COMP315 – ADVANCED

PROGRAMMING PROJECT

PROPOSAL 2022 GROUP 29

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INTRODUCTION

Online banking, also known as internet banking, home banking or web banking, is an electronic payment system that enables customers of a bank or other financial institution to conduct a range of financial transactions through the financial institution's website. The online banking system will typically connect to or be part of the core banking system operated by a bank to provide customers access to banking services in place of traditional branch banking. Online banking significantly reduces the banks' operating cost by reducing reliance on a branch network and offers greater convenience to customers in time saving in coming to a branch and the convenience of being able to perform banking transactions even when branches are closed. Internet banking provides personal and corporate banking services offering features such as viewing account balances, obtaining statements, checking recent transactions, transferring money between accounts, and making payments "Jake Frankenfied, (2022)".

Online banking makes lives easier. Only a computer, tablet, or smartphone with an internet connection needed to get started. All payments, withdrawals, deposits, and other account information are at a fingertip. Bank account can be accessed in seconds, whether it is lunchtime or midnight. A bank customer can be aware in time of any fraudulent activity if he/she receives a real-time transaction alert. Bank can also be instructed to pay your monthly utility bills, such as electricity, voucher, telephone and mobile, credit card and insurance premiums, on a recurring basis on the bank website. A customer does not even have to remember the due dates; the bank will make sure the payment is made on time month after month. Say goodbye to cheques, long lines, and late fees.

Internet Banking services are a crucial of our daily lives. Making transactions and purchases online have become a fundamental part of our lives. However, to access these services one need to acquire a bank account. Given the on-going pandemic (Corona virus), a processing to visit bank branches has become daunting and difficult, the pandemic limiting the number of customers and staff inside bank branches. Furthermore, ATM services have also been affected as covid-19 restricted large numbers using ATM making difficult for customers without bank accounts to make transaction.
As a result, customers accumulate overdue payments which have dire implications. We are happy to share that customer don't need to visit bank branches to create a bank account anymore, there

are banking website on the internet made for bank customers, adhering to covid-19 regulations. This will allow customers to bank online, making online purchases and payments effectively ensuring that customer's financial activity is not impacted by covid-19.

In the modern world every aspect of our lives has been digitalized, and the advent of covid-19 have pushed banking system to provide online banking services. To tackle these problems, we saw the need to develop "FingerTip". FingerTip is a banking website application that will enable customers to register and acquire a bank account. Once the account has been opened the customer will obtain an immutable virtual card with a card number, expiry date, and a cvv number (security number). The FingerTip will enable the customer to make online purchases, transactions, and buy prepaids online and in-store. Furthermore, the internet banking will allow the customer to set a limit per transaction and stop the card temporally (to make purchases and transactions) at any given time thus ensuring safety in making online purchases as it limits the amount of money the customer spends to the cost of the purchase.

LITERATURE REVIEW

The obvious appeal of the internet banking is the convenience it offers to those who use it. As it uses less data, user friendly and easily accessible (Internet banking is said to be "a bank in your pocket or purse"). Consumers carry their smartphones almost everywhere meaning they will be able to do everyday transactions, anywhere at any time. Limited banking hours and customer care services is slowly becoming a thing of the past as web banking provide customers with the luxury of self-help services at the bank's website which is accessible any time of day.

The types of internet banking services include account Information access which allows customers to view account balances, request account statements, review transactional and account history, keep track of their term deposits, and access investment statements. Furthermore, transactions which include transferring funds, paying third parties, and purchasing prepaid service providers. Investments which enable clients to manage portfolios and review investment portfolios. Support Services which enable clients to check their status of pending requests, follow up and locate ATMs. Finally, the content and news service which provide news related to finance and the latest offers by the bank (CFI Education Inc, 2022).
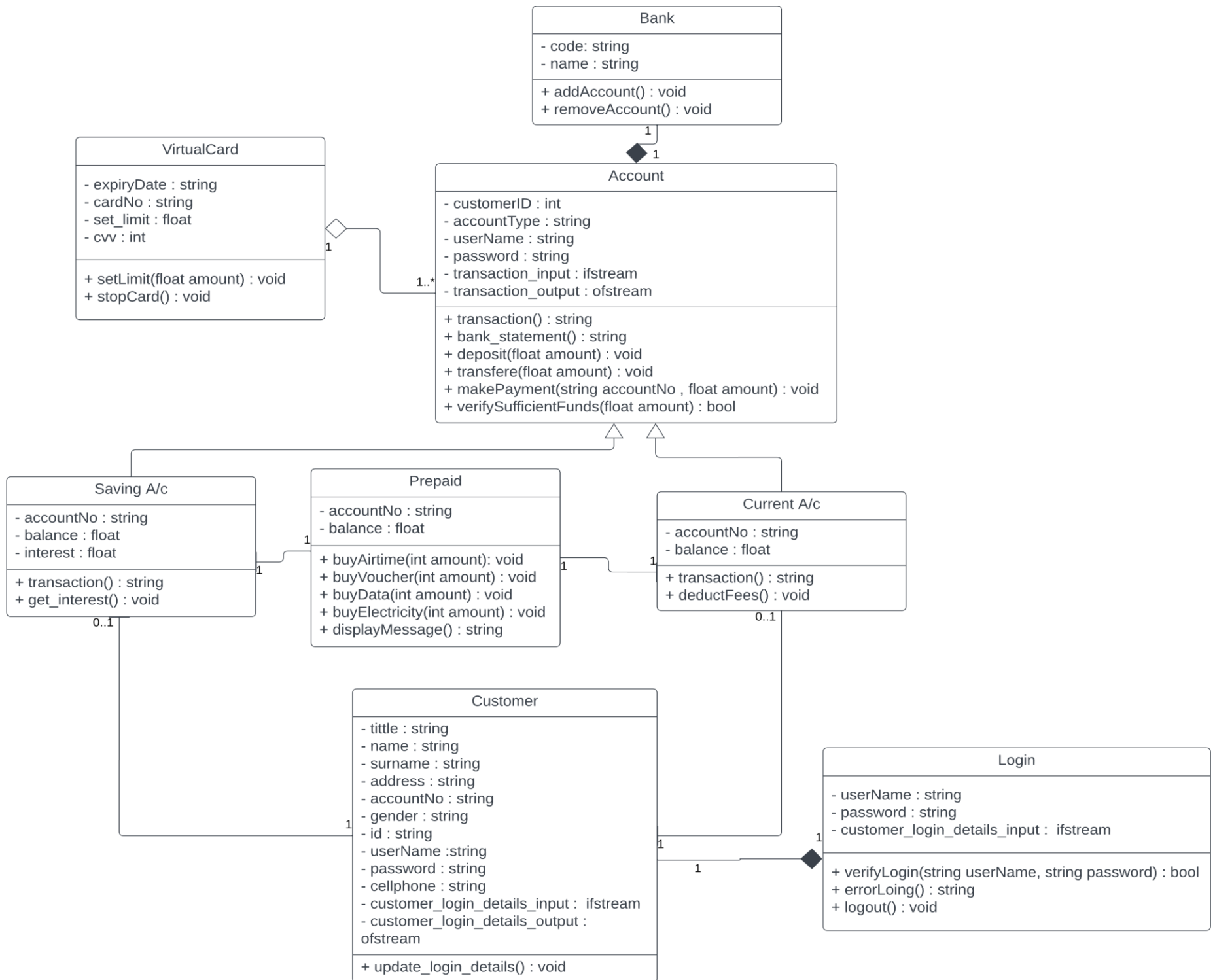
The advantages and disadvantages of an internet banking include (Morgan, 2022):

- Accessing the bank 24/7 – internet banking gives clients the advantage of using bank functions at any part of the day with the exception of maintenance updates and unexpected outages which are inevitable
- Optimizing your money – some banking web alert customers when they try to spend more than they have, they also have added features to help clients save such as Saving Pockets.
- Paying IOUs – it is simple with to pay beneficiaries without the use of cash or cheques.
- Strengthening security – a username and password is required to log onto the banking web which is personal to the owner of the bank account, much like an ATM pin required to withdraw money.

- Providing added controls – apart from making deposits and transactions at any given time, banking web also allow for the activation of debit and credit cards as well as deactivating cards which have been lost or stolen.

Whilst including most functions of existing banking webs, our banking web is going to include an added function of being able to open a bank account on the web itself. With the available banking webs, the client will need to have an existing account to make use of the banking web. Our banking web will allow for account creation and activation and will provide the user with a virtual card from the time the account is created. To acquire a bank account the customer will need to provide personal details, cell phone number, title, name(s), surname, identification number, and address. After the personal details have been entered, the customer will have an option either open a personal (savings) account or a business (current) account. Both accounts can be used for everyday transactions, then after selection of the type of account, the Virtual Card will automatically be activated, like the existing Banking Cards the Virtual Card will have a cvv number (Security Number), Card Number and expiry Date, additionally it comes with a feature that will allow the customer to update their transactional limits every time they want to do instore or online purchases. The client does not have to visit bank branches, as this daunting under covid-19 regulations, just their smartphone is enough to open a bank account. The client is in complete control of their virtual card as they will be able to lock or unlock their phone at any given time. There is instant activation and no waiting period to start using the card.

The banking web will benefit to both customers from rural and urban areas, young and senior citizens, especially people from rural areas since they live far away from the cities. The Covid-19 restrictions made it exhausting for them to travel, as a limited number of people were allowed to commute, and because of social distancing only a few people were allowed to access the banks and sometimes only the fortunate. The "FingerTip" banking web with friendly user graphics which are attractive and simple, making it easy and thrilling to navigate around the web, hence it will be simple for the senior and uneducated customers to use it. The MTN App of the year (AOY) 2022 challenge offers funding to novel internet banking idea, and our web application suits the criteria which is novelty and being transformative. We will therefore obtain funding from the MTN AOY 2022 program for the implementation of the web application.

Bank

- code: string
- name : string

+ addAccount() : void
+ removeAccount() : void

VirtualCard

- expiryDate : string
- cardNo : string
- set_limit : float
- cvv : int

+ setLimit(float amount) : void
+ stopCard() : void

Account

- customerID : int
- accountType : string
- userName : string
- password : string
- transaction_input : ifstream
- transaction_output : ofstream

+ transaction() : string
+ bank_statement() : string
+ deposit(float amount) : void
+ transfere(float amount) : void
+ makePayment(string accountNo , float amount) : void
+ verifySufficientFunds(float amount) : bool

Saving A/c

- accountNo : string
- balance : float
- interest : float

+ transaction() : string
+ get_interest() : void

Prepaid

- accountNo : string
- balance : float

+ buyAirtime(int amount): void
+ buyVoucher(int amount) : void
+ buyData(int amount) : void
+ buyElectricity(int amount) : void
+ displayMessage() : string

Current A/c

- accountNo : string
- balance : float

+ transaction() : string
+ deductFees() : void

Customer

- tittle : string
- name : string
- surname : string
- address : string
- accountNo : string
- gender : string
- id : string
- userName :string
- password : string
- cellphone : string
- customer_login_details_input : ifstream
- customer_login_details_output : ofstream

+ update_login_details() : void

Login

- userName : string
- password : string
- customer_login_details_input : ifstream

+ verifyLogin(string userName, string password) : bool
+ errorLoing() : string
+ logout() : void

OBJECTIVES

- The objectives of internet banking system involve reducing congestion at banks and ensuring fast access funds or loan from anywhere without visiting the bank branch.
- By internet banking system we aim to protects customers from attacks when traveling to banking institutions to deposit or withdraw their saved funds.
- To design an internet banking web that has high security, that is username and password protected, by that way we are confident that only the real owners can login on their internet bank account.
- To design a create an account window, where you will write your personal details to be verified by the Bank, types of account you want to create (saving or current) account, and the initial deposit.
- To include a virtual card that is stored on the banking system and can be used to pay contactless in store or online, has its own unique card number, expiry date and cvv.
- To see you bank balance, transfer cash, or make a payment on you existing account any time you want to on your internet banking system.
- To buy prepaid like airtime, voucher, data and even electricity any time you want to on your internet banking system, using your funds.
- To have a system that you can log-out to when you are done using it, and to be used again you will have to login using your username and password, and get verified by the bank if it corrects, that way we are ensuring high security.

Hence the application further developed can enable users to:

- Add new bank account
- Update an existing account
- stop bank account
- List recent 10 transactions
- Show details of a single transaction
    .

Methodology

- The banking web will be coded using the C++ programming language through the Code Blocks integrated development environment. Code Blocks allows users to use their compelling and wide selection of graphical user interface features and options.

- Collection frameworks, various coding techniques, classes – built-in classes and created classes, libraries – standard libraries and additional libraries will be used when required at different parts of developing the banking web application to ensure an effective, efficient and safe banking web application.

- Code Blocks will allow us to create a user-friendly banking web application which meets all the objectives stated as well as an interface that is aesthetically pleasing.

- The features of the banking web application Account class allow for customers to complete transactions, make deposits and transfer money.

- The customer details will be stored on a text file and will be accessed through the Customer class. With this the application will be able to validate login details of a returning customer and store the details of new customers.

- New customers can choose for their account to either be a Savings account or Current account, each of which have respective classes.

- The virtual card details will be displayed on screen and will be accessed through the VirtualCard class. With this class, customers will be able to make use of the virtual card, they can set a limit for their card with the use of the Set_limit attribute and they can stop the card at any given time for any given reason.

- Customers will be able to make a prepaid purchases using the Prepaid class. From the customer's available balance, they will be able to purchase airtime, vouchers, data, and electricity. After making use of this feature a message will be displayed such as "Voucher pin sent to mobile number" to ensure a successful purchase and the amount purchased will be deducted from the customer's balance. "Insufficient funds" will be displayed should the customer try to make a purchase that costs more than the available balance in the customer's account.

Conclusion

This proposal discusses the design elements of a banking web application that will allow people to open bank accounts at the touch of a button. A thorough discussion of the objectives and methodology took place. Following that, the project design was illustrated using the applications class diagram (UML) to demonstrate its functionality.

In this case, the web application is called FingerTip, and it is a banking web application. Using Code Blocks as the integrated development environment and C++ programming techniques will allow us to take advantage of the powerful graphical user interface features, allowing us to develop an application that makes the process of opening banking accounts much simpler. The web application will be highly interactive and simple to operate.

The design of the web application will be innovative and adapted to the needs of all clients (citizens of legal age), and you will be able to open a bank account on the application and receive a virtual card within minutes of doing so. Also available to users will be the ability to make payments online or in-store by simply changing the transactional limit and proceeding with the transaction. The graphics of the web application will also differ because it would cater to a variety of various types of citizens.

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