

# Smart E-Pay Application

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**Abstract—** *The Smart Pay initiative is the use of an electronic payment system with the same name that allows users to pay for goods and services electronically. You can use electronic payments to buy goods from your favorite online retailer or pay your cable bill online. If you want to open an online store, an eCommerce payment system is essential. Smart Pay is a web-based payment service. This project will be created so that the user may make all of their payments, such as electric bills, water bills, and bank transactions. Python with SQL is used to create Django-based Web applications that are portable, efficient, and intelligent. The key characteristic of this program is that the user is required to login; after the user has logged in, the user can conduct any type of transaction in a safe and secure manner. The transaction is secure since the OTP will be requested for each transaction, ensuring that there is no duplicate in the transfer. The project also has a chatbot system that answers all of the customer queries. The project's key features include checking bank balances, changing UPI pins by using an OTP, safe login, and user friendliness. All of these components will contribute to the project's interactive nature.*

**Index Terms--** *Smart E-Pay, Electronic Payment App, Online Payment Application, OTP, Chatbot*

## I. INTRODUCTION

An electronic payment is a type of payment that makes use of information and communication technology including integrated circuit (IC) cards, cryptography, and telecommunications networks. Electronic payment systems are required in order to adapt to fundamental changes in socioeconomic trends. However, an economy's stability and development capabilities may be severely hampered by an inadequate payment system. Its failings can lead to inefficient use of financial resources, unequal risk-sharing among agents, actual losses for participants, and a loss of trust in the financial system and the use

of money itself. Certain solutions applied help in the reduction of a few vulnerable areas of payment processing, since it is a responsibility to maintain the purchase process under control and limit the danger of fraud at every step of the checkout process. Smart pay is a scheme in which end-to-end encryption is used to ensure that there are no fraudulent situations. It will also include libraries that aid in the distinct identification of transactions by assigning unique hash codes to each one. The program can be used as a wallet, which is safer and more efficient than the physical form because the money will not be mismanaged by a third party due to human mistake. The user begins by inputting his or her username and password; if the username and password match, the user is then asked to choose a billing option, such as energy, water, or cell recharge. The needed fields should be filled correctly after the selection is done based on the user's required option. The user must input the pin number that he or she created during registration, which is then checked against the database. If the pin number entered is correct, the transaction successful screen appears. While entering the details or the login credits, pop-up messages and error warnings are displayed to prevent duplicate entries or incorrect inputs. This improves the app's efficiency and helps the user avoid making mistakes. The user's details and transaction information are stored in the SQLite database. The database is made up of many tables that store information in a straightforward and normalized manner. For example, the energy, water, and mobile databases were established to store specific values in their respective tables, making it easy to refer to and change customer transaction details.

## II. PROCEDURE

The user begins by inputting his or her username and password; if the username and password match, the user is then asked to choose a billing option, such as energy, water, or cell recharge. The needed fields should be filled correctly after the selection is done

based on the user's required option. The user must input the pin number that he or she created during registration, which is then checked against the database. If the pin number entered is correct, the transaction successful screen appears. While entering the details or the login credits, pop-up messages and error warnings are displayed to prevent duplicate entries or incorrect inputs. This improves the app's efficiency and helps the user avoid making mistakes. The user's details and transaction information are stored in the SQLite database. The database is made up of many tables that store information in a straightforward and normalized manner. For example, the energy, water, and mobile databases were established to store specific values in their respective tables, making it easy to refer to and change customer transaction details. Online payment options make it simple to sell goods and services over the internet. Automatic online payments are convenient for both you and your clients. Online payments often go immediately into your bank account after processing delays, posing a low risk of theft. It has several methods for transferring money, like scanning QR codes, entering bank information, and so on.

### III. RELATED WORK

Aidi Ahmi, Siti Zabedah Saidin, and Muhammad Auwal Kabir wrote in their paper that the invoice required a lengthy process after an E-payment transfer, but that the invoice is now available immediately after any type of payment via E-Payment [1]. According to Moshe Handelsman and J Munson, E-Pay requires payment via credit or debit cards from a specific bank by entering the card number, then the CVV, and finally an OTP to complete the payment process. However, registering a card with the E-Pay app once solves the problem by eliminating the need to enter the CVV or OTP every time, and it is also a secure process [2]. Babita Singla and Manish Bansal (2015) discovered that shoppers are satisfied with plastic use, and non-platinum card customers are interested in using the card for purchases and intend to do so in the near future. Banks and other financial institutions, on the other hand, encourage the usage of plastic cards [3].

### IV. METHODOLOGY

The customer selects an item and withdraws their card. A transaction is submitted by the merchant. The transaction is safely sent to the processor by the program. The transaction is verified and approved by the processor. The processor receives funds from the customer's bank. The processor transfers funds to the merchant's bank account. The processor informs the software whether the transaction has been allowed or rejected. The merchant receives the approval or rejection notification. The money for the sold item is sent to the vendor.

#### 4.1. System Architecture

The transaction time will be faster because the user will not have to wait for the payment confirmation. Additionally, the user can utilize this virtual software as a virtual wallet, reducing the physical load of carrying a wallet that may be vulnerable to human error.

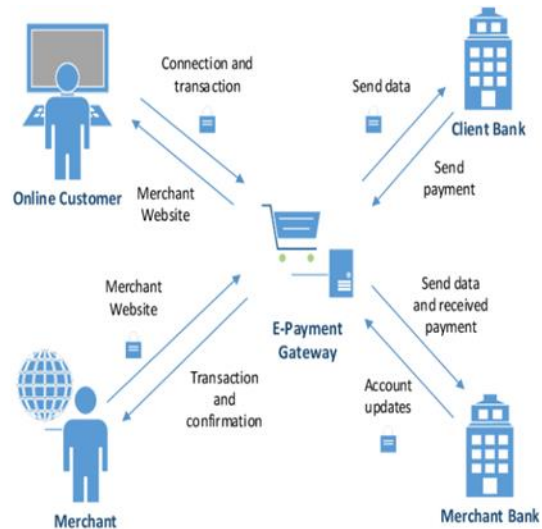


Figure 1. System Architecture

#### 4.2 Artificial Intelligence

##### 4.2.1. Chatbot with AI (Artificial Intelligence)

Smart Pay enables shoppers to make purchases in any worldwide market and at any time of day. Users shop online for the convenience of completing a

transaction, and as a merchant, you must cater to this inclination. By communicating with your clients, chatbots can help you collect valuable data. This entails learning about their activities, preferences, and difficulties, among other things. Chatbots can be used to provide instant assistance to potential customers. When their problems are remedied quickly, they may take the action you want. This could mean that the software becomes more affable, allowing for more efficient transactions. Unexpected technical failures can cause many hours of outage, which can be frustrating for customers who can't pay directly. These can be moderated immediately by the automated chat box with the correct communication and support tactics. In the near years, online payments are projected to become the standard, and recent economic times have only hastened this trend.

#### 4.2.2 NLP (Natural Language Processing) with AI

Chatbots can *learn* by detecting patterns in data thanks to artificial intelligence (in the form of natural-language processing, machine learning, and deep learning, which we'll examine later). These chatbots can then apply the pattern to comparable situations or slightly different inquiries without any training. This capability allows them to accomplish activities, solve problems, and handle information without the need for human participation. NLP is what allows your chatbot to interpret a user's statement and respond appropriately.

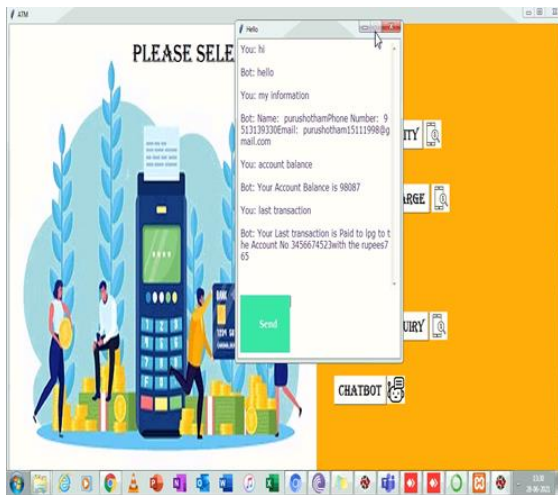


Figure 2. Chat Bot

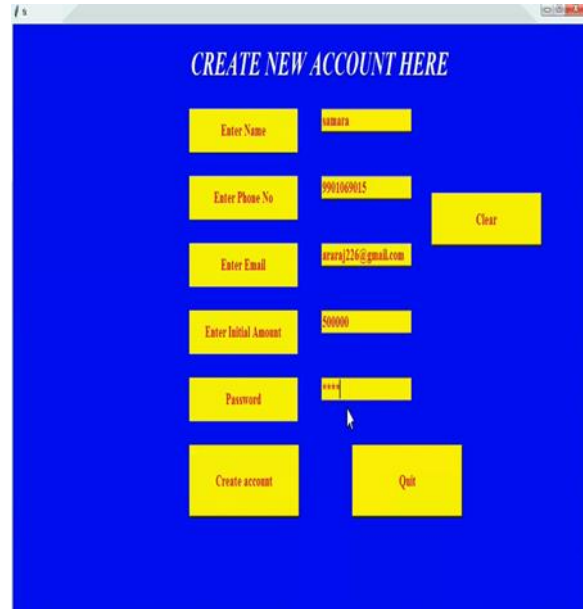


Figure 3. Account Creation



Figure 4. Account Login with OTP

After the Account creation, you will obtain the permission to login into your account with utmost security compliance. You will receive an OTP to login into your portal. This OTP will be received by your registered mobile number.

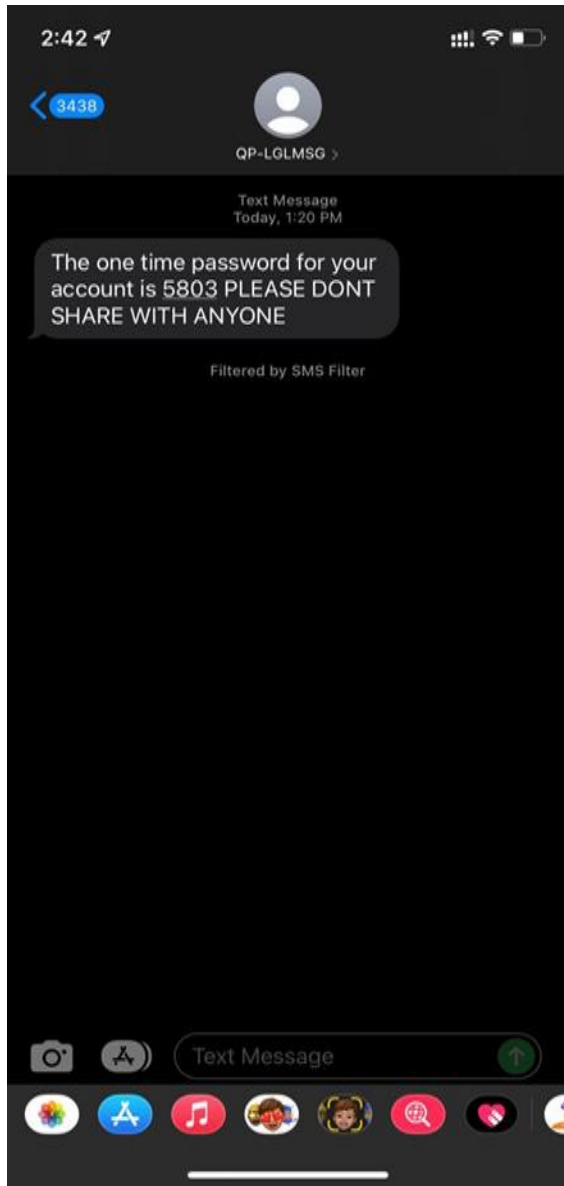


Figure 5. OTP receival



Figure 6. Login with OTP



Figure 7. Transaction page UI



Figure 8. Transaction Completion

## V. FUTURE WORK

Our country has an electronic payment gateway; however, it is not very secure. Security was also missing from the suggested payment system. The implementation of secure electronic transaction procedures secures the suggested architecture. As a result, only genuine clients with sufficient funds in their bank accounts can purchase things from the merchant's website. It is first determined whether the customer is authorized, and then the transaction is completed. The electronic payment gateway is designed safe enough that any authorized customer can put their trust in it and make payments over the Internet without worry or hesitation. Because there is little understanding of electronic transactions in developing countries, considerable backing from the government of that country is essential if this system is to be adopted. Businesses will automate easy payments and allow consumers to pay directly through live chat or Facebook Messenger apps in the future of chatbots. Certain bot features include answering account balance questions, assisting customers with payment alerts, and collecting final payments from customers.

## CONCLUSION

Smart Pay enables shoppers to make purchases in any worldwide market and at any time of day. Users shop online for the convenience of completing a transaction, and as a merchant, you must cater to this inclination. By communicating with your clients, chatbots can help you collect valuable data. This entails learning about their activities, preferences, and difficulties, among other things. Chatbots can be used to provide instant assistance to potential customers. When their problems are remedied quickly, they may take the action you want. This could mean that the software becomes more affable, allowing for more efficient transactions. Unexpected technical failures can cause many hours of outage, which can be frustrating for customers who can't pay directly. These can be moderated immediately by the automated chat box with the correct communication and support tactics.

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