



Design and Implementation of Electronic Payment Gateway

Software Project-2

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Declaration

We declare that this project is our original work and has not been submitted in any form for another degree or diploma at any university or other institute of tertiary education. Information derived from the published and unpublished work of others has been acknowledged in the text and a list of references is given.

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Abstract

E-commerce refers to online transactions where consumers can buy goods and products and businesses can advertise. E-commerce platforms were remarkably established in this contemporary era. Most service providers now carry out their work online. People from all over the world worked hard to finish their interment tasks. For this reason, e-commerce and other payment services are established enables for payment gateway services. The majority of payment gateways guarantee security, privacy of merchant and customer data, and develop into dependable third-party payment gateways. A user-friendly financial transaction was established using web services and browser payment gateway. The purpose of this report is to create a secure payment gateway system using internet protocols. whereby retailers can incorporate a payment gateway system into their online stores. After visiting and purchasing goods from an online store, a customer can pay using this software, concealing all of their personal information while the merchant receives payment securely. In order to complete their payments, this payment gateway software ensures efficient, hassle-free, and most secure gateways. In this paper described payment gateway and its design. This paper implies impact of payment gateway and impact in this modern online age. Payment gateway security mechanism and describes API and security.

KEYWORDS: electronic payment gateway, e-commerce security, online payment System, plugin, database

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Chapter 1: Introduction

1.1. Introduction to E-commerce System

E-commerce is the stage of buying and selling products, goods, foods, and other items online. E-commerce continues to gain popularity day after day. Customers can now order and buy their essential goods online and receive them as services from their homes. There is no time wastage, hassle, or unsafe method here. Its business philosophy, viewpoint, and customer service are what make it popular. By utilizing user-friendly online services, business opportunities are increased-commerce established technological advancement. People all over the world turn in E-commerce for buy their daily necessary things and this turn over day by day e-commerce is increased. Now in this digital era It also creates a competitive environment. Throw connected internet and browser any one can visit e-commerce website from anywhere by mobile phone, laptop, tab etc. ways. With increasing E-commerce many payment service providers also established to pay products price throw internet. E-commerce is capable to integrate payment gateways, payment service providers. E-commerce have its own deliver systems. New technology's creates new implement environments that helps to create e-commerce sites easier. Day after day E-commerce keeps its daily importance to people's daily needs and move upward its business opportunities and technology's.

1.2. Introduction to E-Payment Gateway

The electronic payment gateway is where payment services certify that they are maintaining certain standards and security measures when using internet services. a transactional payment gateway that is frequently used in e-commerce. The security mechanism and protected card information are enabled and maintained by a payment gateway. Secure payment gateways prevent unauthorized networks from operating and make browsers safer. For online applications, the payment method must be private and safe in addition to the bank server, e-commerce software, and server. Our proposal proposes a novel method for securely authenticating electronic payment gateways. When a client provides a merchant with their bank account number, password, or other personal information, there are many opportunities for hackers to steal that data and post it online. As a result, creating a payment gateway is advantageous and essential instead of providing information to the business. Design and execution of an electronic payment are the goals of this work. Payment gateway uses interface programming language to interact with server site and e-commerce site integration. Payment gateway implemented by some Security protocols that encrypted data transmit customer to payment gateway to server sites and keep secured card information. Payment gateway provides merchant options to withdraw money in easiest way. In this project we describe about our implemented payment gateway. Our payment gateway is for integrated with e-commerce websites, merchant can register and customer can be complete their payment by this payment gateway.

Chapter 2: Background Study

2.1 SSL COMMERZ

SSL COMMERZ is a payment gateway service provider in Bangladesh. SSL COMMERZ provide their plugin interface that can be integrate in e-commerce websites. It takes short time to integrate plugin in e-commerce. SSL COMMERZ accepts quick transactions in online service with minimum documentation's SSL COMMERZ is licensed by Bangladesh Bank. SSL COMMERZ offers customer payments method including debit/credit cards. SSL COMMERZ transacts real time data in its dashboard to perform business decisions. Throw SSL COMMERZ payment gateway customer can complete their payment task along with e-commerce. SSL COMMERZ process payment method then store their account. SSL COMMERZ provides merchant registration certificate and then merchant can withdraw money. SSL COMMERZ is OTP based secured gateway and provide custom theme. s SSL COMMERZ is made by PCI DSS and ISO:27001 security protocol. SSL COMMERZ provide sixteen-digit token to secured card numbers. Token is generated by randomly. For un authorized access SSL COMMERZ provides SSL/TSL certificates and provides security that unauthorized person can't access sensitive data throw internet. SSL COMMERZ have dedicated fraud tracking and prevention team. SSL COMMERZ also provide sandbox system.

2.2 iPay Bangladesh

iPay Bangladesh is payment solution in Bangladesh. iPay Bangladesh provides a secure system for daily transactions for their customers. iPay Bangladesh can be used in mobile phone and computer and can perform transactions using internet. By using iPay Bangladesh can transfer money, can pay utilities bill, and other cashless services. iPay Bangladesh have some business policy that its user needs to maintain. Customer can pay their bill but in a limited number of amounts. iPay Bangladesh provide its payment gateway API for their merchant. Merchant get payment URL from iPay Bangladesh to the web browser then iPay Bangladesh process payment methods. iPay Bangladesh provides sand box environment for developer to feel real iPay Bangladesh payment gateway system.

Chapter 3: Methodology

3.1 Tools Used:

To develop this project, we have used the following tools:

- XAMMP Apache server
- Notepad++
- PHP
- JavaScript
- Bootstrap
- jQuery
- HTML
- CSS

Operating System: Microsoft Windows XP

PHP:

PHP stands for Hypertext Pre-processor. PHP is a potential and powerful language for implementing a dynamic, well designed website. PHP is a server side language and also a scripted language. In backend development PHP is widely used. PHP can connect with a database to store, recover, rearrange code and information. PHP is elementary and initially used for developing dynamic web pages. PHP is best for authorization and build management system, and E-commerce websites. PHP is less cost, proficient and most useful for developing any modern web apps and websites. For complex web development issues PHP is one of the best solutions. In our payment-gateway web application we used PHP for creating our dynamic web pages. We create and connect with a database and insert our data in it and store. We also can easily interact and use different frames in our website.

JavaScript:

JavaScript is a widely used programming language for its lightweight, and in time compiled programming functions. JavaScript is popular as a scripting language. This programming language is used for front end design and creating a responsive website. JavaScript can create and construct run time objects and it supports object-oriented concepts; it also serves prototype functions. In our implementation we used JavaScript for creating our responsive web pages. It creates our webpages more responsive and attractive.

Bootstrap:

Bootstrap is a popular framework. Bootstrap is the most useable framework for its open source resource and easy free use. Bootstrap is a CSS framework and widely used for front end development. Creating a website with Bootstrap is a standard framework; it creates more attractive web pages. Bootstrap has a large number of built-in functions and this function can easily drag and drop to make a dynamic webpage. For the implemented payment gateway we used some Bootstrap code for more attractive web pages. We also used some built-in functions.

HTML:

HTML stands for Hyper Text Mark-up Language. HTML tags are used for building blocks websites. HTML performs display data to a web browser. HTML builds the structure of the webpages. HTML has thousands of tags. For displaying data in a web browser an HTML tag is designed. For implementation of a payment gateway HTML code is used multiple times.

CSS:

CSS language is used for presenting web pages in different layout, color and different fonts. CSS makes a webpage attractive, responsive and more reliable. In our project we used CSS for creating multiple web pages. It makes a good presentation of payment gateway web pages.

Notepad ++

Notepad is an open source tools for code editors. It is popular for Microsoft windows. Notepad comfort and supports different programming language. Notepad supports most of the library functions, syntaxes and object-oriented approaches. For our implementing Payment gateway software, we used Notepad ++. We edited codes and compile our code and get desired output at web browser.

3.2 Jira Project Management Software

Jira is one of the popular project management tools to maintain software development life cycle. Jira consist of different project management template. Using Jira project management tools can customize work flows, can track project work condition, can update work schedule, can collaborate with team members. To implement payment Gateway software, we used Jira tools for maintain our project. We create project then issue, work schedules and track our project and collaborate with our team members. We needed to create Jira account and add our members to it.

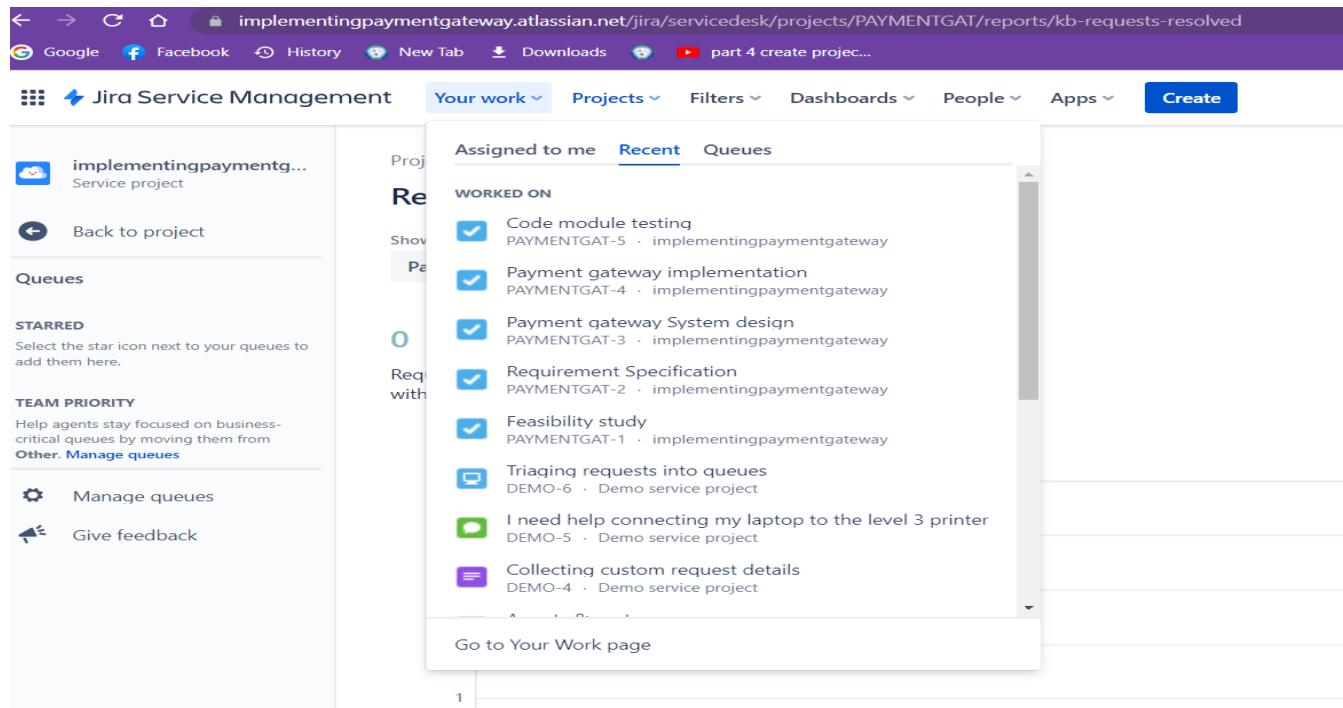


Figure 1: Jira project Management tools

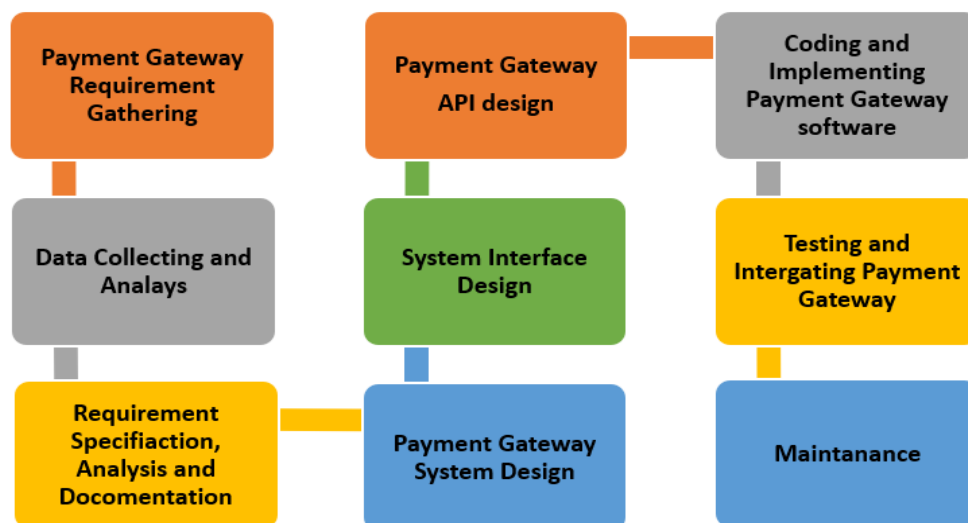
3.3 Waterfall model

The waterfall model is a classical sequential model used for breakdown of software development life cycle into different phases. Because of most of the software development life cycle

used waterfall model this model is popular and simple to approach. Waterfall model divides different stages of development cycle. This model follows after completing one stage then start development next stage or next portion. For implementing payment gateway, we followed waterfall model.

- Before implementing payment gateway, we gather knowledge about payment gateway. After gathering knowledge, we analysed it would be financially and technically easy to develop or not.
- After collecting data, we analysed how to implement the payment gateway. What would be the procedure, method, what tools we would use. We research and analyse data from various resources.
- At third stage we specified requirements in various portions, what would be necessary requirements, what portion would be more focuses. We specified who would be stakeholders. What would be cost and time for implementing payment gateway.
- Text Stage we designed the system what would be its feature. We designed payment gateway interface. We designed code module and model, view, controller and document all design.
- After completing all design part, we started implement our payment Gateway. We code different module. We compile and run code module. Solve Error we founded.

After completing one module of code we test that portion in testing tools. After completing all the modules of code, we test whole payment gateway that is technically worked or not. After implement we integrate payment gateway with e-commerce websites.



3.4 PCI CSS Protocol

Payment card security is from of PCI CSS protocols. PIC CSS security protocol is used to secure and defend payment card and its transaction systems. Widely most of the payment card is formed by this protocol security systems. This security system is built for all company who is worked with payment card service like store payment card data, transact card data and information. PCI certification is established for secured sensitive data and information. It encrypted data and make secured data server transformation. PCI is formed by four layers and all individual layers performs individual tasks. PCI DSS made by twelve security requirements that handle card information by part in part. By sending unique id, anti-virus system, firewall configuration, system password mechanism create card secured manner and secured protocol system.

3.5 Rest API

Application Programming Interface (API) is a set of software interface that connects different computer programs by transferring information and data. API is a software program's preferred method of communication. To transfer specifications and feature extraction between two software programs, API code and mechanisms are used. A protocol program called Representational State Transfer (Rest) constructs application programming interface. Data is moved around and client and server connection are established via the Rest API. The Rest API maintains data security and uses encryption. When data passed via the software systems, the browser was secured, the network was protected from unlawful activity, and the programs were insured. For more secure systems in our project, we'll use Rest API. The majority of the program makes sure API security. Programs are protected from specific security risks and flaws thanks to API security, which is provided. API security guarantees the safety of the transport layers. When an API transforms data, API security makes data, messages, and a secure communication program available. We'll employ conventional API security measures in our system.

Chapter 4: Payment Gateway System Design

4.1 Plugin Interface

Payment gateway plugin interface. After checkout from E-commerce customer get these interface and get payment service provider option, Bkash, Nagad and Rocket. Card payment service also available in this interface

Card payment: For card payment customer need to fill his card number, card validation month, and CVC number.

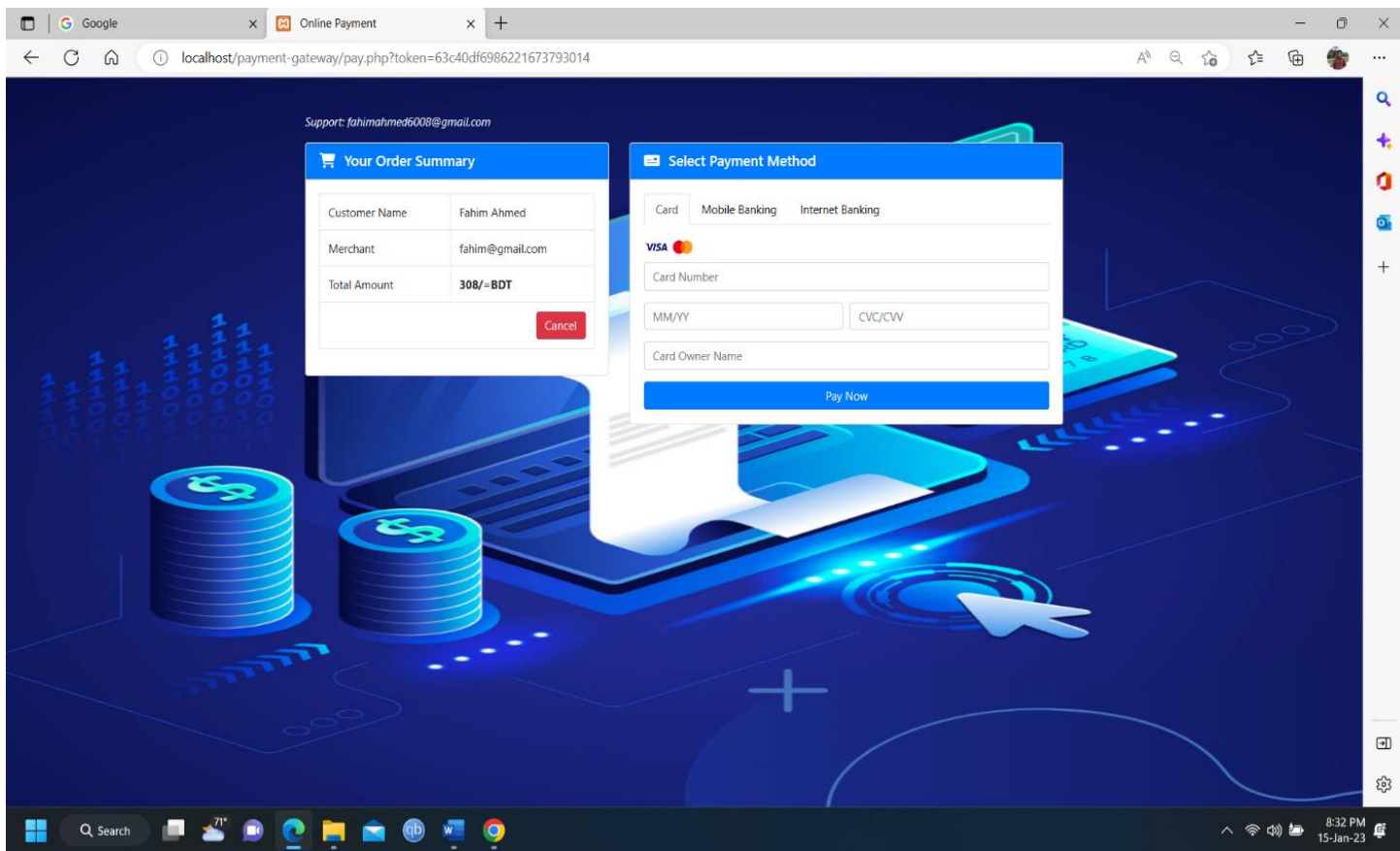


Figure 1.1: Payment gateway plugin interface

Mobile Banking: For payment using Mobile banking customer need to fill Bkash, Nagad or Rocket number and password to confirm payment.

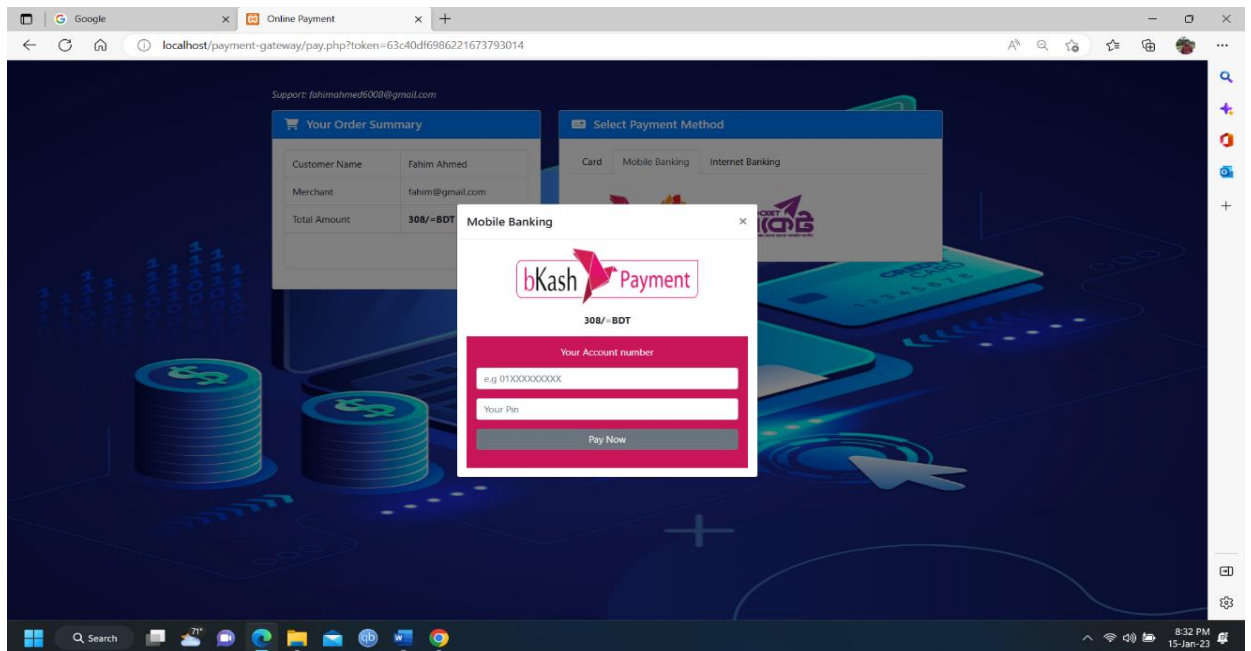


Figure 1.2: Payment gateway mobile banking interface (Bkash)

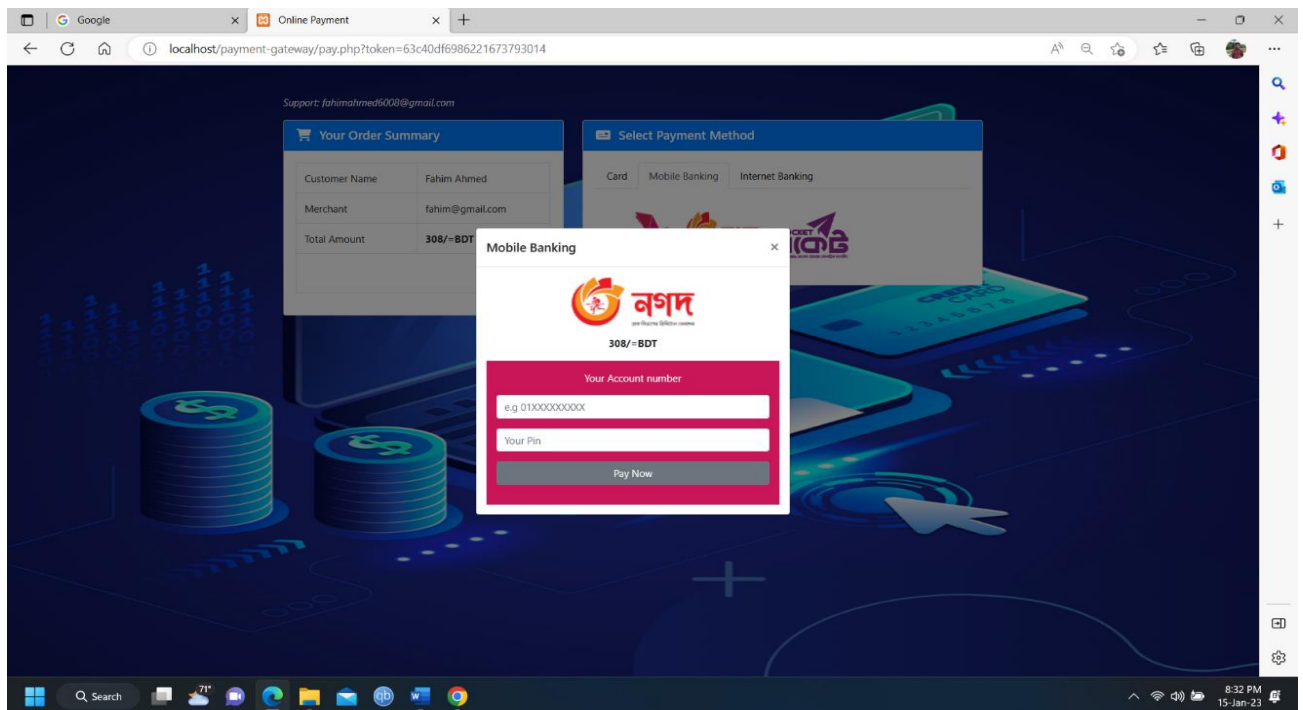


Figure 1.3: Payment gateway mobile banking interface (Nagad)

Internet Banking:

For payment using internet banking customer first need to fill Customer Bank account number and Branch Name.

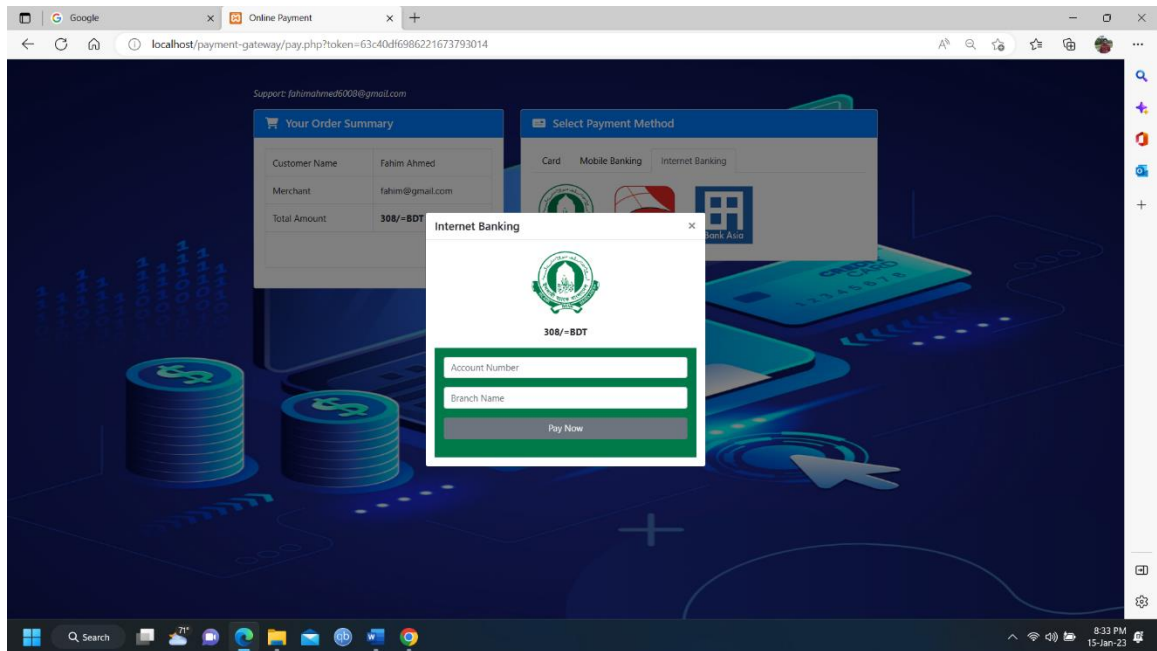


Figure 1.4: Payment gateway internet banking interface (Islami Bank)

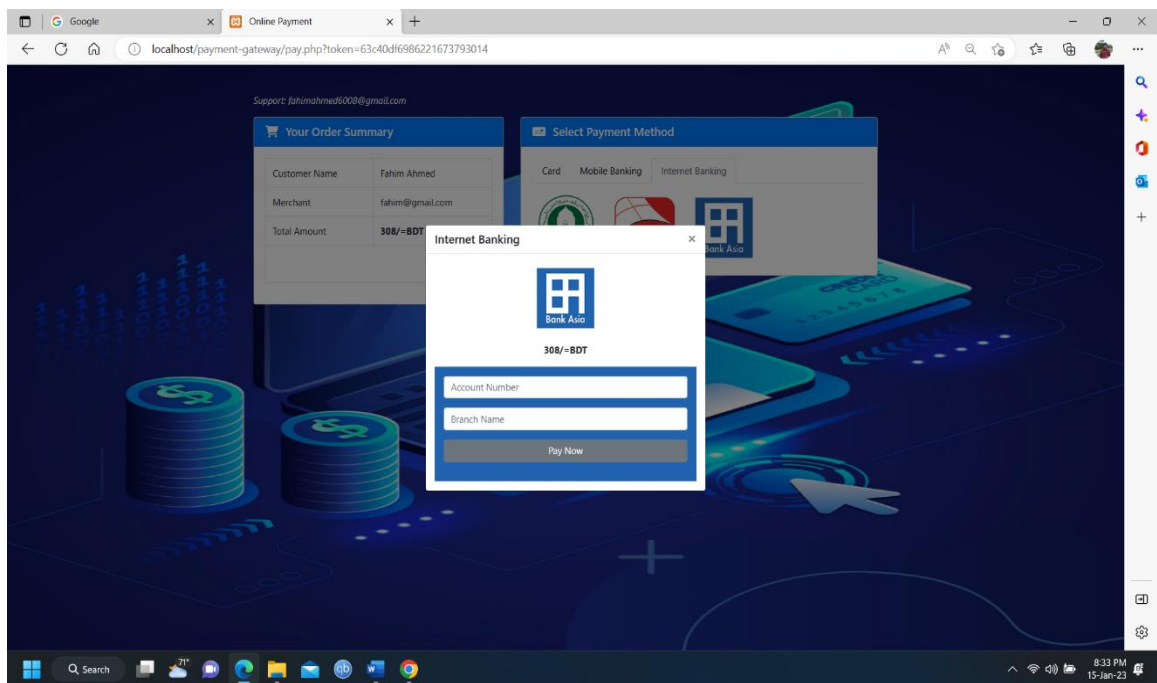


Figure 1.5: Payment gateway internet banking interface (CityBank)

Payment Gateway Plugin Success Face: After payment customer will get success payment gateway notification page. Customer can view to confirm his name, amount, Transaction id. Then can back to E-commerce websites for more order.

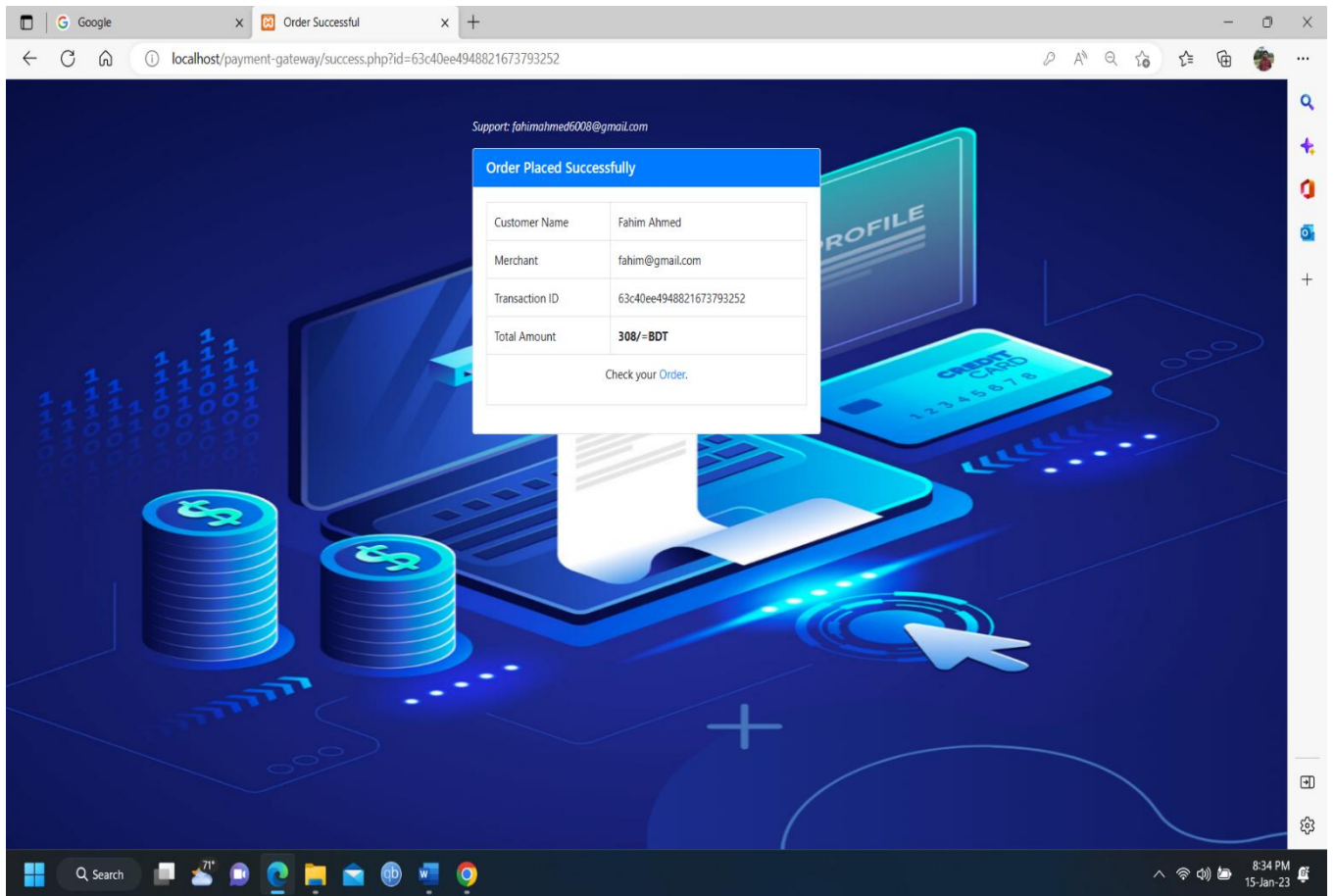


Figure 1.6: Payment gateway success message interface

4.2 Payment Gateway website page

For transaction history and withdraw money Merchant first of all need to login. Merchant need to fill his register email and password after registration in merchant account.

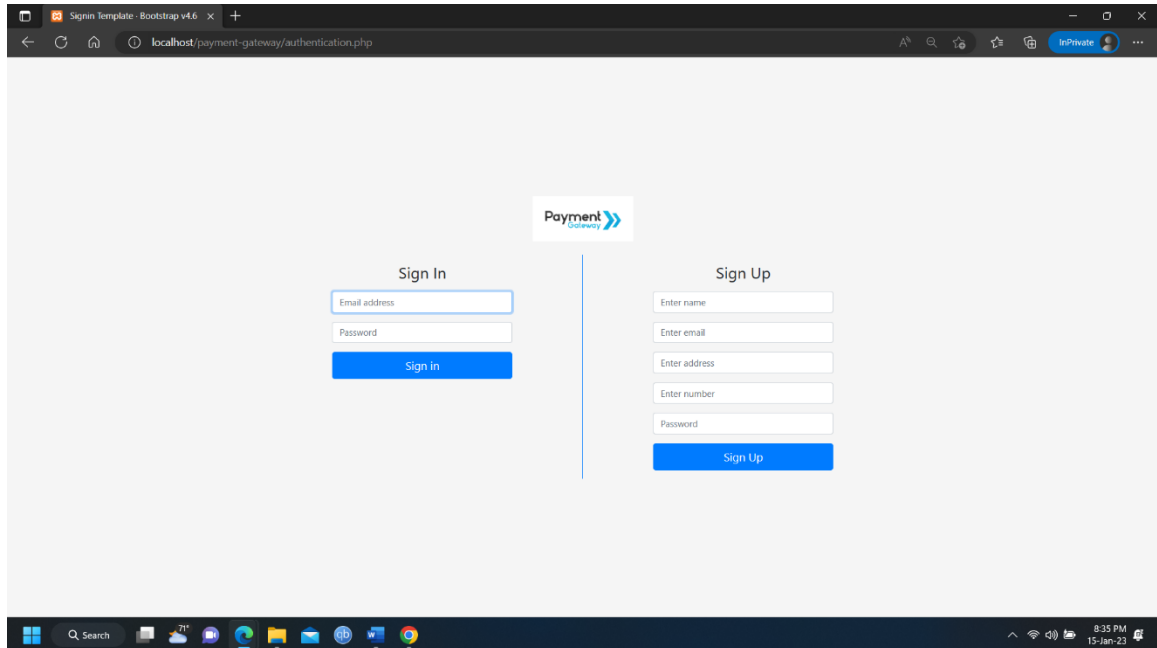


Figure 2: Payment gateway website page interface (sign in, login)

Before withdraw interface:

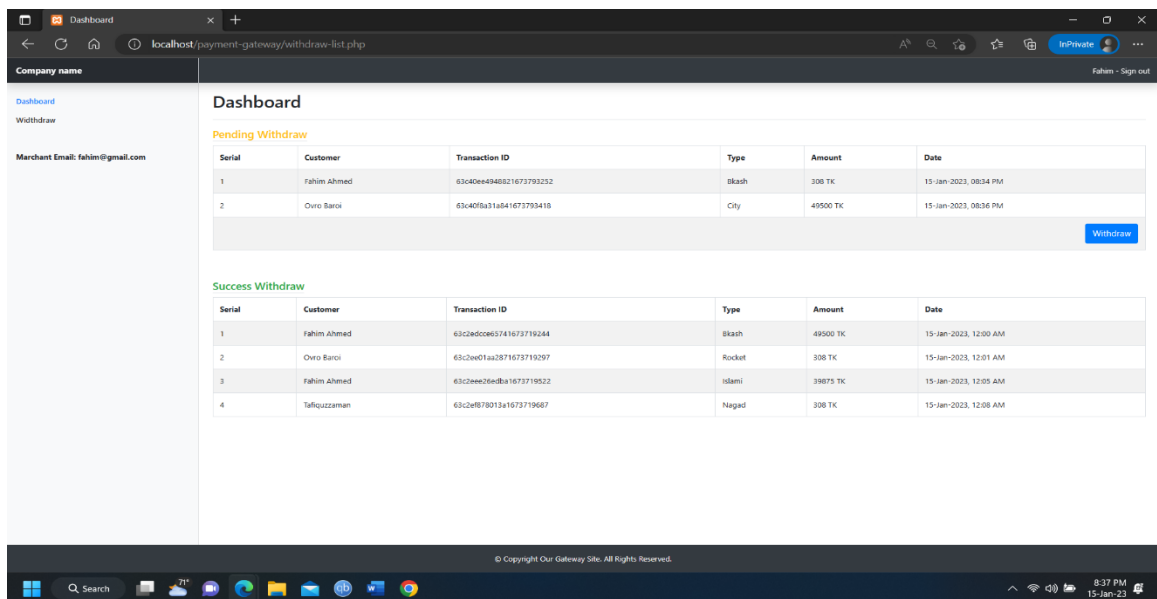


Figure 2.1: Payment gateway transaction page interface

Withdraw Method: For withdraw money from Payment gateway website merchant need to provide his Mobile banking number or internet banking account number.

Company name

Dashboard

Withdraw

Merchant Email: fahim@gmail.com

Withdraw

Amount - 49808

Select Withdraw Type:

Bkash Islami Bank

Your Account number

01323510028

Withdraw

Withdraw List

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8:37 PM 15-Jan-23

Figure 2.3: Payment gateway withdraw page Interface.

After Withdraw interface:

Company name

Dashboard

Withdraw

Merchant Email: fahim@gmail.com

Dashboard

Pending Withdraw

Serial	Customer	Transaction ID	Type	Amount	Date
No data found!					

Success Withdraw

Serial	Customer	Transaction ID	Type	Amount	Date
1	Fahim Ahmed	63c2edce05741673719244	Bkash	49500 TK	15-Jan-2023, 12:00 AM
2	Ovoro Barci	63c2ee01aa2871673719297	Rocket	308 TK	15-Jan-2023, 12:01 AM
3	Fahim Ahmed	63c2ee26edba1673719522	Islami	39875 TK	15-Jan-2023, 12:05 AM
4	Tafiquzzaman	63c2e878013a1673719687	Nagad	308 TK	15-Jan-2023, 12:08 AM
5	Fahim Ahmed	63c2de494862167373252	Bkash	308 TK	15-Jan-2023, 08:34 PM
6	Ovoro Barci	63c20f8a31a841673739418	City	49500 TK	15-Jan-2023, 08:36 PM

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8:37 PM 15-Jan-23

Figure 2.4: Payment gateway after withdraw page interface

4.3 E-commerce Website

To check implementation Payment Gateway, we also build E-commerce websites. Customer can order their product from this website. In this E-commerce websites customer need to sign up and login to complete product order.

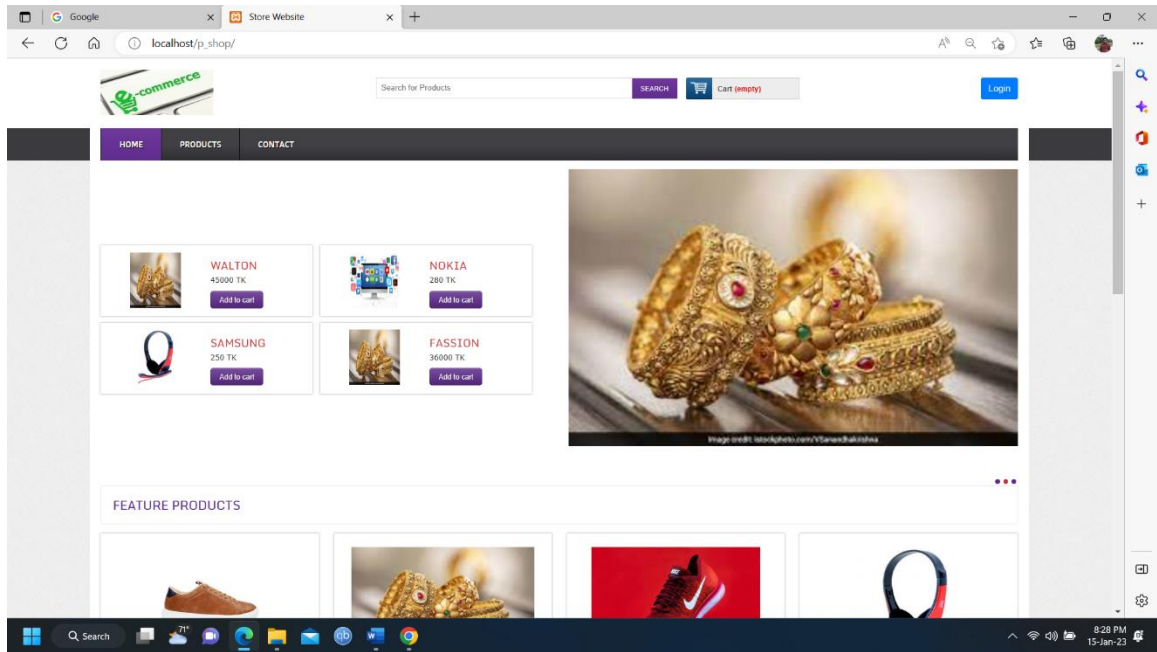


Figure 3: E-commerce page interface

Product page:

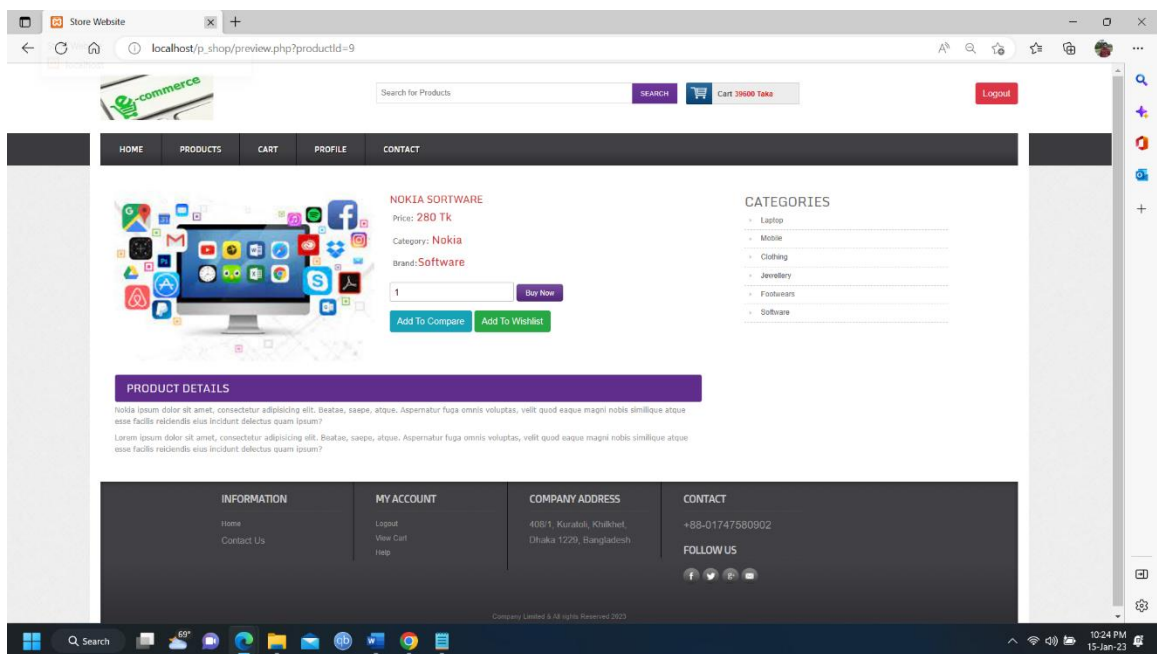


Figure 3.1: E-commerce product page interface

Signup: For signup customer need to fill his name, email, password, city, zip code in form.
Login: After signup customer need to login by fill register email and password.

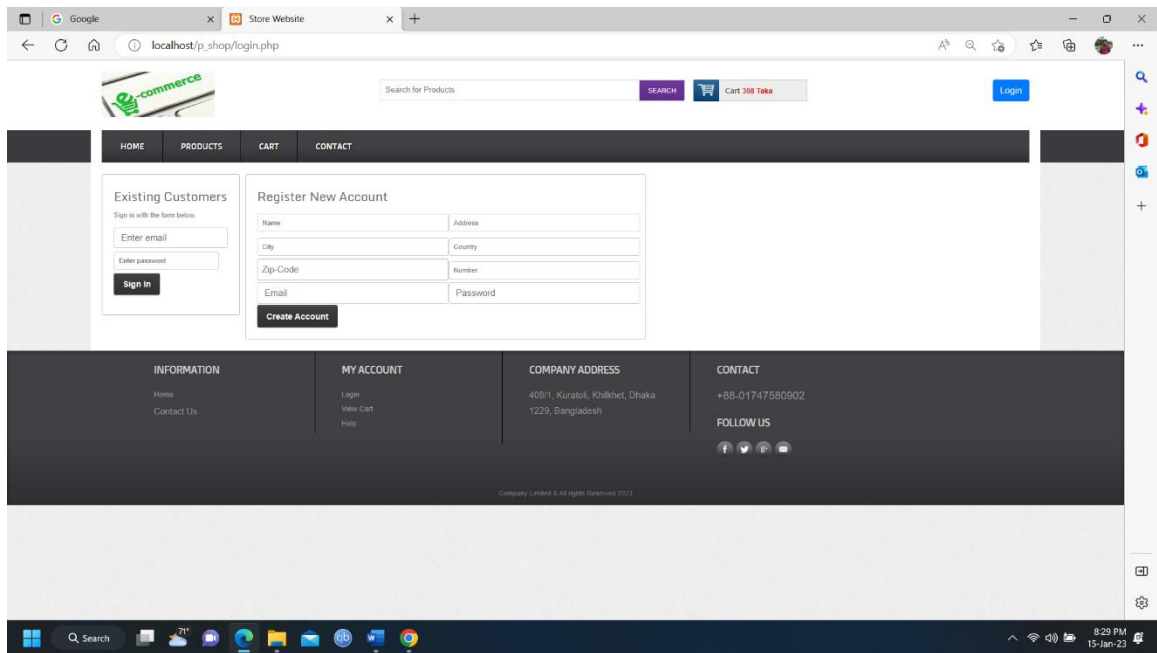


Figure 3.2: E-commerce login and registration page interface

Checkout: From cart page customer need to pay and then payment gateway software is opened when customer click for checkout for payment.

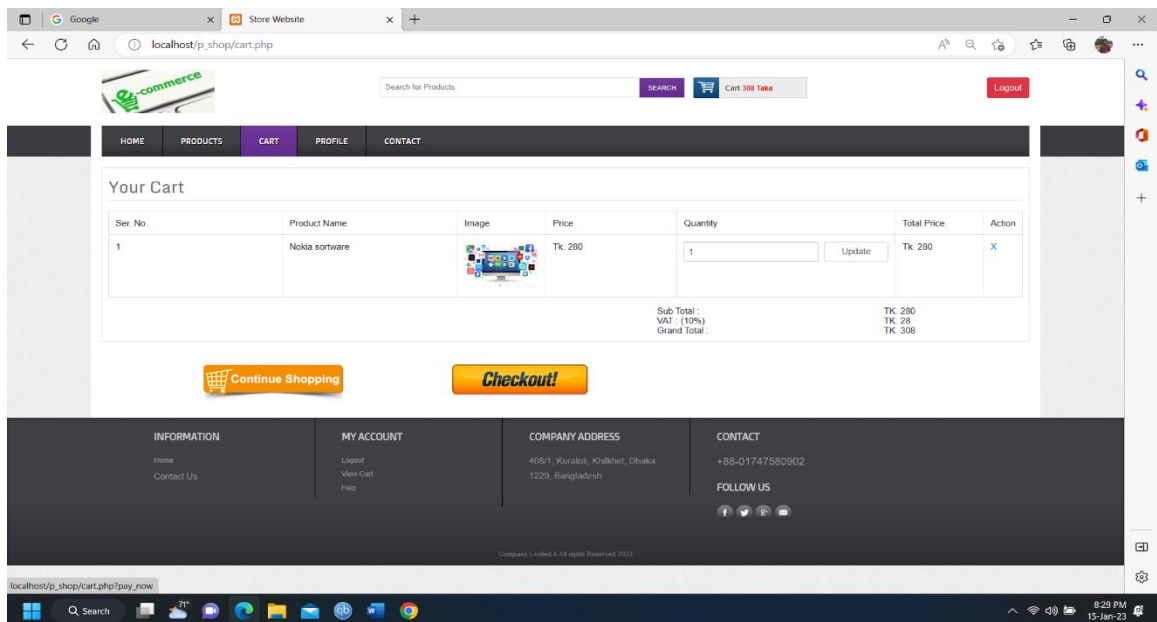


Figure 3.3: E-commerce checkout page interface

4.4 Database Design

Database is designed for E-commerce and Payment gateway where is store data.

E-commerce sites database design:

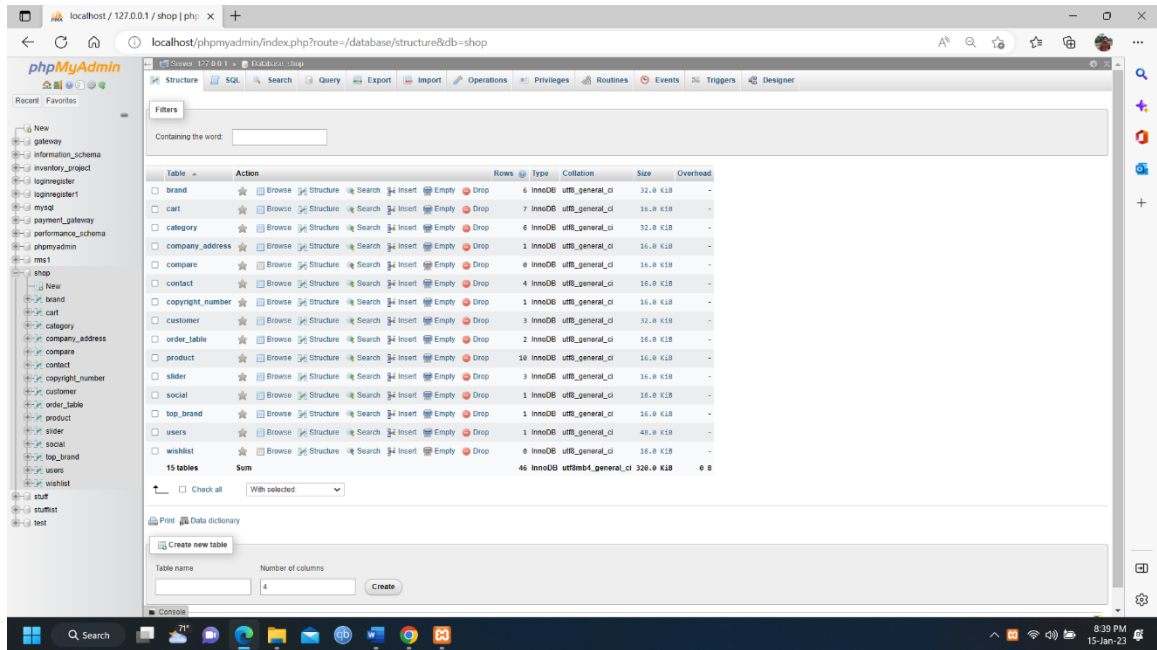


Figure 4: E-commerce database design

Payment gateway system database design:

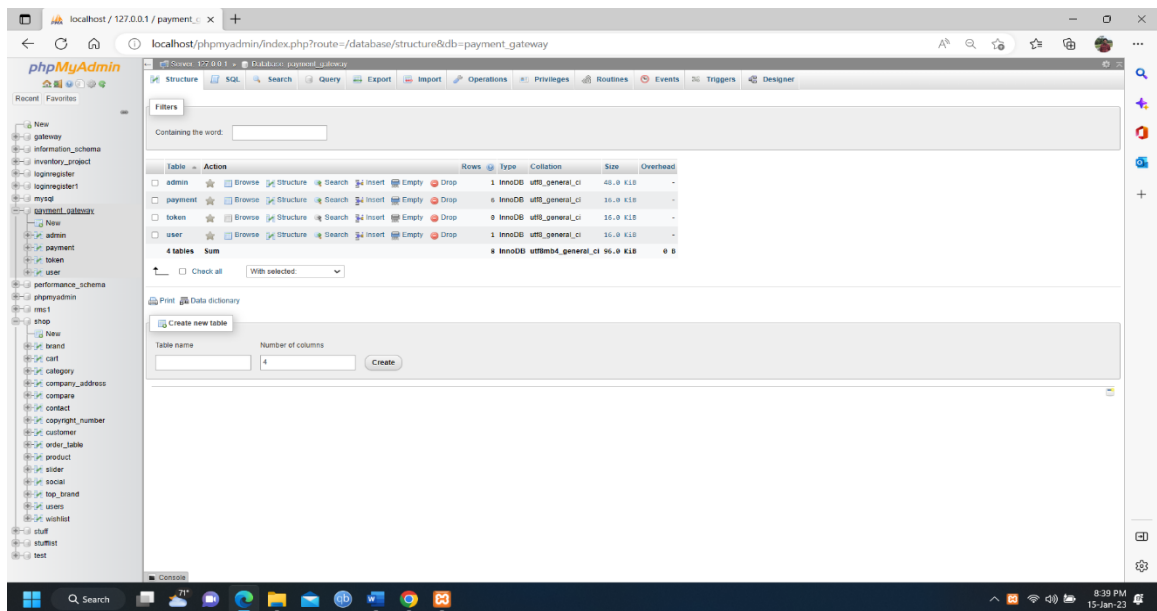


Figure 4.1: Payment gateway database design

4.5 System Diagram Design

Use case diagram:

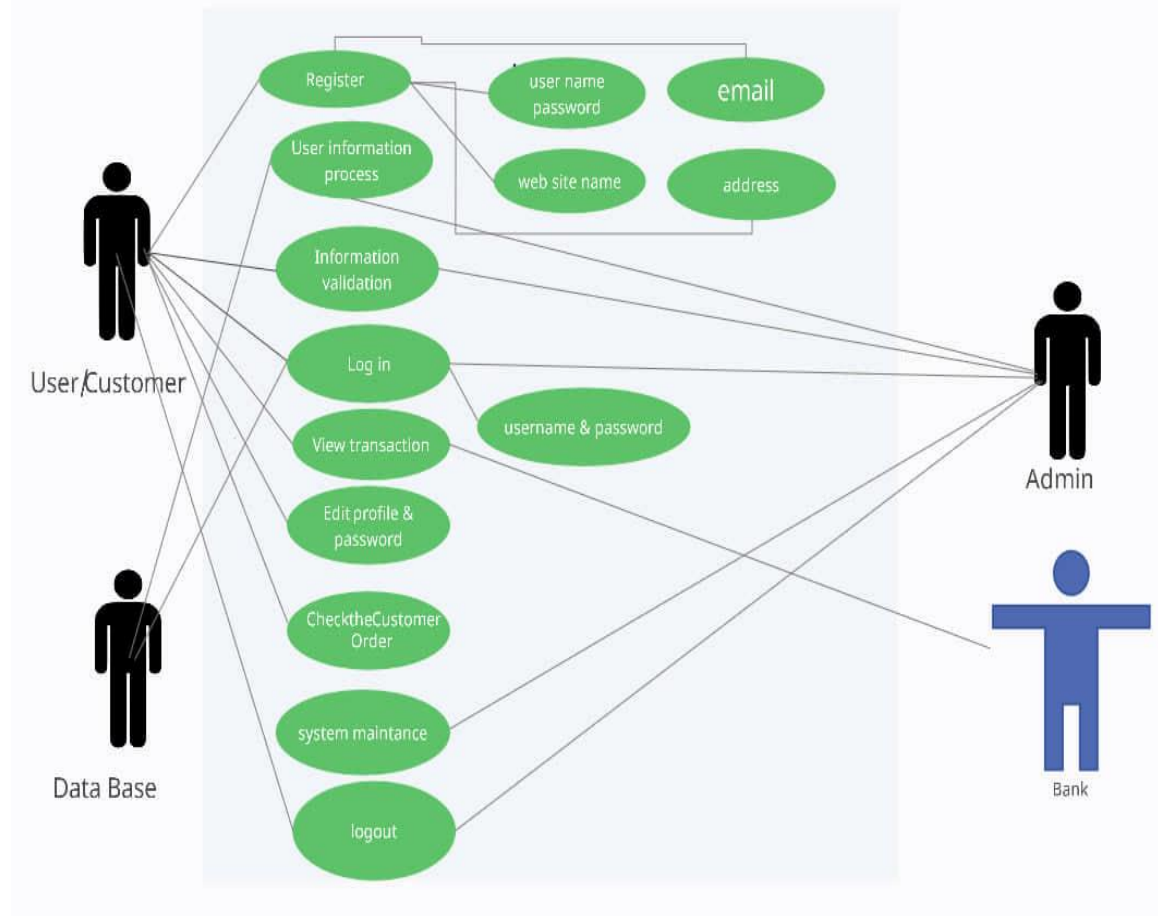


Figure 5: Use case Diagram

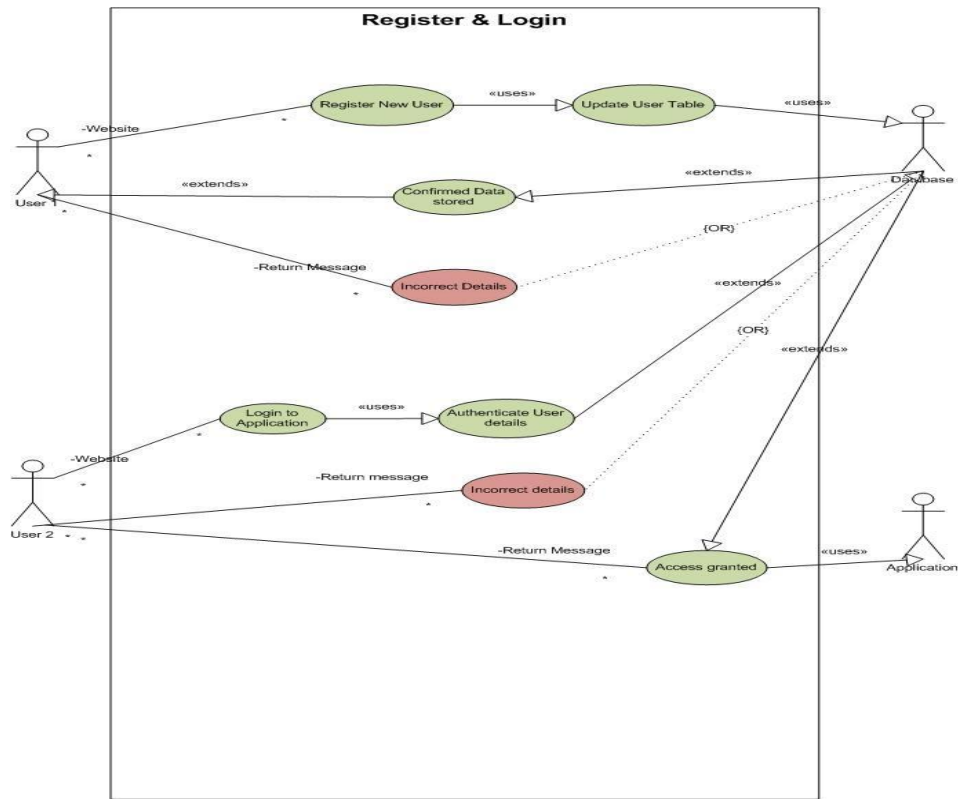


Figure 5.1: Use case Diagram (Login & registration)

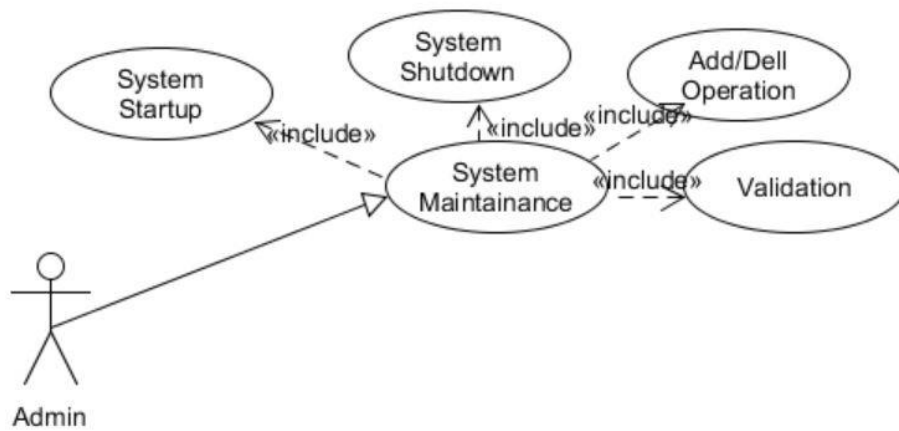


Figure 5.2: Use Case diagram (Admin)

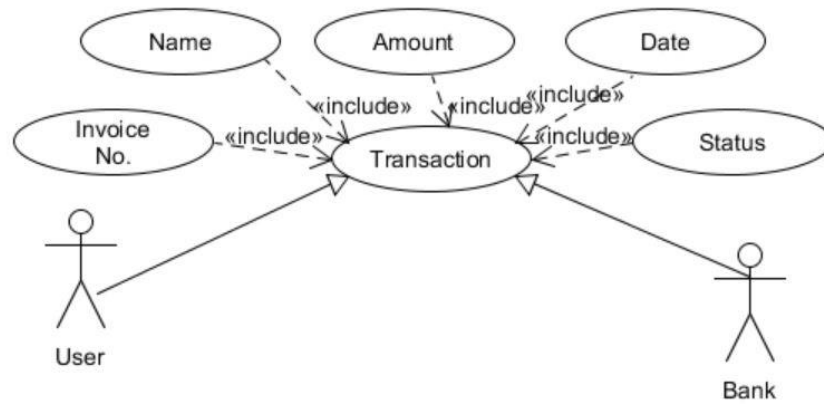


Figure 5.3: Use case Diagram (Transaction)

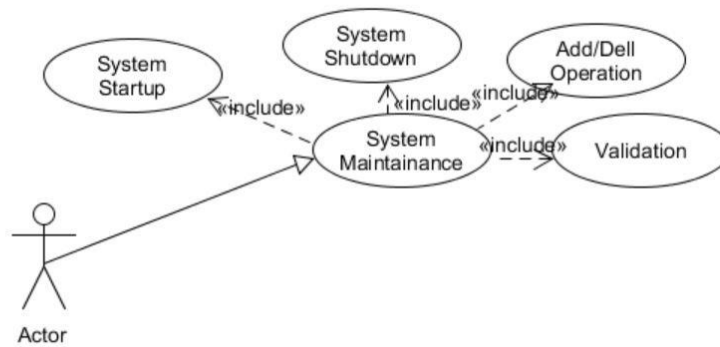


Figure 5.4: Use case Diagram (Maintenance)

Activity Diagram:

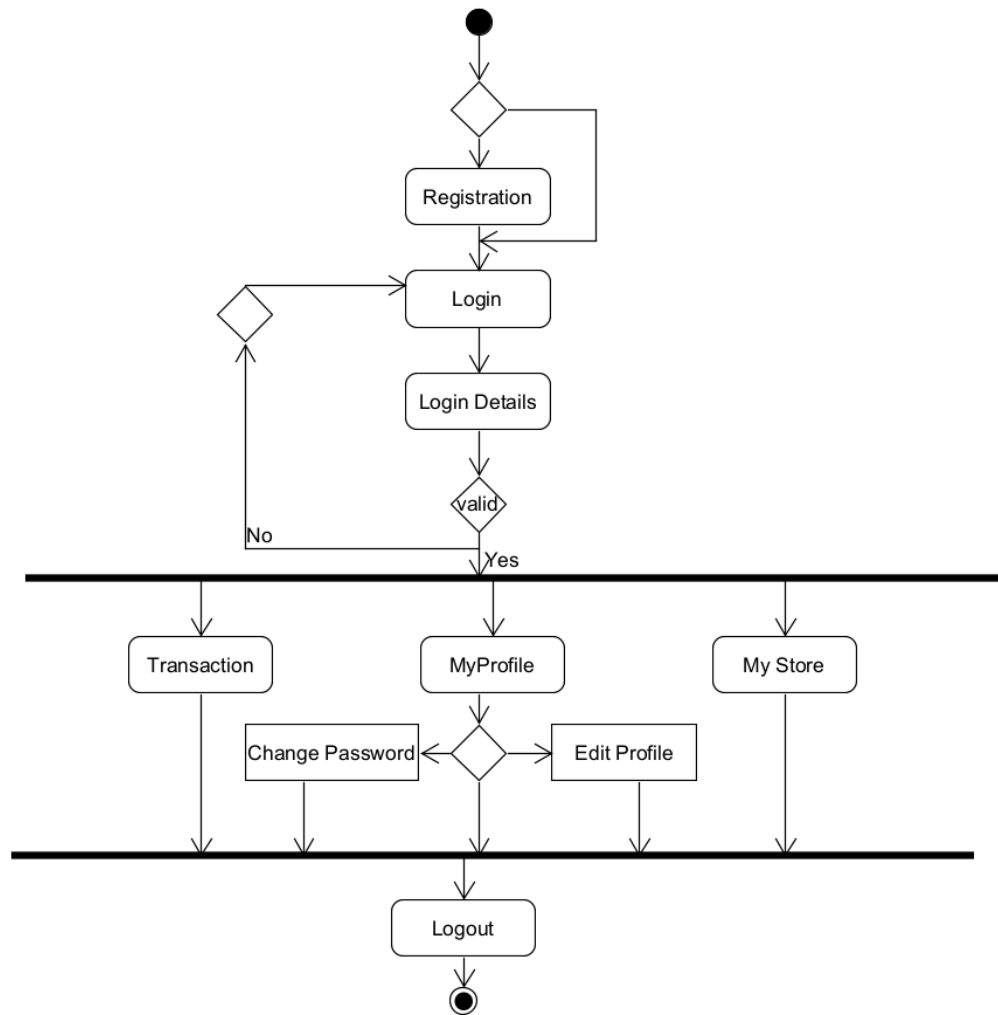


Figure 5.5: Activity Diagram

Sequence Diagram

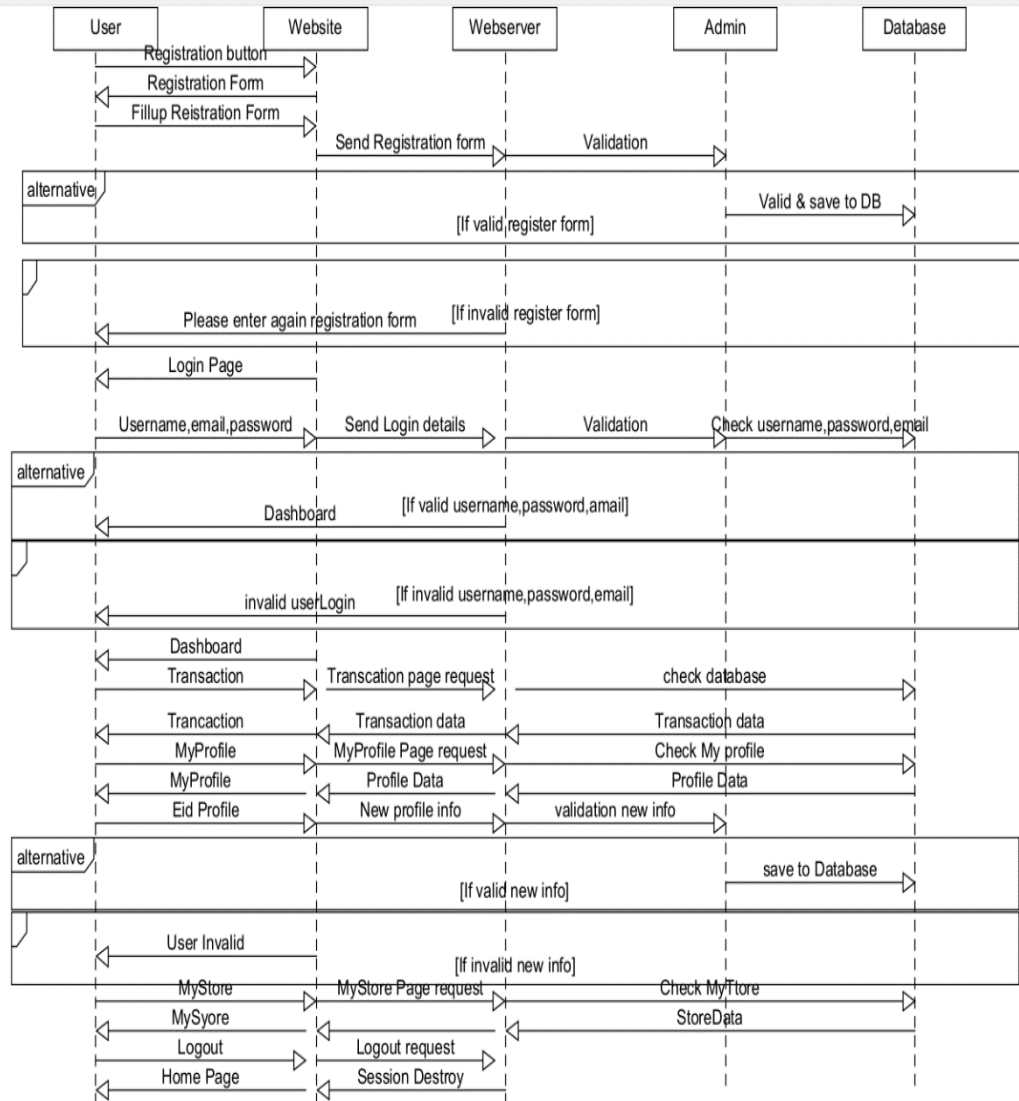


Figure 5.6: Sequence Diagram

ER Diagram

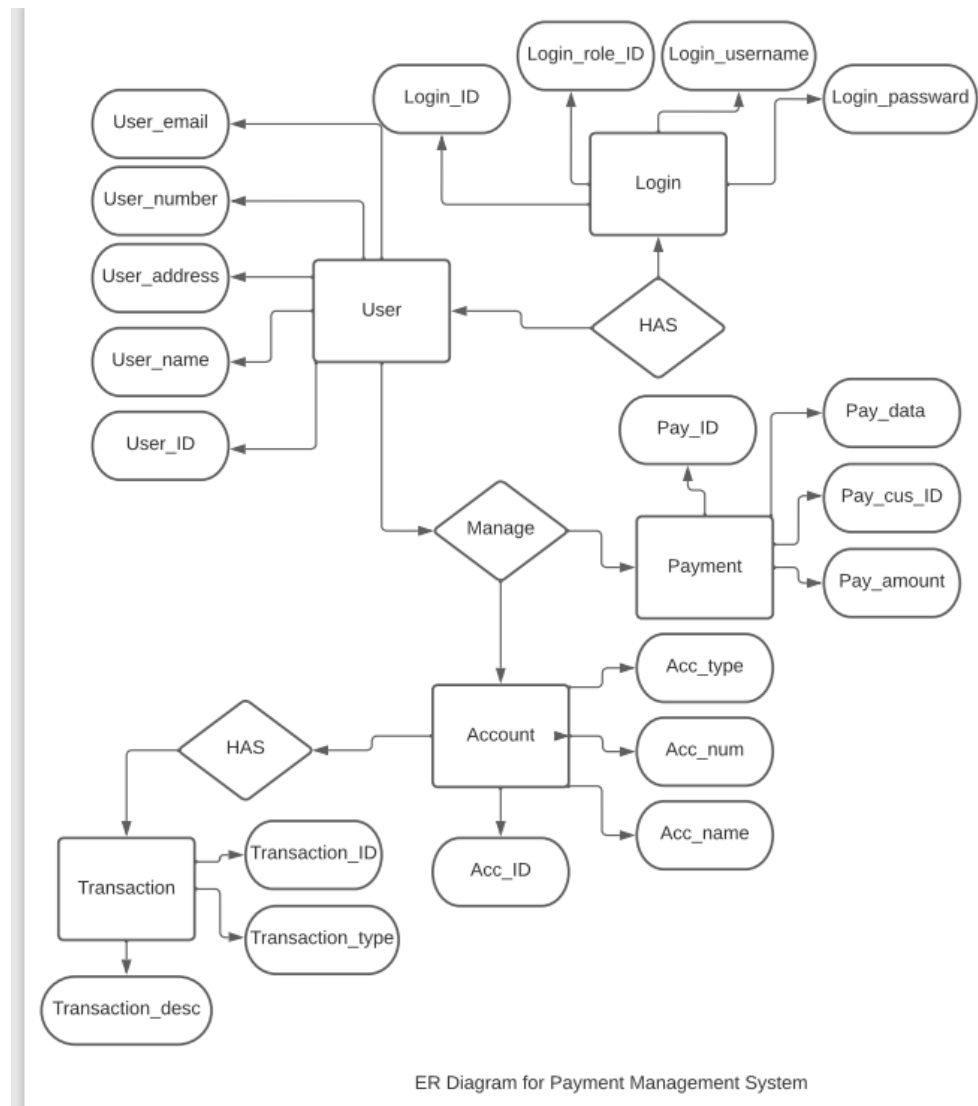


Figure 5.7: ER Diagram

Chapter 5: Impact and Constrains

5.1 Impact of this payment gateway

In this modern era online payment system is getting more popular day by day. By increasing a good number of e-commerce company and web sites, a payment gateway software will get a big opportunity to establish electronic payment system. In Bangladesh there have many online payment platform and Bank serve their customer online banking service, so there have may payment medium for customer but there have a limited number of payment gateway. In this time payment gateway service will provide technically and financially service for both merchant and customers. Our Electronic payment gateway is trustier third-party payment gateway. Every E-commerce can be integrating our payment gateway with their e-commerce websites and the procedures are very easy. Our payment gateway software is user friendly and its interface is easy to understand. Merchant and Customer will be get a user-friendly and secured payment gateway. Customer can easily complete their payment throw our electronic payment gateway. Customer will not need to provide all documents of payment service details. In Bangladesh our payment gateway will be hassle free and reliable. In future Our payment gateway service provides twenty-four hours service for merchant and customer. Customer can pay their payment in short of times, and will get notification of payments that serves them comfort and hassle free. Customer will not be sending their card number, pin to e-commerce merchant and it will be provided more secured service to them. Customer will not need to call merchant for confirming payment anymore. It will save their times and hassle and keep distance from online fraud. Merchant can be see their customer payment status and conditions. Merchant can give their customer a trusty and secured payment options that will increase their order and carry their business move forward. Merchant can withdraw money any times and any methods. This payment gateway will serve a good impact in our social life. People of the country will be more inspire and motivate to use internet and order daily needs and product from online. Investors will invest more money to E-commerce company. E-commerce company can provide best service for their customers. Technology establishment will become more significant part of development the country and its population. E-commerce business can reduce time, cost and can easily delivery their product towards their customer. Our Payment gateways will create a smooth payment service and shifting order money from customer to merchant account. It will keep make good speed of e-commerce business and will play a revolutionary impact in Online Commerce. Our Payment Gate way service is made by and maintains the rules of Bangladeshi rules and regulations. Our Payment gateway will keep a good impact in social and internet life's will make peoples life more comfort in technically and financially. Merchant and customer will get a secured, hassle free payment gateway and It will increase e-commerce business move forward and more popular to its regular customer service.

5.2 Constrains

There have some constrains and limitations of our payment gateway system. Our Payment gateway system is not quite friendly in mobile apps. In certain bank not issued some customers card. Sometimes internet issue may occur. After customer payment successfully there have no way to pay back to customer from payment gateway. When payment service provider server, bank server crashed or error problem then it also affects payment gateway. Sometimes Payment service provider change their api and it causes hamper to our payment gateway. Some E-commerce code is not written in php but our api code is written in php language so it not friendly for those e-commerce sites. Sometimes E-commerce merchant can't integrate our plugin systems because of a good lack of knowledges. Sometimes internet service provider facing their internal problems.

5.3 Future Work

Future plans include for improved and richer user interface design. We will add more feature. We will create more applicable API that every e-commerce site can use. We will add more payment service provider to our payment gateway. We will add more options that merchant can easily find their order payments and merchant can easily withdraw their money. We will also provide merchant more verification service that secured their payment and also simple and verified registration and login service that secured from online fraud. We will also focus to implement a more secured system that store customer data more secured. We will add more developer that as if any time any error can be solved. In future we will serve merchant twenty-four hours error free service. We will advertise our payment gateway in village to city that every people of our county can gain knowledge about our payment gateway. In future our payment gateway service integrate cost will be reduced. In future we will also focus on investment and brand value of our Payment gateway.

Chapter 6: Conclusion

6.1 Discussion and Conclusion

A payment gateway is a crucial component of a payment service in the current e-commerce revolution. A third-party payment gateway can provide a safe, user-friendly payment process that offers customers and businesses a reliable service while guarding against fraud and hackers. Sensitive credit card information is transmitted from the client to the bank and the merchant using a payment gateway. As we created a payment gateway, we discovered some design and implementation errors. In the end, our payment gateway will offer both customers and merchants helpful, secure, and excellent gateway services. Day by day the world become more digitalized and performed daily necessary task from home. Payment gateway service also shows its necessity in daily online service specially e-commerce service. Our Payment gateway will keep a good impact in social and online life. In this modern digital revolution payment gateway service will also benefited financially. Merchant can easily integrate payment gateway and easily can solve its payment procedure. That's why people of our country will more motivate to buy product from e-commerce and complete their payments. Government will also be benefited. Our payment gateway is more convenience and focused on a good user interface and limited number of codes that's why merchant can easily integrate it its e-commerce. Our payment gateway serves api code to its merchant that merchant can easily understand. Merchant can withdraw order money from our payment gateway websites. This Payment gateway will be error free that no hassle to use it. Its feature and interface is user-friendly. This payment gateway is secured and encrypt card holder data that provide him a secured service. Customer can get rid of traditional payment method that needed to call merchant for his payment conformation. Merchant can see any time that his customer is paid or not after paid from his customer merchant can withdraw money that helps him to get money easiest way and save him from online fraud. This payment gate way will add a different matrix in e-commerce industry. It will keep a valuable importance in IT and online society and online payment system in our country.

6.2 References

- [1] Yakal, K. (1997), "Working the Net: Electronic Commerce: Not Yet Booming but Strong Beginnings," netWorker 1(3), pp. 23-27
- [2] Dr.C.K.Gomathy, "AN EFFICIENT AND SECURE ELECTRONIC PAYMENT PROTOCOL THROUGH E COMMERCE"
- [3] Khaled AL-Qawasmi (2020), "Proposed E-payment Process Model to Enhance Quality of Service through Maintaining the Trust of Availability"
- [4] Burhan Ul Islam Khan (2017), "A Compendious Study of Online Payment Systems: Past Developments, Present Impact, and Future Considerations"
- [5] Mohmed Hassan Nasr (2020), "E-PAYMENT SYSTEMS RISKS, OPPORTUNITIES AND CHALLENGES FOR IMPROVED RESULTS IN E-BUSINESS"
- [5] Prof. Sana Khan, "A Study on Usage of ePayments for Sustainable Growth of Online Business"
- [6] SSLCOMMERZ: Payment Gateway in Bangladesh.
www.sslcoomerz.com

Chapter 7: Appendix

7.1 Core Modules of the Project

Pay.php

```
<?php
ob_start();
include_once "classes/Common.php";
include_once "helpers/Format.php";

$format = new Format();
$common = new Common();

if (isset($_GET['token']) && $_GET['token'] != "") {
    $token_id = $_GET['token'];
    $token_details = $common->select("`token`", "`id` = '$token_id'");
    if ($token_details) {
        $token_detail = mysqli_fetch_assoc($token_details);

        $success_url = $token_detail['success_url'];
        $cancel_url = $token_detail['cancel_url'];
        $customer = $token_detail['customer'];
        $amount = $token_detail['amount'];
        $transaction_id = $token_detail['transaction_id'];
        $marchant_id = $token_detail['marchant_email'];
    } else {
        header("Location: http://localhost/payment-gateway");
    }
} else {
    header("Location: http://localhost/payment-gateway");
}

if ($_SERVER['REQUEST_METHOD'] == 'POST' && isset($_POST['card_pay'])) {
    $type = 'card';
    $card_number = $_POST['card_number'];
    $mm_yy = $_POST['mm_yy'];
    $cvc_cvv = $_POST['cvc_cvv'];
    $card_owner = $_POST['card_owner'];

    $transaction_id = uniqid() . time();

    $insert = $common->insert("`payment`(`marchant`, `customer`, `transaction_id`, `amount`, `type`,
`card_number`, `mm_yy`, `cvc_cvv`, `card_owner`)", "('$marchant_id', '$customer', '$transaction_id',
'$amount', '$type', '$card_number', '$mm_yy', '$cvc_cvv', '$card_owner')");
    if ($insert) {
        $common->delete("`token`", "`id` = '$token_id'");
        header("Location: " . $success_url . "?id=" . $transaction_id);
    } else {
        $failed = '<div class="alert alert-danger mt-2">Something is wrong!</div>';
    }
}
```

```

    }
}

if ($_SERVER['REQUEST_METHOD'] == 'POST' && isset($_POST['mobile_pay'])) {
    $type = $_POST['type'];
    $number = $_POST['number'];

    $transaction_id = uniqid() . time();

    $insert = $common->insert("`payment`(`marchant`,`customer`,`transaction_id`,`amount`,`type`,`number`)", "('$marchant_id', '$customer', '$transaction_id', '$amount', '$type', '$number')");
    if ($insert) {
        $common->delete("`token`", "`id` = '$token_id'");
        header("Location: " . $success_url . "?id=" . $transaction_id);
    } else {
        $failed = '<div class="alert alert-danger mt-2">Something is wrong!</div>';
    }
}

if ($_SERVER['REQUEST_METHOD'] == 'POST' && isset($_POST['bank_pay'])) {
    $type = $_POST['type'];
    $account_number = $_POST['account_number'];
    $branch = $_POST['branch'];

    $transaction_id = uniqid() . time();

    $insert = $common->insert("`payment`(`marchant`,`customer`,`transaction_id`,`amount`,`type`,`account_number`,`branch_name`)", "('$marchant_id', '$customer', '$transaction_id', '$amount', '$type', '$account_number', '$branch')");
    if ($insert) {
        $common->delete("`token`", "`id` = '$token_id'");
        header("Location: " . $success_url . "?id=" . $transaction_id);
    } else {
        $failed = '<div class="alert alert-danger mt-2">Something is wrong!</div>';
    }
}

?>

<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Online Payment</title>
    <link rel="stylesheet"
href="https://cdn.jsdelivr.net/npm/bootstrap@4.6.2/dist/css/bootstrap.min.css" integrity="sha384-
xOoIHfLEh07PJGoPkLv1IbcEPTNtaed2xpHsD9ESMhqIYd0nLMwNLD69Npy4HI+N"
crossorigin="anonymous">
    <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/6.2.1/css/all.min.css" integrity="sha512-
MV7K8+y+gLIBoVD59IQIYicR65iaqukzvf/nwasF0nqhPay5w/9lJmVM2hMDcnK1OnMGCdVK+iQrJ7lz
PJQd1w==" crossorigin="anonymous" referrerpolicy="no-referrer" />
</head>
<body style="background-image: url(https://blog.2checkout.com/wp-content/uploads/2020/07/online-
payment-gateway.png);

```

```

background-repeat: no-repeat;
background-attachment: fixed;
background-size: 100% 100%;">

<div class="container py-5">
  <p class="font-italic text-white">Support: fahimahmed6008@gmail.com</p>
  <div class="row">
    <div class="col-md-5">
      <div class="card">
        <div class="card-header bg-primary text-white">
          <h5 class="mb-0">
            <i class="fas fa-shopping-cart mr-2"></i>
            Your Order Summary
          </h5>
        </div>
        <div class="card-body">
          <table class="table table-bordered">
            <tbody>
              <tr>
                <td>Customer Name</td>
                <td><?= $customer; ?></td>
              </tr>
              <tr>
                <td>Merchant</td>
                <td><?= $marchant_id; ?></td>
              </tr>
              <tr>
                <td>Total Amount</td>
                <td>
                  <b><?= $amount; ?>/=BDT</b>
                </td>
              </tr>
              <tr>
                <td colspan="2">
                  <a href="<?= $cancel_url; ?>" class="btn
btn-danger float-right">Cancel</a>
                </td>
              </tr>
            </tbody>
          </table>
        </div>
      </div>
      <?= isset($failed) ? $failed : ">"; ?>
    </div>
    <div class="col-md-7">
      <div class="card">
        <div class="card-header bg-primary text-white">
          <h5 class="mb-0">
            <i class="fas fa-money-check mr-2"></i>
            Select Payment Method
          </h5>
        </div>
        <div class="card-body">
          <ul class="nav nav-tabs" id="myTab" role="tablist">
            <li class="nav-item" role="presentation">

```

```

        <button class="nav-link active" id="card-tab" data-
toggle="tab" data-target="#card" type="button" role="tab" aria-controls="card" aria-
selected="true">Card</button>

        </li>
        <li class="nav-item" role="presentation">
            <button class="nav-link" id="mobile-tab" data-
toggle="tab" data-target="#mobile" type="button" role="tab" aria-controls="mobile" aria-
selected="false">Mobile Banking</button>

            </li>
            <li class="nav-item" role="presentation">
                <button class="nav-link" id="bank-tab" data-
toggle="tab" data-target="#bank" type="button" role="tab" aria-controls="bank" aria-
selected="false">Internet Banking</button>

                </li>
            </ul>
            <div class="tab-content" id="myTabContent">
                <div class="tab-pane fade show active" id="card"

role="tabpanel" aria-labelledby="card-tab">

                    <div id="card_part" class="mt-3">
                        

                        <form action="" method="POST"
class="mt-2">

                            <input class="form-
control mb-3" type="text" pattern="[0-9]{16}" name="card_number" placeholder="Card Number"
required>

                            <div class="form-row">
                                <div class="col mb-3">
                                    <input type="number"
class="form-control" name="mm_yy" placeholder="MM/YY" pattern="[0-9]{4}" required>
                                </div>
                                <div class="col">
                                    <input type="number"
class="form-control" name="cvc_cvv" placeholder="CVC/CVV" pattern="[0-9]{3}" required>
                                </div>
                            </div>
                            <input class="form-control mb-3"
type="text" name="card_owner" placeholder="Card Owner Name" required>
                            <button type="submit" class="btn
btn-primary w-100" name="card_pay">Pay Now</button>

                        </form>
                    </div>
                </div>
                <div class="tab-pane fade" id="mobile"

role="tabpanel" aria-labelledby="mobile-tab">

                    <div id="mobile_part" class="mt-3">
                        <div
onclick="mobile_part('bkash')" class="d-inline-block pr-3">

                            
                        </div>
                        <div
onclick="mobile_part('nagad')" class="d-inline-block pr-3">

```

```

src="assets/images/nagad.png" style="width: 120px; height: 80px; cursor: pointer;" alt="Ibbl">
</div>
<div
onclick="mobile_part('rocket')" class="d-inline-block pr-3">

</div>
</div>
<div class="tab-pane fade" id="bank"
role="tabpanel" aria-labelledby="bank-tab">
<div id="bank_part" class="mt-3">
<div
onclick="internet_banking('islami')" class="d-inline-block pr-3">

</div>
<div
onclick="internet_banking('city')" class="d-inline-block pr-3">

</div>
<div
onclick="internet_banking('asia')" class="d-inline-block pr-3">

</div>
</div>
</div>
</div>
</div>
</div>
</div>
</div>
<!-- mobile banking modal start -->
<div class="modal fade" id="mobile_banking" data-backdrop="static" data-keyboard="false"
tabindex="-1" aria-labelledby="staticBackdropLabel" aria-hidden="true">
<div class="modal-dialog modal-dialog-centered">
<div class="modal-content">
<div class="modal-header">
<h5 class="modal-title" id="staticBackdropLabel">
Mobile Banking
</h5>
<button type="button" class="close" data-dismiss="modal" aria-label="Close">
<span aria-hidden="true">&times;</span>
</button>
</div>
<div class="modal-body">
<div class="text-center mb-3">
<div id="mobile_image"></div>
<p class="mt-3"><b><?=$amount; ?>/=BDT</b></p>
</div>
<form class="p-3 mobile_banking" action="" method="POST">

```

```

        <input type="hidden" name="type" id="mobile_type">
        <p class="text-center text-white">Your Account number</p>
        <input class="form-control mb-3" type="tel" name="number" placeholder="e.g
01XXXXXXXXXX" required>
        <input class="form-control mb-3" type="password" name="password"
placeholder="Your Pin" required>
        <input type="submit" class="btn btn-secondary mb-3 w-100" name="mobile_pay"
value="Pay Now">
    </form>
</div>
</div>
</div>
</div>
<!-- mobile banking modal end -->

<!-- internet banking modal start -->
<div class="modal fade" id="internet_banking" data-backdrop="static" data-keyboard="false"
tabindex="-1" aria-labelledby="staticBackdropLabel" aria-hidden="true">
    <div class="modal-dialog modal-dialog-centered">
        <div class="modal-content">
            <div class="modal-header py-2">
                <h5 class="modal-title" id="staticBackdropLabel">
                    Internet Banking
                </h5>
                <button type="button" class="close" data-dismiss="modal" aria-label="Close">
                    <span aria-hidden="true">&times;</span>
                </button>
            </div>
            <div class="modal-body">
                <div class="text-center mb-3">
                    <img id="bank_image" src="" style="width: 120px;" alt="Image">
                    <p class="mt-3"><b><?=$amount; ?>/=BDT</b></p>
                </div>
                <form class="p-3 internet_banking" action="" method="POST">
                    <input type="hidden" name="type" id="bank_type">
                    <input class="form-control mb-3" type="number" name="account_number"
placeholder="Account Number" required>
                    <input class="form-control mb-3" type="text" name="branch" placeholder="Branch
Name" required>
                    <input type="submit" class="btn btn-secondary mb-3 w-100" name="bank_pay"
value="Pay Now">
                </form>
            </div>
        </div>
    </div>
</div>
<!-- internet banking modal end -->

<script src="https://cdn.jsdelivr.net/npm/jquery@3.5.1/dist/jquery.slim.min.js" integrity="sha384-
DfXdz2htPH0lsSSs5nCTpuj/zy4C+OGpamoFVy38MVBnE+IbbVYUew+OrCXaRkfj"
crossorigin="anonymous"></script>
<script src="https://cdn.jsdelivr.net/npm/bootstrap@4.6.2/dist/js/bootstrap.bundle.min.js"
integrity="sha384-Fy6S3B9q64WdZWQUiU+q4/2Lc9npb8tCaSX9FK7E8HnRr0Jz8D6OP9dO5Vg3Q9ct"
crossorigin="anonymous"></script>

<script>

```

```

        function mobile_part(value) {
            $('#mobile_type').val(value);
            if(value == 'bkash') {
                $('#mobile_image').html('');
                $('.mobile_banking').css("background-color", 'rgba(200,22,88,255)');
            } else if(value == 'nagad') {
                $('#mobile_image').html('');
                $('.mobile_banking').css("background-color", 'rgba(200,22,88,255)');
            } else if(value == 'rocket') {
                $('#mobile_image').html('');
                $('.mobile_banking').css("background-color", 'rgba(134,39,138,255)');
            }
            $('#mobile_banking').modal('show');
        }
        function internet_banking(value) {
            $('#bank_type').val(value);
            if(value == 'islami') {
                $('#bank_image').attr("src", 'http://localhost/payment-
gateway/assets/images/ibbl.png');
                $('.internet_banking').css("background-color", 'rgba(0,122,72,255)');
            } else if(value == 'city') {
                $('#bank_image').attr("src", 'http://localhost/payment-
gateway/assets/images/citytouch.png');
                $('.internet_banking').css("background-color", 'rgba(235,39,39,255)');
            } else if(value == 'asia') {
                $('#bank_image').attr("src", 'http://localhost/payment-
gateway/assets/images/bankasia.png');
                $('.internet_banking').css("background-color", 'rgba(34,99,175,255)');
            }
            $('#internet_banking').modal('show');
        }
    }
</script>

</body>
</html>

```

Authentication.php

```
<?php

ob_start();
include_once "lib/Database.php";
include_once "lib/Session.php";
include_once "helpers/Format.php";

Session::checkUserLogin();

spl_autoload_register(function($class_name) {
    include_once 'classes/' . $class_name . ".php";
});
$databse = new Database();
$format = new Format();
$customer = new Customer();
$common = new Common();

if ($_SERVER['REQUEST_METHOD'] == 'POST' && isset($_POST['add_customer'])) {
    $addCustomer = $customer->addCustomer($_POST);
}

if ($_SERVER['REQUEST_METHOD'] == 'POST' && isset($_POST['customer_login'])) {
    $customerLogin = $customer->customerLogin($_POST);
}

?>
<!doctype html>
<html lang="en">
<head>
    <meta charset="utf-8">
    <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no">
    <meta name="description" content="">
    <meta name="author" content="Mark Otto, Jacob Thornton, and Bootstrap contributors">
    <meta name="generator" content="Hugo 0.101.0">
    <title>Signin Template · Bootstrap v4.6</title>

    <link rel="canonical" href="https://getbootstrap.com/docs/4.6/examples/sign-in/">

    <!-- Bootstrap core CSS -->
    <link rel="stylesheet" href="https://cdn.jsdelivr.net/npm/bootstrap@4.6.2/dist/css/bootstrap.min.css"
    integrity="sha384-
    xOolHFLEh07PJGoPkLv1IbcEPTNtaed2xpHsD9ESMhqIYd0nLMwNLD69Npy4HI+N"
    crossorigin="anonymous">

    <style>
    html,
    body {
        height: 100%;
    }
    </style>
```



```

body {
  display: -ms-flexbox;
  display: flex;
  -ms-flex-align: center;
  align-items: center;
  padding-top: 40px;
  padding-bottom: 40px;
  background-color: #f5f5f5;
}

.form-signin {
  width: 100%;
  max-width: 350px;
  padding: 15px;
  margin: auto;
}
.form-signin .checkbox {
  font-weight: 400;
}
.form-signin .form-control:focus {
  z-index: 2;
}

.bd-placeholder-img {
  font-size: 1.125rem;
  text-anchor: middle;
  -webkit-user-select: none;
  -moz-user-select: none;
  -ms-user-select: none;
  user-select: none;
}

@media (min-width: 768px) {
  .bd-placeholder-img-lg {
    font-size: 3.5rem;
  }
}
</style>

</head>
<body class="text-center">

<div class="container">
  
  <div class="row">
    <div class="col-md-6 border-right border-primary">
      <form action="" method="POST" class="form-signin">
        <h1 class="h3 mb-3 font-weight-normal">Sign In</h1>
        <label for="inputEmail" class="sr-only">Email address</label>
        <input type="email" id="inputEmail" name="email" class="form-control" placeholder="Email
address" required autofocus>
        <?php if (isset($customer->emailErr)) { echo $customer->emailErr; } ?>
        <label for="inputPassword" class="sr-only">Password</label>
        <input type="password" id="inputPassword" class="form-control mt-3" placeholder="Password"
name="password" required>
        <?php if (isset($customer->passwordErr)) { echo $customer->passwordErr; } ?>

```

```

        <button class="btn btn-lg btn-primary btn-block mt-3" type="submit"
name="customer_login">Sign in</button>
    </form>
    <?php if (isset($customerLogin)) { echo $customerLogin; } ?>
</div>
<div class="col-md-6">
    <form action="" method="POST" class="form-signin">
        <h1 class="h3 mb-3 font-weight-normal">Sign Up</h1>
        <input type="text" class="form-control" name="name" placeholder="Enter name" required>
        <?php if (isset($customer->name)) { echo $customer->name; } ?>
        <input type="email" class="form-control mt-3" name="email" placeholder="Enter email" required>
        <?php if (isset($customer->email)) { echo $customer->email; } ?>
        <input type="text" class="form-control mt-3" name="address" placeholder="Enter address"
required>
        <?php if (isset($customer->address)) { echo $customer->address; } ?>
        <input type="number" class="form-control mt-3" name="number" placeholder="Enter number"
pattern="[0-9]{11}" required>
        <?php if (isset($customer->number)) { echo $customer->number; } ?>
        <input type="password" class="form-control mt-3" name="password" placeholder="Password"
required>
        <?php if (isset($customer->password)) { echo $customer->password; } ?>
        <button class="btn btn-lg btn-primary btn-block mt-3" name="add_customer" type="submit">Sign
Up</button>
    </form>
    <?php if (isset($addCustomer)) { echo $addCustomer; } ?>
</div>
</div>
</div>

</body>
</html>

```

Withdraw-list.php

```
<?php include 'inc/header.php'; ?>
<?php include 'inc/slider.php'; ?>
<?php

$marchant_email = $user_detail['email'];

if ($_SERVER['REQUEST_METHOD'] == 'POST' && isset($_POST['withdraw'])) {
    $common->update("`payment`, ``status` = '1'", ``marchant` = '$marchant_email' && `status` = '0'");
}

?>
<main role="main" class="col-md-9 ml-sm-auto col-lg-10 px-md-4">
    <div class="d-flex justify-content-between flex-wrap flex-md-nowrap align-items-center pt-3 pb-2 mb-3 border-bottom">
        <h1 class="h2">Dashboard</h1>
        <div class="btn-toolbar mb-2 mb-md-0">

            </div>
        </div>

        <h5 class="d-inline-block text-warning border-bottom">Pending Withdraw</h5>
        <table class="table table-bordered table-striped">
            <thead>
                <tr>
                    <th>Serial</th>
                    <th>Customer</th>
                    <th>Transaction ID</th>
                    <th>Type</th>
                    <th>Amount</th>
                    <th>Date</th>
                </tr>
            </thead>
            <tbody>
                <?php
                $all_payments = $common->select("`payment`, ``marchant` = '$marchant_email' && `status` = '0'");
                if ($all_payments) {
                    $sl = 1;
                    while ($all_payment = mysqli_fetch_assoc($all_payments)) {
                        ?>
                        <tr>
                            <td><?=$sl; ?></td>
                            <td><?=$all_payment['customer']; ?></td>
                            <td><?=$all_payment['transaction_id']; ?></td>
                            <td class="text-capitalize"><?=$all_payment['type']; ?></td>
                            <td><?=$all_payment['amount']; ?> TK</td>
                            <td><?=$format->dateFormat($all_payment['created_at']); ?></td>
                        </tr>
                        <?php
                        $sl++;
                    }
                }
                ?>
                <tr>
                    <td colspan="6">
                        <a class="btn btn-primary float-right" href="withdraw.php">Withdraw</a>
                    </td>
                </tr>
            </tbody>
        </table>
    </div>
</main>
```

```

        </td>
    </tr>
    <?php
    } else {
    ?>
    <tr>
        <td colspan="6"><h5 class="text-center">No data found!</h5></td>
    </tr>
    <?php
    }

    ?>
</tbody>
</table>

<br>
<br>
<h5 class="d-inline-block text-success border-bottom">Success Withdraw</h5>
<table class="table table-bordered table-striped">
    <thead>
        <tr>
            <th>Serial</th>
            <th>Customer</th>
            <th>Transaction ID</th>
            <th>Type</th>
            <th>Amount</th>
            <th>Date</th>
        </tr>
    </thead>
    <tbody>
    <?php
    $s_all_payments = $common->select("`payment`", "`marchant` = '$marchant_email' && `status` =
'1'");
    if ($s_all_payments) {
        $s_sl = 1;
        while ($s_all_payment = mysqli_fetch_assoc($s_all_payments)) {
            ?>
            <tr>
                <td><?= $s_sl; ?></td>
                <td><?= $s_all_payment['customer']; ?></td>
                <td><?= $s_all_payment['transaction_id']; ?></td>
                <td class="text-capitalize"><?= $s_all_payment['type']; ?></td>
                <td><?= $s_all_payment['amount']; ?> TK</td>
                <td><?= $format->dateFormat($s_all_payment['created_at']); ?></td>
            </tr>
            <?php
            $s_sl++;
        }
    } else {
    ?>
    <tr>
        <td colspan="6"><h5 class="text-center">No data found!</h5></td>
    </tr>
    <?php
    }

```

```

?>
</tbody>
</table>

</main>
<?php include 'inc/footer.php'; ?>

```

API Code:

```

<?php
if (isset($_GET['pay_now'])) {
    $payment_url = "http://localhost/payment-gateway/api.php";
    $success_url = "http://localhost/payment-gateway/success.php";
    $cancel_url = "http://localhost/p_shop/cart.php";

    $customer = Session::get('customerName');
    $amount = Session::get('grand_total');
    $transaction_id = uniqid() . time();

    $marchant_email = 'fahim@gmail.com';
    $marchant_password = 'fahim1234';

    $postRequest = array(
        'success_url' => $success_url,
        'cancel_url' => $cancel_url,
        'customer' => $customer,
        'amount' => $amount,
        'transaction_id' => $transaction_id,
        'marchant_email' => $marchant_email,
        'marchant_password' => $marchant_password
    );

    $postRequest = http_build_query($postRequest);

    $cURL = curl_init($payment_url);
    curl_setopt($cURL, CURLOPT_POSTFIELDS, $postRequest);
    curl_setopt($cURL, CURLOPT_RETURNTRANSFER, true);
    $apiResponse = curl_exec($cURL);

    curl_close($cURL);

    if ($apiResponse != 0) {
        $gatewayPageURL = "http://localhost/payment-gateway/pay.php?token=" .
$apiResponse;
        echo "<meta http-equiv='refresh' content='0;url=" . $gatewayPageURL . ">";
    } else {
        echo '<br><br><div class="alert alert-danger w-50 mx-auto">Something is
wrong!</div>';
    }
}
?>

```