

DIGITAL WALLET

(Electronic Financial Transaction System)

MD MAHBUBUL ISLAM
Student Id: 012131024

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in
The Department
of
Computer Science and Engineering



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Approval Certificate

This project titled "**Digital Wallet (Electronic Financial Transaction System)**" submitted by **Md Mahbubul Islam**, Student ID: **012131024**, has been accepted as Satisfactory in fulfillment of the requirement for the degree of Master of Science in Computer Science and Engineering on 27th February 2018.

Board of Examiners

1.

Suman Ahmmed
Assistant Professor - CSE

Supervisor

2.

Mohammad Mamun Elahi
Assistant Professor - CSE

Examiner

3.

Mohammad Nurul Huda
Professor & Coordinator - MSCSE

Ex-Officio

Declaration

This is to certify that the work entitled “**Digital Wallet (Electronic Financial Transaction System)**” is the outcome of the research carried out by me under the supervision of Suman Ahmmed, Asst. Professor.

Md Mahbubul Islam
ID: 012131024
Dept. of MSCSE

In my capacity as supervisor of the candidate’s project, I certify that the above statements are true to the best of my knowledge.

Suman Ahmmed
Asst. Professor, CSE

Abstract

Main goal of this project is reduce the transaction of physical cash. Cash transaction open the door of money Laundering. Money laundering is harmful for countries economy. Without banking transactions, no transaction is traceable. Traditional banking only forty hours per week, But people need use their money 24/7. Huge numbers of hard cash transaction are happening every day. If we can make all transactions traceable, 24/7 withdraw or deposit with banks, any time send money to others or anytime can pay all bills our life will be very fast and government can earn more revenue. Especially ecommerce need transfer money digitally. Our Digital Wallet system can make those possible.

Acknowledgement

With the blessing of almighty Allah, this project is become completed. It was impossible to done without help of my honorable project advisor Asst. Professor Suman Ahmmed. A special thanks to my wife for the steadfast support and encouragement.

I also owe my special thanks:

To my honorable professor and MSC coordinator Mr. Nurul Huda.

To Ayesha Akter for her guide and help.

The company who helped me with business scope and domain knowledge. Without business case and domain knowledge technology was nothing.

I feel honored as a student of United International University. And grateful to the authority to giving us this opportunity.

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Chapter 1

1 Introduction

1.1 Background

Cash transaction open the door of money Laundering. Money laundering is harmful for countries economy. The transaction of hard cash is always risky. And, today is rising time of e-commerce in our country. Payments needed to be secure, first and legal. To serve the issues we need a system. This wallet will solve all the complexity. All transactions will be legal, auditable, faster and secure. No need to carry hard cash. Life will be easy.

1.2 Aims and Objectives

- Cashless Trading
 - No need to carry Hard Cash
 - Pay anywhere by digital payment
 - Send money digitally to anyone
 - Can also request money to others
- Bring Peoples Under Secure Transaction
 - All transaction can be monitor
 - No money laundering is possible
- Reduce Risk
 - Robbery is not possible
 - Every transaction will authenticate by owner

1.2 Deliverables

To reach the goal bellows need to deliver:

- A website, by that user can register. No matter where the user is. Only needed internet with a device that can browse website.
- Web API. Independent apps can use or implement the services.
- Transaction engine, to connect with multiple banks by routing and make the transaction ISO 8583 message format.
- Admin site to approve client and business accounts. Day closing process also done by this site.
- Schemas of database.

Chapter 2

2 Literature Review

Typical financial transaction is register volume book. Now most of the banks in Bangladesh bring their banking under digital banking system. They allow online banking and set ATM (Automatic Teller Machine) network. Government also established NPSB (National Payment Switch Bangladesh). With NPSB inter banking become very faster and easy. After getting approval of Bangladesh bank with a settlement bank we can connect NPSB. A secure and dedicated channel will pass the encrypted data.

2.1 Payment Getaway

Payment gateway is a door for acquire bank and issuer bank

2.2 E-commerce

Online marketplace, It can be Business to Business (B2B), Business to Customer (B2C). Customer can purchase the product over the web and payment by VISA/Master/JDC cards.

2.3 Payment Switch

The Financial Switch drives all the industry standard front-end devices such as ATMs, Point of Sale (POS) devices for processing of Debit, Credit and Smart cards, cash-in systems, and provides transaction authorization by connecting to Core Banking systems of different banks, interchanges and co-networks. Typically, a financial switch is an electronic payment software for driving ATM terminals, transaction switching, card management and interfacing to National Financial Switch and financial switches of other banks. The Financial Switch also integrates with new generation payment channels, such as internet payment gateway and mobile payment systems. As such the Financial Switch is a must have solution for a payment solutions provider.

2.4 Scan & Payment

2.4.1 What is Scan and Pay?

It is a mobile-based payment facility that enables fund transfer by scanning a quick response (QR) code using an app which supports this feature. It can be used for making payments at merchant outlets, e-commerce websites and grocery stores, among others.

2.4.2 Does it work?

Customers simply need to scan the QR code and enter the transaction amount. The amount gets transferred directly from the bank account without the need of a swiping machine. It eliminates the need of entering the merchant's ID or phone number to make payments. For those using mobile banking apps for scan and pay, the app acts like a virtual debit card that can be used online or offline.

2.4 ISO8583 financial transaction message format

Usually, a card initiated transaction travels from a point-of-sale terminal (POS) or an automated teller machine (ATM), using a series of networks to the card issuer entity for authorization against the card holder's account. The transaction data contains information from the card (PAN, expiry date), from the terminal (transaction number, merchant data) and information added dynamically during the process and by the intervening systems. The card issuer entity will authorize or decline the transaction and generate a response message which must be delivered back to the POS or ATM within a predefined time period (usual this period is 30 sec).

In this chain of systems from the terminal (POS or ATM) to the card issuer entity and back usually is used ISO 8583 message format. Although ISO 8583 defines a common standard, different systems may use the fields in different ways because only some fields are standards fields and the meaning is the same for all systems. Some of the fields are generic and can be used by each entity in a custom way.

There are few versions of the ISO 8583 standard: ISO 8583:1987, ISO 8583:1993, ISO 8583:2003. 1987 and 1993 versions are very similar and version 2003 is very different and was created to be more generic. In this tutorial, I will concentrate on ISO 8583:1987 versions, as is still the most widely used. The main idea is the same for all versions. The differences are on field's levels and meanings.

Chapter 3

Methodology

3 System Concept, Design and Implementation

3.1 Requirement analysis Define Domain

Study several national and international Payment getaways, wallet and online banking services.

Like: PayPal, Skrill, PayTM

3.1.1 Stake Holders

- Customer Wallet
 - Wants to buy something from a merchant on the Internet or on counter
 - Withdraw From BA or Deposit to BA
 - Transfer to money to another customer wallet
- Business Wallet
 - Sells goods/services via a Web site or on Counter
 - Withdraw From BA or Deposit to BA
- Bank
 - Issues withdraw
 - responsible for the payment of the dept. of the cardholders
- Payment gateway
 - Interact between wallet to wallet and wallet to bank.

3.1.2 Define Domain

- Wallet to Wallet:
 - Client Wallet:
 - Fund Transfer
 - Payments
 - Request for Money

- Business Wallet:
 - Fund Transfer
 - Receive the Payments
- Bank/Cards to Wallet to Bank/Cards
 - Add Bank Account (BA) or Credit/Debit (CC/DC)Cards
 - Add Money TO Wallet From BA/CC/DC
 - Withdraw Money From Wallet to BA/CC/DC
- E-Commerce
 - Client Wallet User Can Pay By Wallet or Linked BA/CC/DC To Registered Merchant's Business Wallet

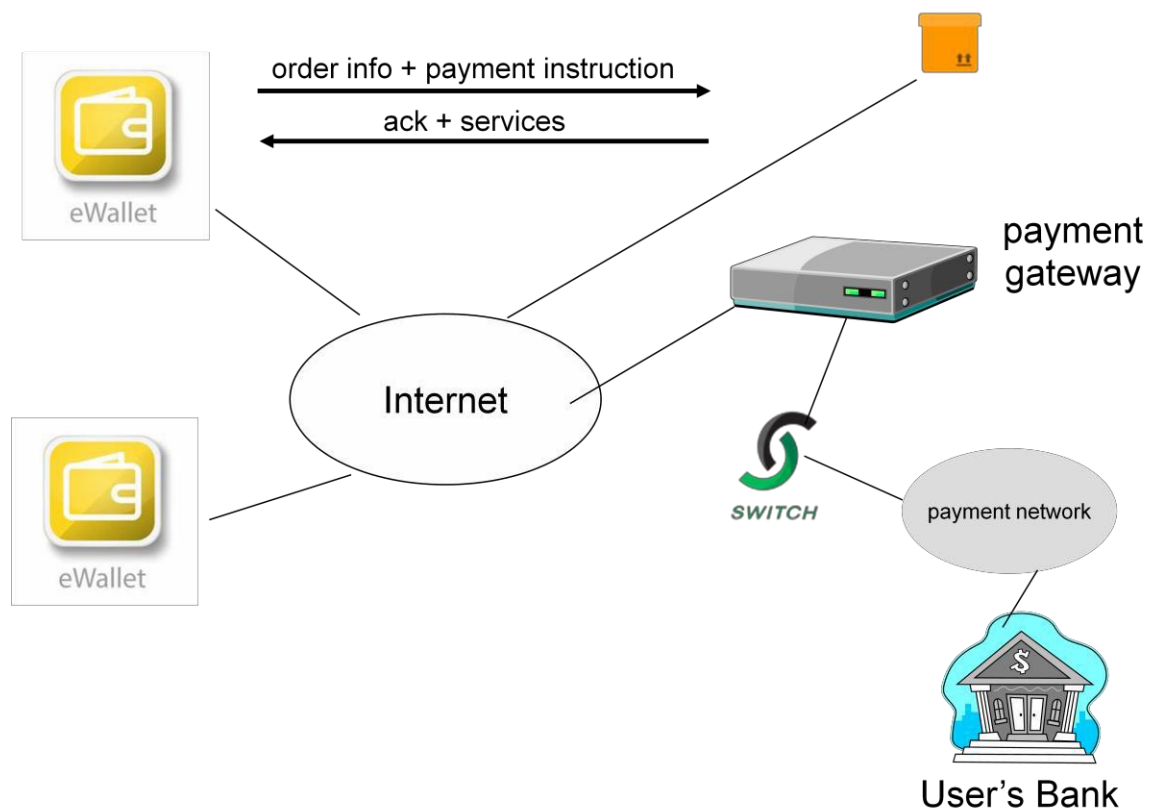


Fig 3. 1 (Model)

3.2 2 Technology Selection

- **Domain driven design**
 - There is Client, Common, Security, Transaction, Report, Biller Domain.
- **Secure card holder data**
 - Card or bank account data is encrypted
 - Key is store to other secure location
- **Multilayer Architecture**
 - DAL, Model, BLL, Transaction Core
 - API, Web
- **Secure Transaction**
 - Every transaction is tokenized.
 - responsible for the payment of the dept. of the cardholders
- **Technologies**
 - MS SQL Server 2016
 - Dot net 4.6.1
 - C#

3.3 Activity Diagram

3.3.1 Activity Fund Transfer or Payment

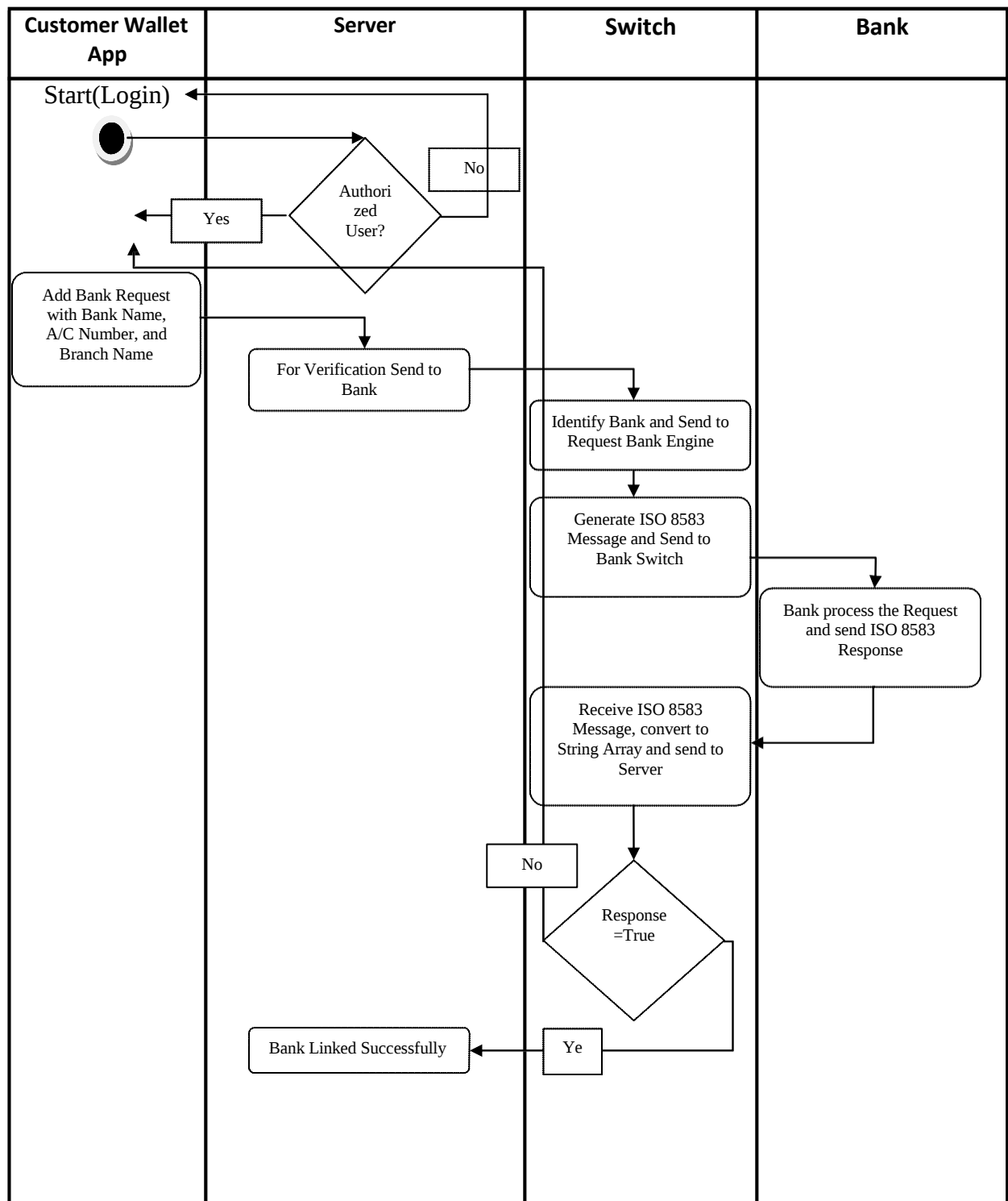


Fig 3. 2 (Activity Fund Transfer or Payment)

3.3.2 Activity Add Bank Account

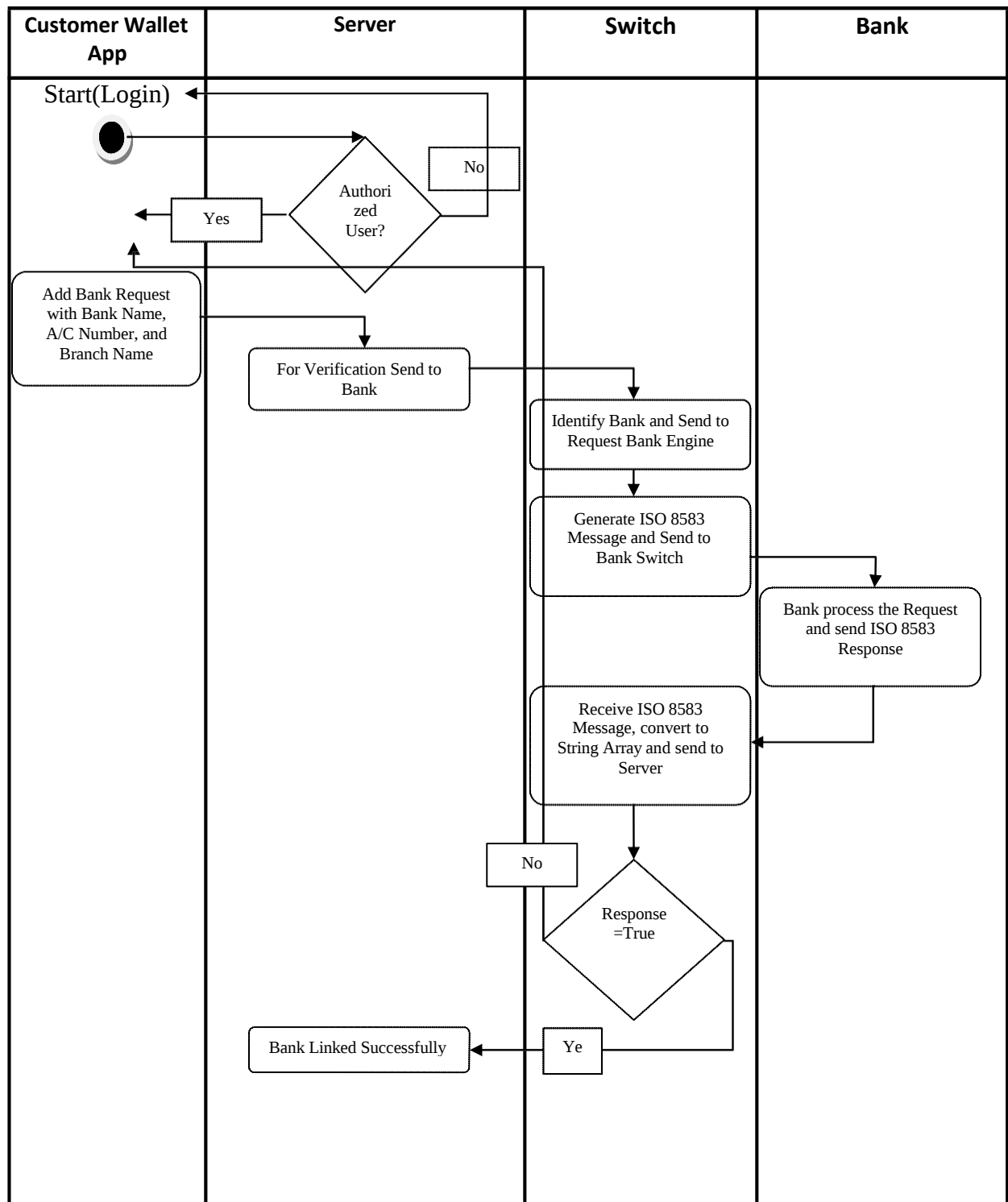


Fig 3. 3 (Activity Add Bank Account)

3.3.3 Activity Add Money from Bank Account to Wallet

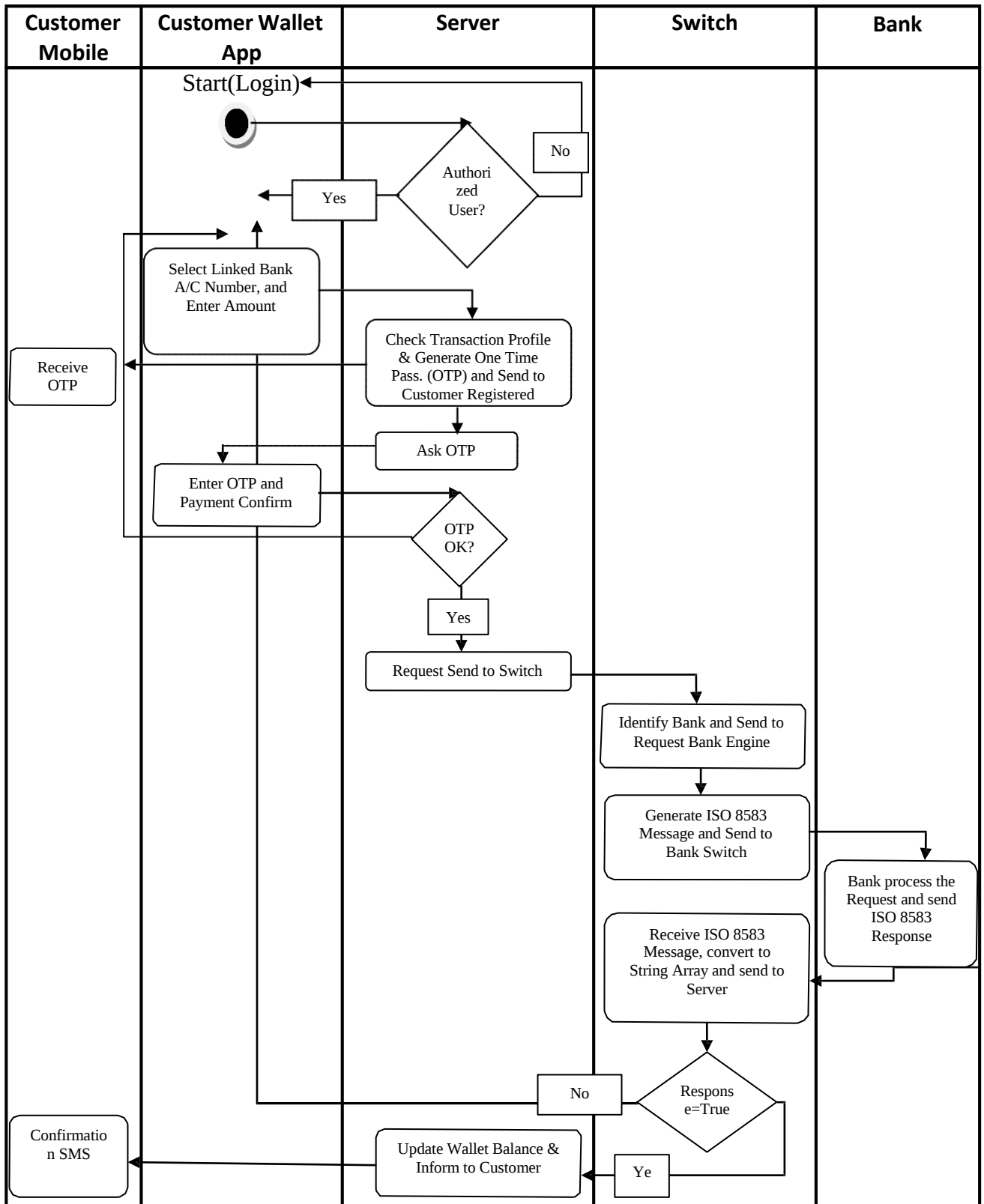


Fig 3. 4 Activity Add Money from Bank Account to Wallet

3.4 APP Design

3.4.1 Profile Basic Info

Need enter some information for maintaining the wallet

- Basic Information
- Billing Information
- Photo Id and Documents
- Security Question and Password Reset

Welcome Mr. Ovi Bhuiyan
Primary Email : ovibhuiyan43@gmail.com
Primary Phone : +8801674008943

Basic Information

Name:	Mr. Ovi Bhuiyan
Gender:	Male
Date of Birth:	01/01/2018
Father's Name:	father
Mother's Name:	mother
Occupation:	Student
Registration Date :	21/01/2018 01:25 PM

Basic Info

Billing Address

Email & Mobile

Photo & Document's

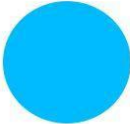
Security & Login

Activity Log

Fig 3. 5 (Profile Basic Info)

3.4.2 Activity Log

User Can See the Activities



Welcome Mr. Ovi Bhuiyan

Primary Email : ovi**bhuiyan**43@gmail.com

Primary Phone : +8801674008943

✔ Basic Info

✔ Billing Address

✔ Email & Mobile

✔ Photo & Document's

✔ Security & Login

Activity Log

Activity Log

Date

2018/02/02

to

2018/03/02

SUBMIT

Display

Activity Type	Action	Datetime
Login	CustomerLogin	02/03/2018 04:00 PM
Login	Login	02/03/2018 04:00 PM
Login	CustomerLogin	02/03/2018 01:55 AM
Login	Login	02/03/2018 01:55 AM
Balance Inquiry	ShowBankAmountDetails	02/03/2018 01:45 AM
Balance Inquiry	ShowBankAmountDetails	02/03/2018 01:42 AM
Login	CustomerLogin	02/03/2018 01:42 AM
Login	Login	02/03/2018 01:42 AM
Balance Inquiry	ShowBankAmountDetails	02/03/2018 01:28 AM
Login	Login	02/03/2018 01:27 AM

1 2 3 4 5 6 7 8 9 10 ...

10 items per page

1 - 10 of 325 items

Fig 3. 6 (Activity Log)

3.4.3 Dashboard

After successful registration and admin approval, customer user will see the dashboard.

In dashboard, Profile picture, wallet balance, registered mobile number and email is showed. Here user will find all the functional links.

- Statements
 - All The Transactions In/Out Can Find in Any Date Range
 - Any Bank to Wallet
 - Wallet to any Bank A/C

The dashboard is divided into several sections:

- Profile Section:** A blue circular profile picture placeholder. Below it, the text reads: "Welcome Mr. Ovi Bhuiyan", "Primary Email : ovibhuiyan43@gmail.com", and "Primary Phone : +8801674008943".
- CashBaba Balance:** A box showing the current balance as "BDT: 59,961.45/-".
- Transaction History:** A table listing recent transactions. Each entry includes a timestamp, a description, and the amount.
- Mobile Recharge:** A section for recharging a mobile phone. It includes radio buttons for "Prepaid" (selected) and "Postpaid". It has input fields for "Mobile Number" (with a country code dropdown set to "+88" and a number field "01XXXXXXX"), "Operator" (with a "Select Operator" dropdown), and "Amount" (with a "BDT" dropdown and a "Type Amount" text field). A "PROCEED TO PAYMENT" button is at the bottom.
- Functional Links:** A vertical list of links on the left side: "Add Money", "Withdraw from Wallet", "Add Bank/Debit/Credit Card", "Transfer Money", "Virtual Cash", "Request Money", "Statement", and "Fee Pay".
- View More:** A link at the bottom right of the transaction history section.

Timestamp	Description	Amount
02/03/2018 01:45 AM	Balance Check payment	BDT 5/-
26/02/2018 01:30 PM	Balance Check payment	BDT 5/-
26/02/2018 01:28 PM	Balance Check payment	BDT 5/-
26/02/2018 01:28 PM	Balance Check payment	BDT 5/-
26/02/2018 01:24 PM	Balance Check payment	BDT 5/-

Fig 3. 7 (Dashboard)

3.4.4 Add BA/CC/DC

Link your account

- Link any Bank Account to Wallet
- Link Credit Card (Visa, Master, Amex, Nexus) to Wallet

The screenshot displays the Janata Bank mobile application interface. On the left, a user profile section for 'Mr. Ovi Bhuiyan' includes contact details and a 'CashBaba Balance' of BDT: 59,941.45/-. Below this is a menu with options like 'Add Money', 'Withdraw from Wallet', and 'Add Bank/Debit/Credit Card'. The main area is divided into two sections: 'Bank Account' and 'Debit or Credit Card'. The 'Bank Account' section, titled 'LINK BANK', shows three Janata Bank Limited Savings Accounts with masked card numbers (7000, 1000, and 8000). Each account has 'Make Primary', 'Unlink', and 'BALANCE INQUIRY' buttons. A fourth account with card number 0717 is shown as 'No approved' with 'Resend Verify Amount' and 'VERIFY ACCOUNT' buttons. The 'Debit or Credit Card' section, titled 'LINK CREDIT OR DEBIT CARD', states that no credit card is currently linked and provides a 'Click Here' link to add one.

Welcome Mr. Ovi Bhuiyan
Primary Email : ovibhuiyan43@gmail.com
Primary Phone : +8801674008943

CashBaba Balance
BDT: 59,941.45/-

- Add Money
- Withdraw from Wallet
- Add Bank/Debit/Credit Card
- Transfer Money
- Virtual Cash
- Request Money
- Statement
- Fee Pay

Bank Account LINK BANK

Janata Bank Limited
Savings Account
*****7000
[Make Primary](#) [Unlink](#)
BALANCE INQUIRY

Janata Bank Limited
Savings Account
*****1000
[Make Primary](#) [Unlink](#)
BALANCE INQUIRY

Janata Bank Limited
Savings Account
*****8000
[Make Primary](#) [Unlink](#)
BALANCE INQUIRY

Janata Bank Limited
Savings Account
*****0717
[No approved](#)
[Resend Verify Amount](#)
VERIFY ACCOUNT

Debit or Credit Card LINK CREDIT OR DEBIT CARD

You have not linked any Credit Card. [Click Here](#) to add your Credit Card.

Fig 3. 8 (Add BA/CC/DC)

3.4.5 Add Money to Wallet from BA/CC/DC

Add Money

- Add Money from any Bank Account
- Add Money from Credit Card (Visa, Master, Amex, Nexus)

Welcome Mr. Ovi Bhuiyan
Primary Email : ovibhuiyan43@gmail.com
Primary Phone : +8801674008943

CashBaba Balance
BDT: 60,941.45/-

- Add Money
- Withdraw from Wallet
- Add Bank/Debit/Credit Card
- Transfer Money
- Virtual Cash
- Request Money
- Statement
- Fee Pay

Add Money Over The Counter Payment

Mode: Bank Account

Account: Savings-JANB(*****8000)

Amount: 1000

☒ I completely agree to accept CashBaba's [terms](#), [Data Policy](#), [Cookie use](#), [Privacy policy](#), [terms of service](#), [terms of Add Money](#).

☒ I acknowledge that CashBaba Do not charge any amount for Add Money. Yours Bank or Credit/Debit Card issuer may charge Transaction fee as per terms and conditions with your account or card. Please call CashBaba Customer Service for further information

ADD

TopUP Transaction History

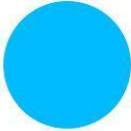
02/03/2018 04:15 PM	Balance load in wallet 7100000841103341	RECEIVED	BDT 1000.00/-
04/02/2018 04:57 PM	Balance load in wallet 7100000671164914	RECEIVED	BDT 2588.00/-
21/01/2018 06:11 PM	Balance load in wallet 7100000246399152	RECEIVED	BDT 1250.00/-

Fig 3. 9 (Add Money to Wallet From BA/CC/DC)

3.4.6 Withdraw Money from Wallet to BA/CC/DC

Withdraw Money

- Withdraw Money through Bank Account
- Withdraw Money through Debit/Credit Card



Welcome Mr. Ovi Bhuiyan
Primary Email : ovibhuiyan43@gmail.com
Primary Phone : +8801674008943

CashBaba Balance

BDT: 60,941.45/-

- Add Money
- Withdraw from Wallet
- Add Bank/Debit/Credit Card
- Transfer Money
- Virtual Cash
- Request Money
- Statement
- Fee Pay

Withdraw from Wallet

Mode: Bank Account

Account: Savings-JANB(*****1000)

Amount: 3200

☒ I completely agree to accept CashBaba's [terms](#), [Data Policy](#), [Cookie use](#), [Privacy policy](#), [terms of service](#), [terms of Withdraw](#).

☒ I acknowledge that CashBaba Do not charge any amount for Withdraw Money. Yours Bank or CreditCard issuer may charge Transaction fee as per terms and conditions with your Account or Card. Please call CashBaba Customer Service for further information

SUBMIT

Withdraw Transaction History

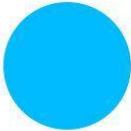
18/02/2018 08:05 PM	Cash Withdrawal 4000001422550944	PAYMENT	4.00/-
18/02/2018 08:04 PM	Cash Withdrawal 4000001317079113	PAYMENT	9.00/-
18/02/2018 07:25 PM	Cash Withdrawal 4000001254311219	PAYMENT	2.00/-

Fig 3. 10 (Withdraw Money From Wallet To BA/CC/DC)

3.4.7 Transfer Money to another Customer Wallet

Fund Transfer

- Wallet to Wallet
- Any Bank to Wallet
- Wallet to any Bank A/C
- Credit Card to Wallet



Welcome Mr. Ovi Bhuiyan
Primary Email : oviibhuiyan43@gmail.com
Primary Phone : +8801674008943

CashBaba Balance
BDT: 60,941.45/-

- Add Money
- Withdraw from Wallet
- Add Bank/Debit/Credit Card
- Transfer Money
- Virtual Cash
- Request Money
- Statement
- Fee Pay

Wallet to Wallet Money Transfer

You can Transfer Money to any Beneficiary with your CashBaba account. ✕

☒ Mobile

+88 01781223344

Account Name: Akiqur Rahman Choudhury
Primary Email: chad@r-cis.com
Primary Phone: +8801781223344

2000.00

eee

SEND MONEY

Wallet to Wallet Transaction History

19/02/2018 02:07 PM	Fund Transfer 4000000188649285	RECEIVED	BDT 1313.00/-
18/02/2018 08:11 PM	Fund Transfer 4000001571094271	RECEIVED	BDT 20.00/-

Fig 3. 11 (Transfer Money to another Customer Wallet)

3.4.8 Request Money to another Customer Wallet

Request Money

- Customer wallet holder can request to another customer wallet for balance.
- Send request by mobile number or email address.

Welcome Mr. Ovi Bhuiyan
Primary Email : ovibhuiyan43@gmail.com
Primary Phone : +8801674008943

CashBaba Balance
BDT: 60,941.45/-

- Add Money
- Withdraw from Wallet
- Add Bank/Debit/Credit Card
- Transfer Money
- Virtual Cash
- Request Money
- Statement
- Fee Pay

Request Money

Type a valid Mobile Number or Email Address to send a Request for Money to another CashBaba Personal User.

☒ Mobile ☐ Email

+88 01714116111

Account Name : Arif Hossain
Primary Email : arif@r-cis.com
Primary Phone : +8801714116111

2000

Purpose of Transaction

REQUEST MONEY

Request Received

Date	Customer Name	Customer Mobile Number	Request Amount	Action
------	---------------	------------------------	----------------	--------

Request Sent

Fig 3. 12 (Request Money to another Customer Wallet)

3.4.9 Generate Virtual Cash (VC)

Virtual Cash

- User can generate a 6 digit number for any amount
- Virtual cash number can be merchant specific or non specific
- When virtual cash is merchant specific then only that merchant can consume that VC.
- This 6 digit number represent that amount

Welcome Mr. Ovi Bhuiyan
Primary Email : ovibhuiyan43@gmail.com
Primary Phone : +8801674008943

CashBaba Balance
BDT: 60,941.45/-

- Add Money
- Withdraw from Wallet
- Add Bank/Debit/Credit Card
- Transfer Money
- Virtual Cash
- Request Money
- Statement
- Fee Pay

Generate Virtual Cash

Merchant Specific ? ☒

Select Merchant

Amount

☒ I completely agree to accept CashBaba's [terms](#), [Data Policy](#), [Cookie use](#), [Privacy policy](#), [terms of service](#), [terms of Virtual Cash Generation](#).

☒ I acknowledge that CashBaba Do not charge any amount for Virtual Cash Generation. Yours Bank or CreditCard issuer may charge Transaction fee as per terms and conditions with your account or card. Please call CashBaba Customer Service for further information

SUBMIT

Pending Virtual Cash List

Date	Transaction Id	Type	A/C Number	A/C Status	Amount	Action

Fig 3. 13 (Generate Virtual Cash)

3.5 Schema and Tables

3.5.1 Tables of Common Schema

Schema Name	Table Name
[Common]	[ConstantValue]
[Common]	[DocumentTypeSetup]
[Common]	[BusinessWiseDocumentMapping]
[Common]	[TransactionStatus]
[Common]	[Activity]
[Common]	[BusinessCategory]
[Common]	[ClientServiceInformation]
[Common]	[City]
[Common]	[CommunicationType]
[Common]	[ConstantValue_Audit]
[Common]	[Country]
[Common]	[TransactionType]
[Common]	[Currency]
[Common]	[Designation]
[Common]	[InternationalPhoneCode]
[Common]	[MerchantCategory]
[Common]	[State]
[Common]	[ContactUsPageEmail]
[Common]	[ApplicationMessage]
[Common]	[UserWiseDocumentStorageURL]

Table: 3. 1 Common Schema

3.5.2 Tables of Security Schema

Schema Name	Table Name
[Security]	[PersonalInformation_Audit]
[Security]	[UserInformation]
[Security]	[UserInformation_Audit]
[Security]	[UserPINInformation]
[Security]	[UserPINInformation_Audit]
[Security]	[PersonalInformation]
[Security]	[OldPasswordInformation]
[Security]	[APIRole]
[Security]	[Menu]
[Security]	[Page]
[Security]	[PasswordQuesAndAns]
[Security]	[PasswordQuestion]
[Security]	[Role]
[Security]	[RoleWiseMenu]

Table: 3. 2 Security

3.5.3 Tables of Client Schema

Schema Name	Table Name
[Client]	[Merchant_Audit]
[Client]	[CustomerIssueRenewFeeBreakdown]
[Client]	[Institution]
[Client]	[InstitutionUser]
[Client]	[Merchant]
[Client]	[Bank]
[Client]	[ClientTeansactionFeeSlab]
[Client]	[SPAnonymousCustomerPolicy]
[Client]	[ClientTransactionDashBoardInformation]
[Client]	[MerchantBankInfo]
[Client]	[Customer_Audit]
[Client]	[Bank_Audit]
[Client]	[SPAnonymousMerchantPolicy]
[Client]	[Biller]
[Client]	[BankReportConfiguration]
[Client]	[BranchOfBank]
[Client]	[ClientTeansactionFeeProfile]
[Client]	[CustomerBankInfo]
[Client]	[SPAnonymousBillerPolicy]
[Client]	[BankWiseClientPolicy]
[Client]	[Customer]
[Client]	[ClientTransactionTypeInfoInformation]
[Client]	[_ClientTeansactionFeeProfile]
[Client]	[RequestCashBabaBalanceToAnotherCustomer]
[Client]	[BillProduct]
[Client]	[BillerProduct]
[Client]	[MerchantItems]
[Client]	[ClientCashAndMoneyRequest]

Table: 3. 3 Client Schema

3.5.3 Tables of Transaction Schema

Schema Name	Table Name
[Transaction]	[TransactionInformation]
[Transaction]	[TransactionFeeSettlementInformation]
[Transaction]	[ClientFeePolicyMapping]
[Transaction]	[TransactionFeeSlabPolicy]
[Transaction]	[DayClosingInformation]
[Transaction]	[Dispute]
[Transaction]	[TransactionFeePolicy]
[Transaction]	[TransactionSettlementInformation]
[Transaction]	[MerchantSettlementInformation]
[Transaction]	[TransactionFeeDistributionForStakeHolders]
[Transaction]	[StakeHolderInformation]
[Transaction]	[PasscodeIssuingInformation]
[Transaction]	[TransactionBatchInformation]
[Transaction]	[TransactionFeeInformation]
[Transaction]	[RecurringPayment]
[Transaction]	[ClientBeneficiaryList]
[Transaction]	[TransactionSecondaryAuthenticationInformation]
[Transaction]	[AdminDashboardReport]
[Transaction]	[TransactionSTANInformation]

Table: 3. 4 Transaction

3.5.3 Tables of Report Schema

Schema Name	Table Name
[Report]	[BankDashBoardInfo]
[Report]	[ClientDashBoardInfo]

Table: 3. 5 Report

3.6 Define infrastructure

The infrastructure has to be more secure and recoverable.

- Bellow infrastructure should be double and two different location
 - One is Data Centre (DC)
 - Another one is Disaster Recovery (DR)
 - Up Time Maximum Two to Five Munities.
 - The Load Should Be Balanced Between DR & DC

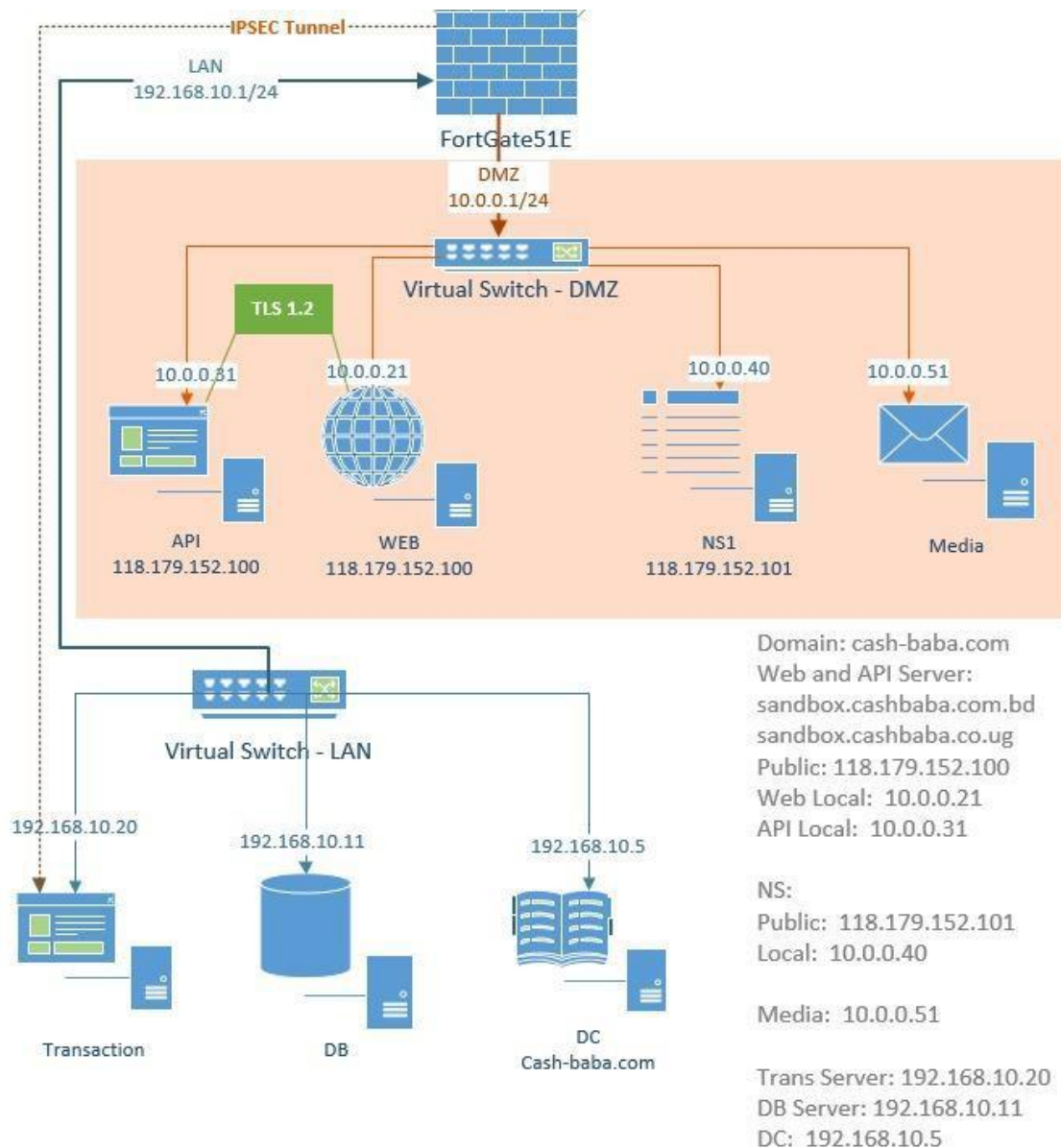


Fig 3. 14 (Define infrastructure)

Chapter 4

Results

The result is as expected:

- Bank Simulate was smooth
- Connectivity test with bank by WCF and Socket
- After day closing process
 - All transaction is settled
 - Merchant or Business wallet balance successfully update
 - Fee distribution amount is correct
- Server response rate is varied due to pick time. But no time out.
- Low data exchange
- All transaction can traceable
- If any transaction become poisons, system automatically generate reversal.

Chapter 5

Conclusion

The goal of develop this product to introduce in Bangladesh. And bring every one under Banking channel.

Our next plane to develop Android and IOS Apps. Apps will connect Web API.

This system will make all personal banking easy and faster. Wallet will open 24/7 Banking for all users.

References

I find some wallet and payment gateway listed below. Few I have used and for others did detail study.

1) Airtel Money:

With the Airtel Money app, users can easily recharge prepaid accounts or pay postpaid bills. You can also shop online if your digital wallet has cash loaded in it. It's also extremely safe as every transaction or payment you make requires a secret 4-digit mPin.

2) Citi MasterPass:

Citi MasterPass, a free digital wallet, helps make checking out while online shopping a speedier process. Once you've stored all your payment and shipping details in your Citi Wallet, simply click on the MasterPass button and it will take care of the rest.

3) Citrus Pay:

Citrus Pay, one of the top e-wallets in India, it offers a Citrus wallet for customers as well as payment solutions to businesses. With a strong base of 800 million customers, it has definitely earned its spot as one of the best mobile wallets in India.

4) Ezetap:

Ezetap, a Bangalore based digital payment solution founded in 2011, offers business owners solutions to accept card payments via electronic devices. It also send customers e-receipts through an SMS or email.

5) Freecharge:

Freecharge, one of the most famous names right now when it comes to digital payment in India, has been known to target the youth in all their promotions. With equivalent amount of coupons given for every recharge you make, it's a great option to save while paying your bills online.

6) ICICI Pockets:

While you might find a Pocket card redundant, considering you're opting for an e-wallet app to avoid using a card, they do have a pretty neat wallet app. Its VISA powered and can be used on any Indian website, or to transfer money to email ids, WhatsApp contacts, and also just tap and pay your friends easily.

Some others references are given below.

1. Skrill. Site URL - <https://www.skrill.com/en/>
2. PayPal. Site URL - <https://www.paypal.com/>
3. Upay. Site URL - <https://www.upaybd.com/>
4. PayTM. Site URL - <https://paytm.com/>
5. VISA. Site URL - <https://www.visa.com/globalgateway/>
6. Master. Site URL - <https://www.mastercard.com/gateway.html>
7. GPay. Site URL - <https://www.grameenphone.com/personal/financial-services/gpay>
8. JusPay. Site URL - <https://juspay.in/>

Appendix A

Virtual Cash (VC): Virtual Cash is six digit number form cash.

Payment Getaway: Payment getaway is a door for acquire bank and issuer bank

E-Commerce: Is an online market place, where people can buy/sell their product or service. And payment should digitally.

Fund transfer: made sending and receiving money quick and easy. On the top of that, users have variant options to transfer money from wallet to wallet to bank to wallet or vice versa.