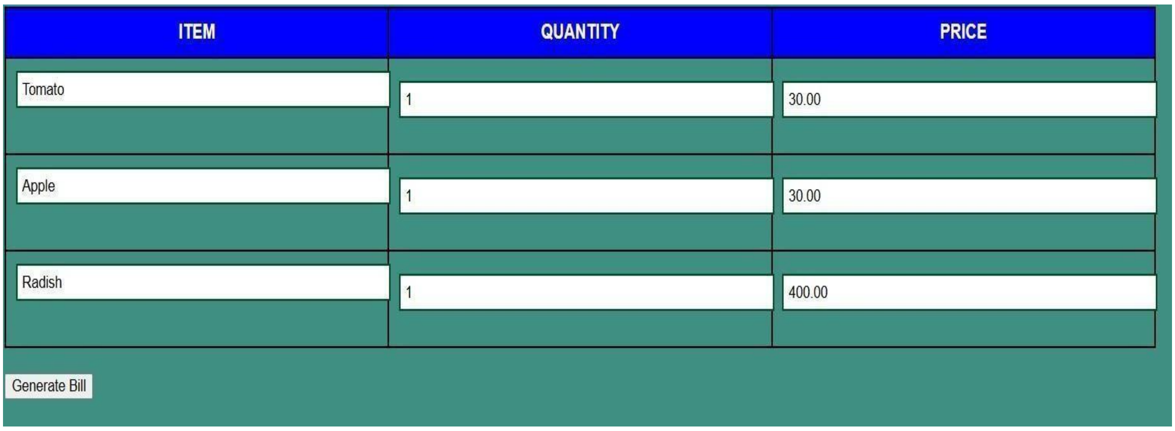
Select Language:
Tamil

Fig 4.Getting Customer Data



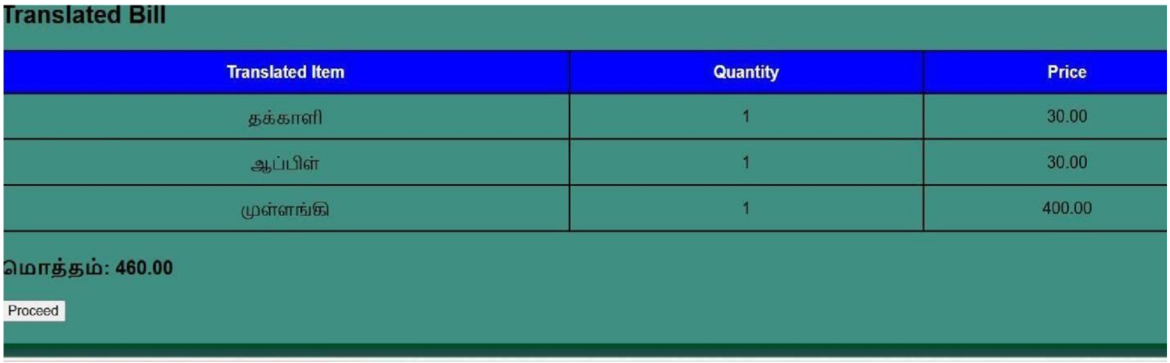
ITEM	QUANTITY	PRICE
t Tea Powder Tomato Toothbrush Toothpaste Turmeric Powder	1	
	1	

Fig 5.Fetching items



ITEM	QUANTITY	PRICE
Tomato	1	30.00
Apple	1	30.00
Radish	1	400.00

Fig 6.Generating Bill

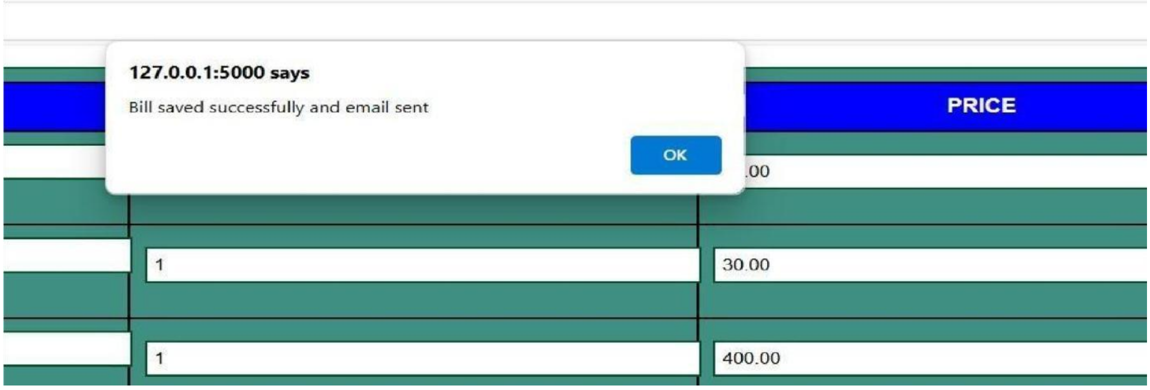


Translated Bill

Translated Item	Quantity	Price
தக்காளி	1	30.00
ஆப்பிள்	1	30.00
முள்ளங்கி	1	400.00

மொத்தம்: 460.00

Fig 7.Translation of the bill



127.0.0.1:5000 says

Bill saved successfully and email sent

.00

1 30.00

1 400.00

Fig 8.Saving and Sending Email.

6.CONCLUSION :

In conclusion, the multilingual billing system provides an efficient, accurate, and customer friendly solution for modern business operations. By automating the billing process and supporting multiple languages, the system addresses the limitations of traditional manual invoicing methods, reducing errors and improving transaction speed. The integration of the Deep Translator library enables personalized invoices in the customer's preferred language, enhancing customer satisfaction and facilitating business expansion across diverse linguistic regions. Additionally, the system's email-based invoicing supports paperless transactions, reducing operational costs and contributing to environmental sustainability. This comprehensive and user-friendly billing solution not only improves financial accuracy but also streamlines customer data management, making it an ideal tool for businesses seeking to modernize and optimize their billing processes.

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