Electricity Bill Management System

A MINI-PROJECT REPORT

Submitted by

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RAJALAKSHMI ENGINEERING COLLEGE

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NOV/DEC, 2024

BONAFIDE CERTIFICATE

Certified that this mini project "**Electricity Bill Management System**" is the bonafide
work of "**PRANNOV SHABARI N (2116220701197)"** who carried out the project work under my supervision.

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Submitted for the End semester practical examination to be held on ____

INTERNAL EXAMINER **EXTERNAL EXAMINER**

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My sincere thanks to my family members, friends and other staff members of Computer Science and Engineering.

Prannov Shabari N 2116220701197

ABSTRACT

The Electricity Bill Management System (EBMS) is designed to streamline and automate the processes involved in electricity billing for both consumers and utility providers. The system aims to enhance efficiency in billing, reduce manual errors, and improve customer satisfaction. By leveraging modern technologies, EBMS offers features such as real-time usage tracking, online bill generation, and payment processing.

The system provides a user-friendly interface for consumers to view their consumption patterns, track payment history, and receive notifications for due payments. For utility providers, it offers robust administrative tools for monitoring usage data, generating detailed reports, and managing customer accounts effectively.

With the integration of secure payment gateways and data analytics, EBMS not only facilitates seamless transactions but also enables better resource management and forecasting for electricity providers. This project addresses common challenges in traditional billing systems, promoting transparency and accessibility while paving the way for smarter energy consumption practices.

It also incorporates advanced features such as automated alerts and reminders, which help consumers stay informed about upcoming due dates and avoid late fees. Additionally, the system can generate monthly statements that highlight usage trends, allowing users to make informed decisions about their electricity consumption. By promoting awareness of energy usage patterns, the EBMS encourages users to adopt energy-saving practices, contributing to overall sustainability.

From a technical standpoint, the system is built on a scalable architecture, allowing for future enhancements and integrations with smart grid technologies. It utilizes a secure database to store user information and billing records, ensuring data integrity and protection against unauthorized access. The EBMS can be deployed on various platforms, including web and mobile applications, making it accessible to a wider audience. By providing a comprehensive and efficient solution for electricity bill management, this project aims to modernize the billing process and foster better relationships between consumers and utility providers.

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CHAPTER 1

INTRODUCTION

1. INTRODUCTION

The Electricity Bill Management System (EBMS) is a comprehensive framework designed to efficiently handle the billing, payment, and management aspects of electricity consumption for consumers. Given the growing demand for electricity and the challenges of managing large-scale billing operations, an automated and robust system is essential to ensure accurate billing, timely payments, and seamless consumer interaction. The EBMS plays a critical role in streamlining the entire process, from meter reading to invoice generation, making it a vital tool for electricity providers and consumers alike.

1.2 SCOPE OF THE WORK

The scope of work for the Electricity Bill Management System (EBMS) encompasses a wide range of functionalities and user interactions aimed at automating and streamlining the electricity billing process. The system will cater to different user groups, including consumers, administrators, and field operators. Consumers will have access to a user-friendly portal to view bills, monitor electricity usage, and make payments through integrated online payment gateways. Administrators will manage customer data, generate bills, and oversee system operations via a comprehensive dashboard, while field operators can input meter readings, whether automated or manual, to ensure billing accuracy.
Administrators will manage customer profiles, track consumption, generate bills, and access detailed reports on payment statuses and revenue trends. Field operators will input or verify meter readings, which will be crucial for accurate billing

1.3.AIM AND OBJECTIVE OF THE PROJECT

The aim of the Electricity Bill Management System (EBMS) project is to develop a comprehensive and efficient platform that automates the entire electricity billing process, from meter reading to payment collection. The primary goal is to eliminate manual errors, reduce administrative workload, and provide both consumers and utility companies with a seamless experience. By automating tasks such as bill generation, payment tracking, and consumption monitoring, the system will ensure accurate, timely, and transparent billing operations.

Objectives:

1. **Automate Billing Process:** To develop a system that automates the entire electricity billing process, from meter reading to bill generation, ensuring accurate and timely invoicing for consumers.

2. **Enhance Consumer Convenience:** To provide a user-friendly portal where consumers can easily access their electricity usage, view bills, make payments, and receive notifications regarding due dates and payment statuses.

3. **Reduce Administrative Workload:** To minimize the manual efforts involved in billing and payment tracking, allowing utility providers to focus on higher-level management tasks.

4. **Ensure Accurate Meter Readings:** To integrate automated meter reading (AMR) technology or manual input options for capturing precise electricity consumption data and reducing billing errors.

CHAPTER 2

SYSTEMSPECIFICATIONS

1. HARDWARE SPECIFICATIONS

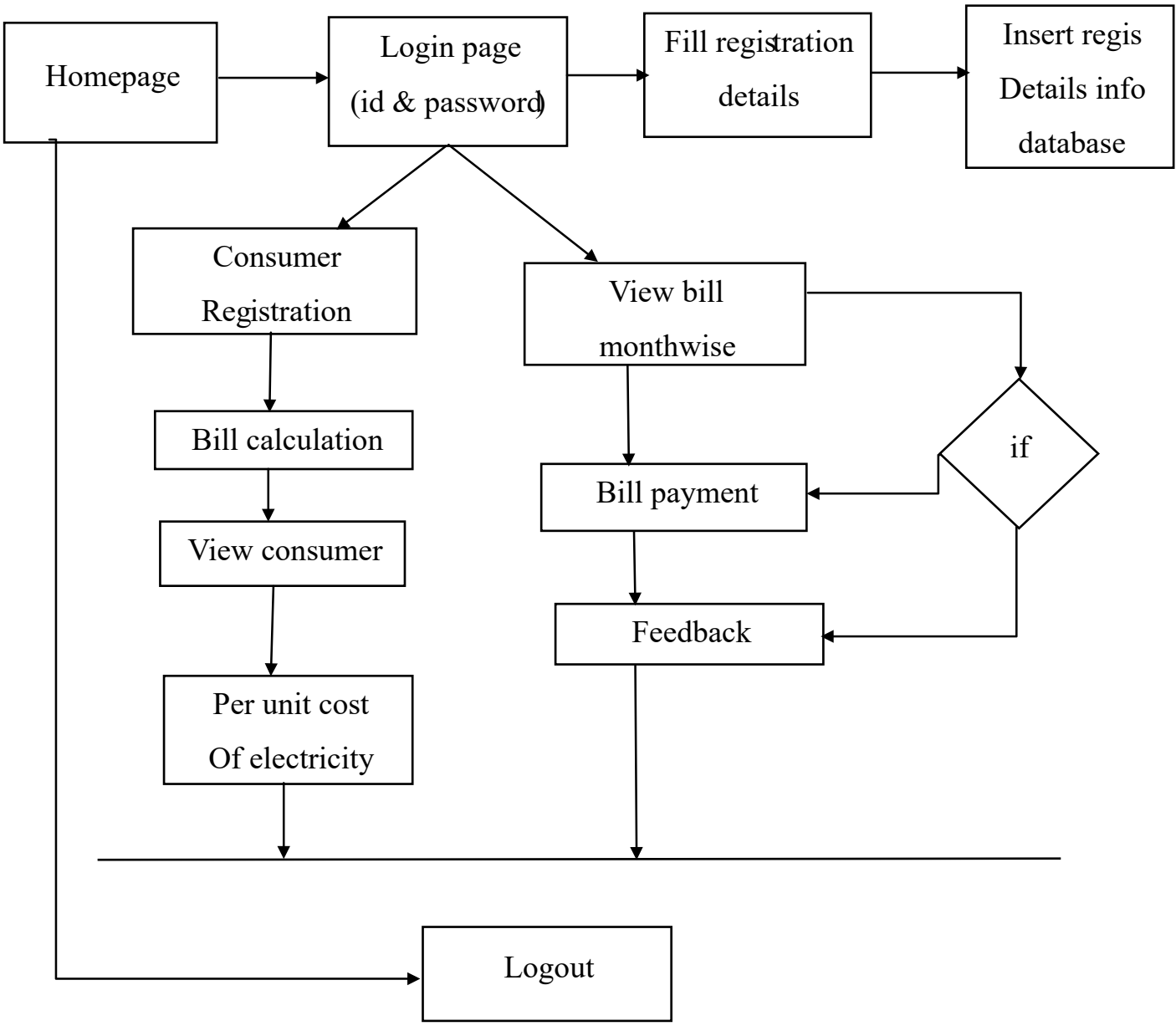
Processor	:	Pentium IV Or Higher
Memory Size	:	128 GB (Minimum)
HDD	:	40 GB (Minimum)

2. SOFTWARE SPECIFICATIONS

Operating System	:	WINDOWS 7 AND PLUS
Front – End	:	HTML, CSS,
Back – End	:	PHP, MYSQL

CHAPTER 3

ARCHITECTURE DIAGRAM



CHAPTER 4

MODULE DESCRIPTION

4.1. User Registration and Login Module:

The User Registration and Login Module for an Electricity Bill Management System plays a critical role in ensuring secure and smooth access for users. During registration, users provide essential information such as their name, email, phone number, address, and password. The system validates these inputs, ensuring that the email format is correct, the password is strong, and the email or phone number is unique. Upon successful registration, users receive a confirmation via email or SMS to verify their identity, ensuring that only verified users can log in.

4.2. User Testing Module:

The User Testing Module for an Electricity Bill Management System is critical to ensuring that the system functions effectively and meets user needs. It involves testing the system's usability, functionality, performance, and security with real users or testers simulating typical user interactions. The process begins with creating a detailed test plan and defining scenarios, such as user registration, logging in, bill payment, and profile updates. Functional testing ensures that these actions work as expected, while usability testing evaluates how intuitive and easy the system is to navigate for users.

4.3. Testing Status Module:

The Testing Status Module in an Electricity Bill Management System provides a real-time overview of the testing progress, tracking the status of all test cases across categories like functionality, usability, and security. It shows which tests have passed, failed, or are pending, and highlights critical issues that need attention. By offering transparency and monitoring the completion rate, this module ensures all stakeholders stay informed about the system's readiness for deployment and can act promptly to address any remaining problems.

4.4. Admin Module:

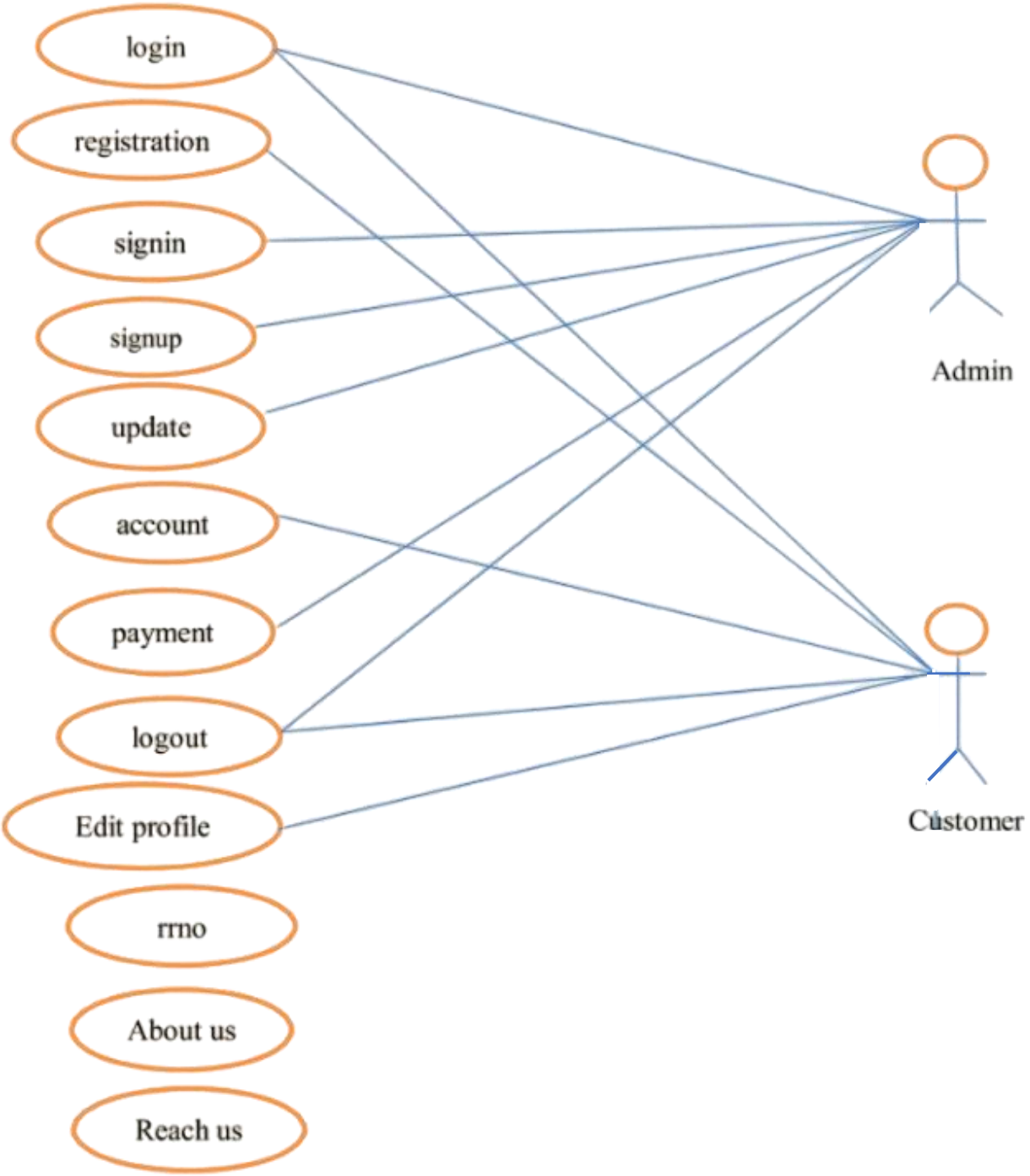
The Admin Module in an Electricity Bill Management System is responsible for managing the system’s core administrative functions and providing the tools necessary for administrators to oversee system operations. Through this module, admins can manage user accounts, handle billing operations, monitor payments, and generate reports. Key functionalities include the ability to add, update, or deactivate customer accounts, manage tariff plans, and adjust billing rates. Additionally, admins can oversee payment records, verify transactions, and resolve billing disputes.

The module also provides administrative access to generate system reports, such as total revenue, outstanding payments, and usage statistics. Security features like role-based access control are integrated to ensure that only authorized personnel can access sensitive areas of the system. The Admin Module ensures efficient management of the system's operational aspects, enabling administrators to maintain smooth and secure functioning of the entire electricity billing system.

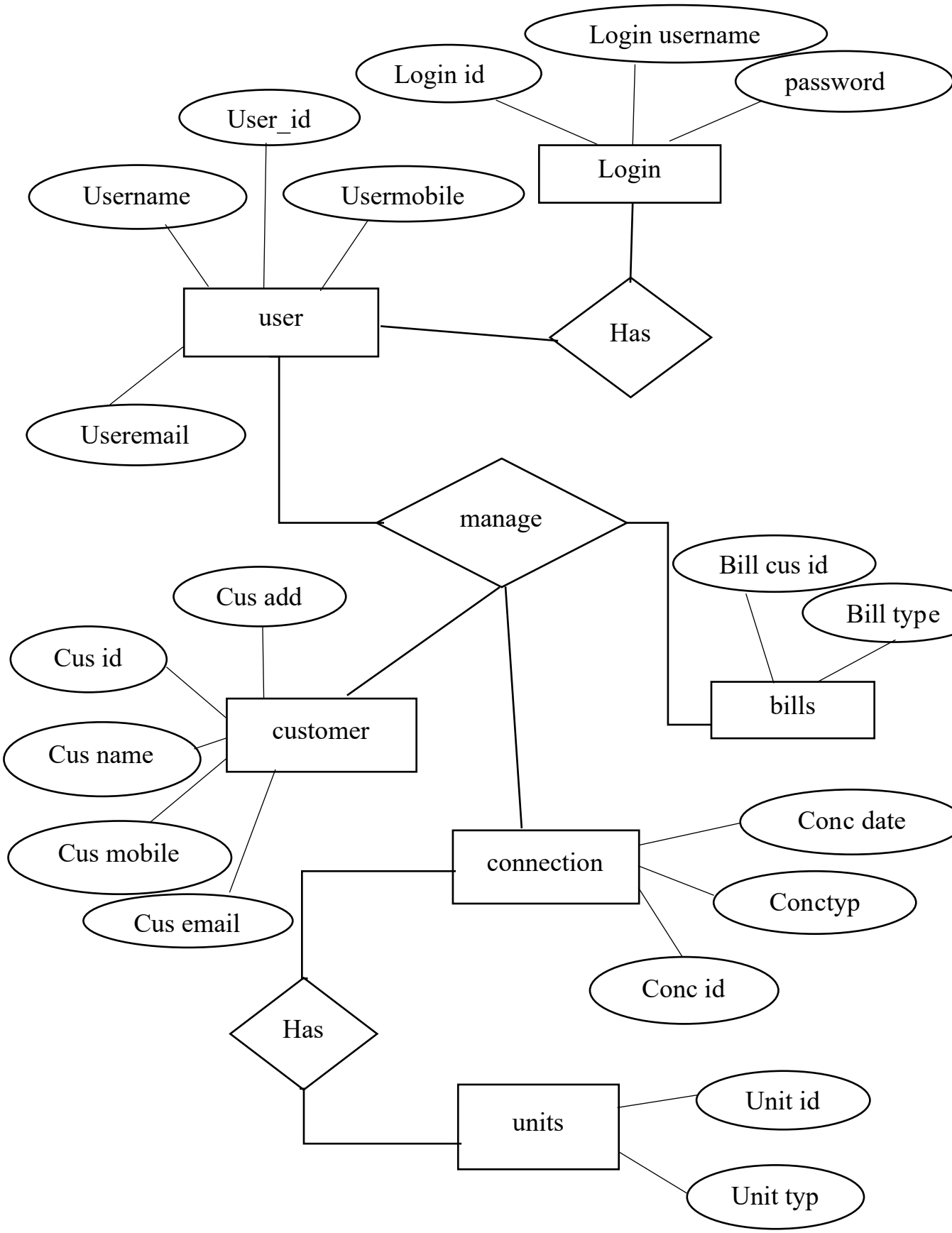
CHAPTER 5

SYSTEM DESIGN

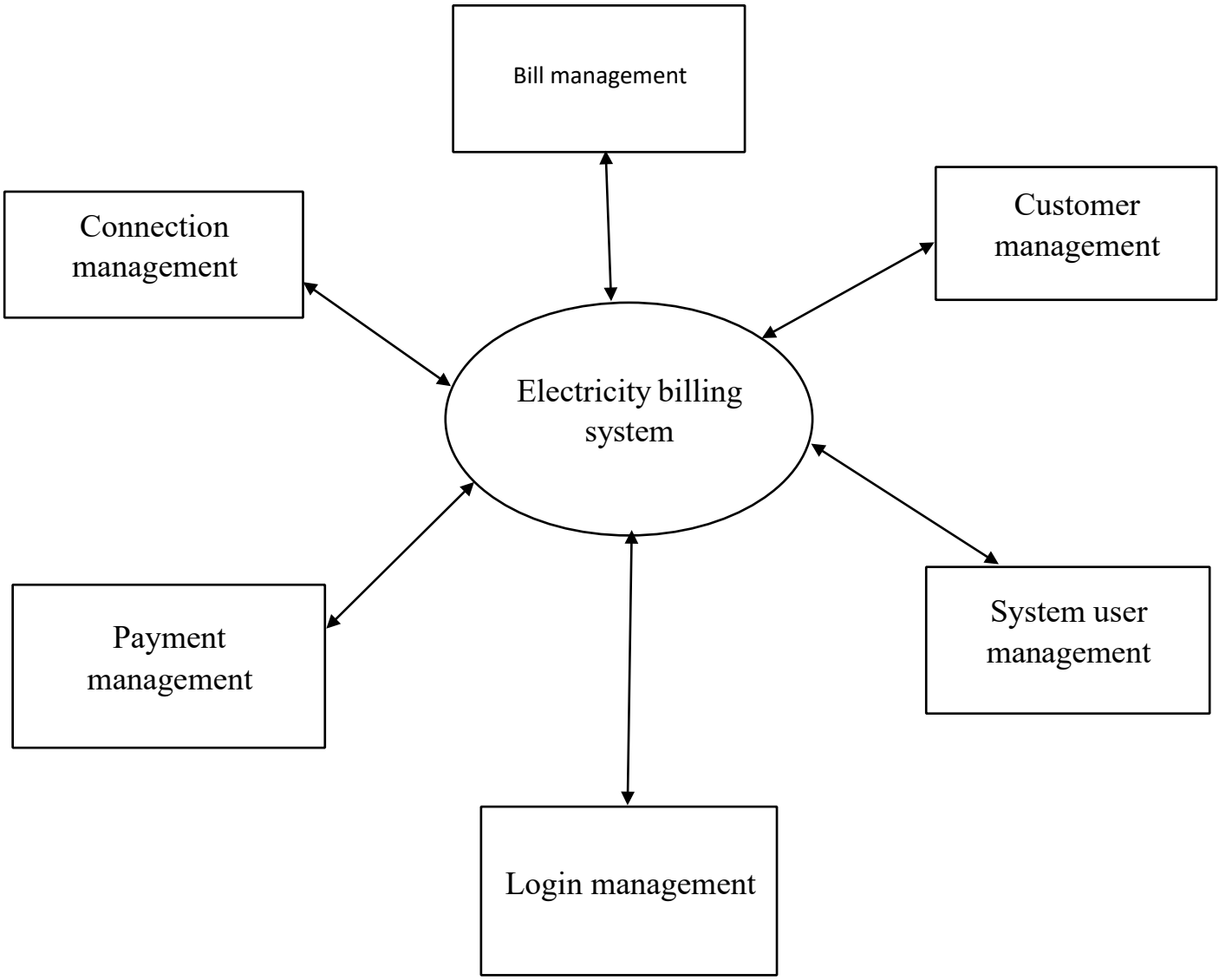
5.1 USE CASE DIAGRAM



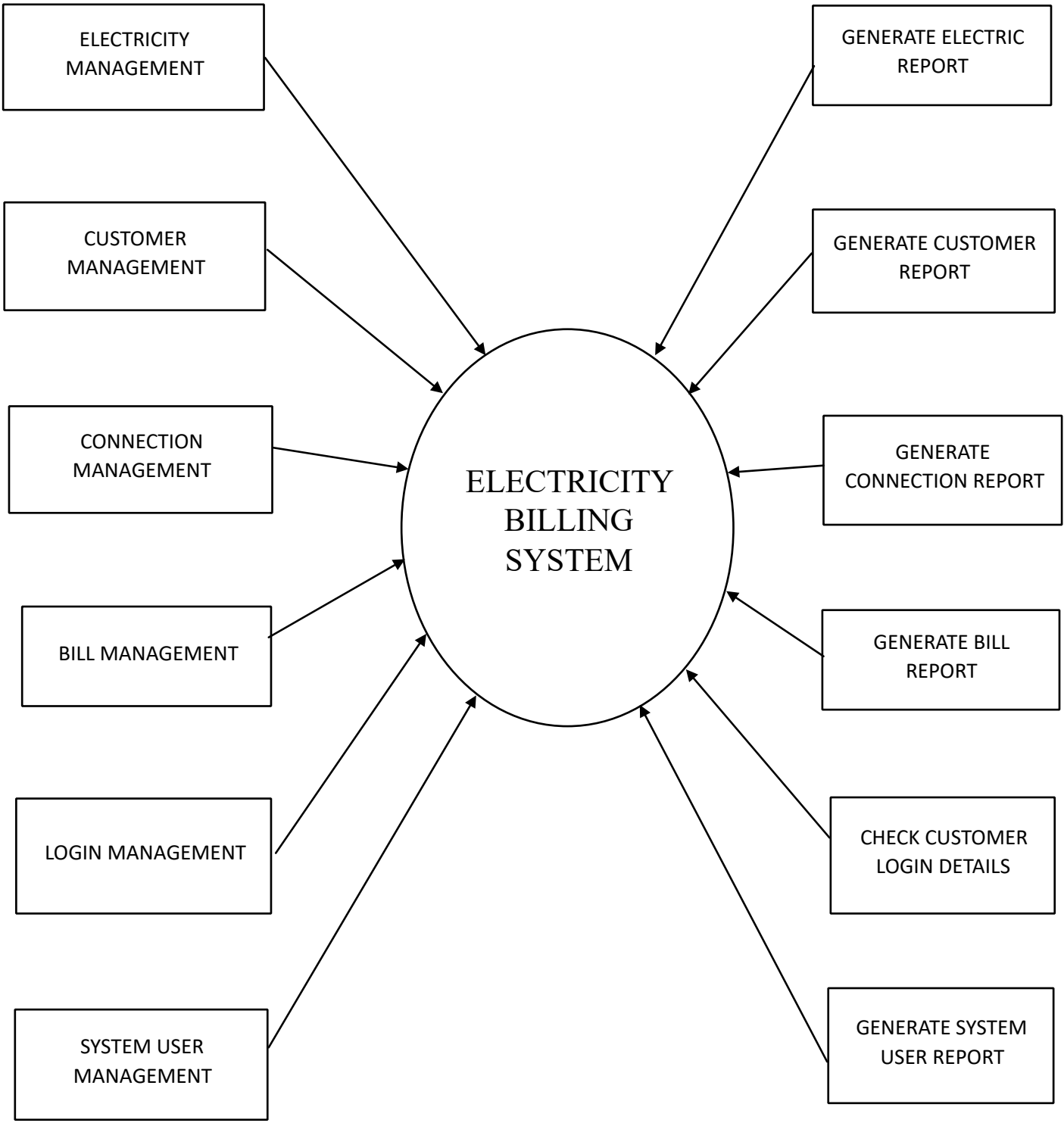
5.2 ER DIAGRAM



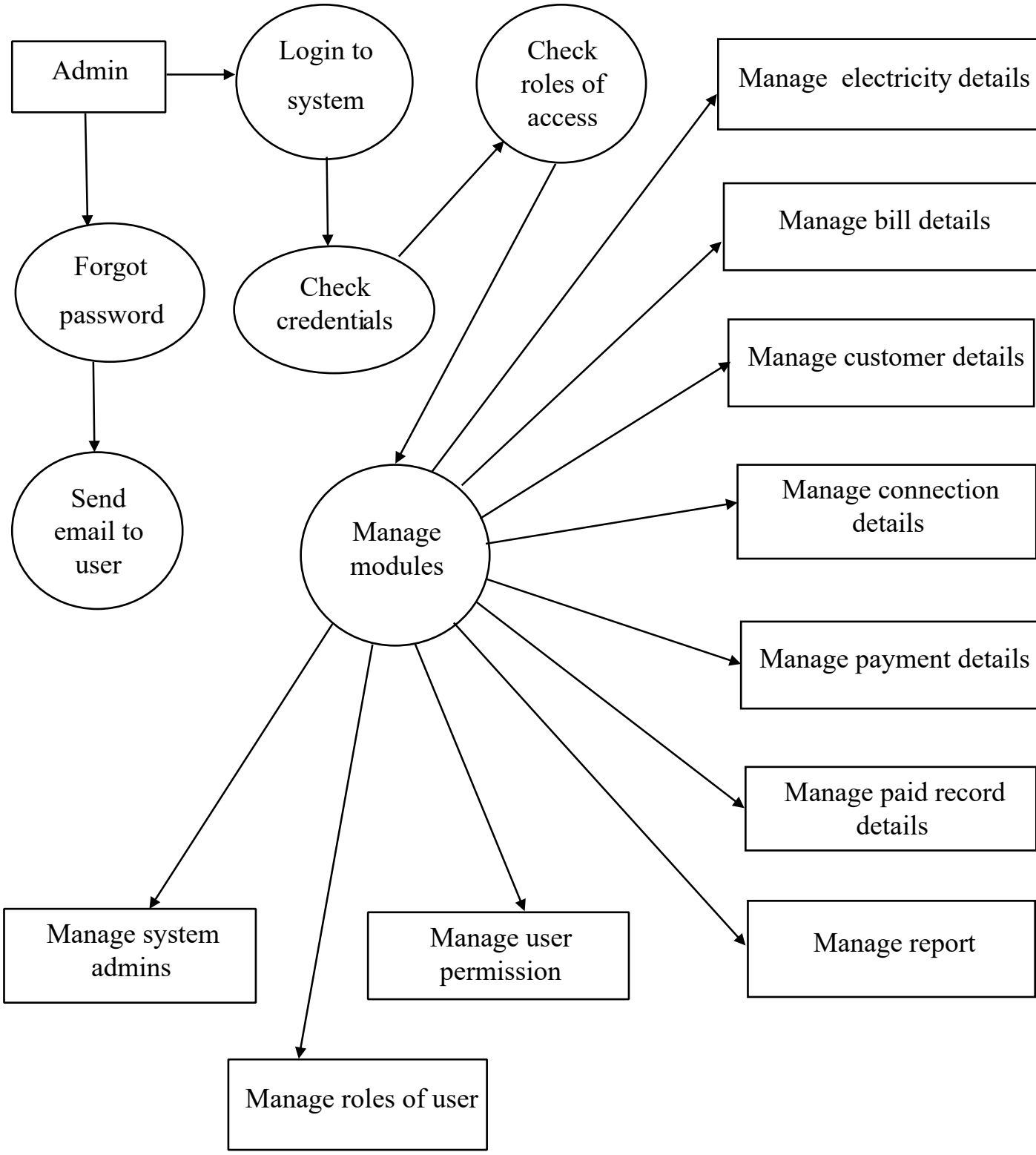
5.3. DFD DIAGRAM



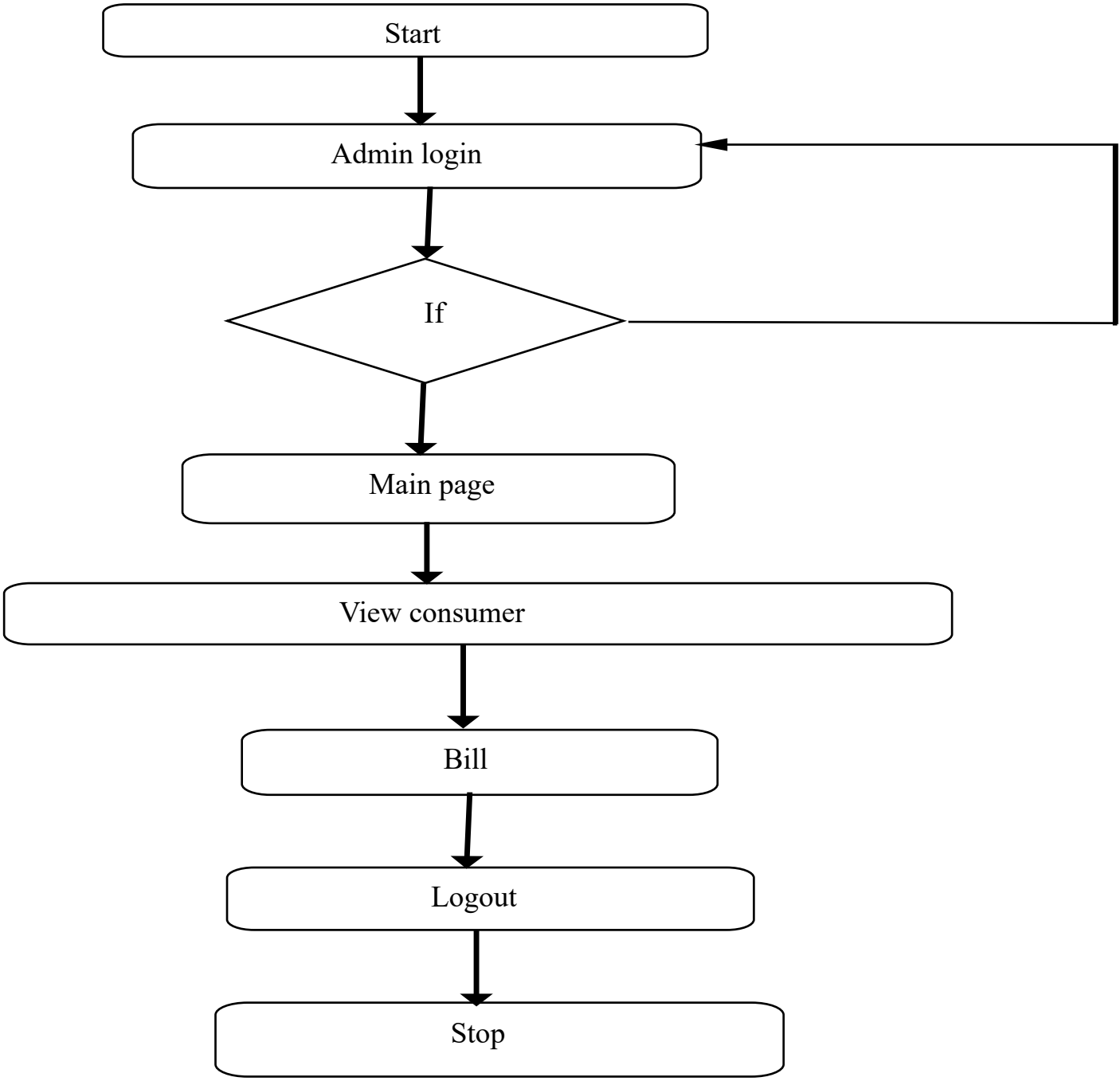
5.3.1. FIRST LEVEL DFD



5.3.2. SECOND LEVEL DFD



5.4. ACTIVITY DIAGRAM



CHAPTER 6

SAMPLE CODING

```
<?php
require_once("Includes/config.php");
require_once("Includes/session.php");

if(isset($_SESSION['logged']))
{
   if ($_SESSION['logged'] == true)
   {
      if ($_SESSION['account']=="admin") {
            header("Location:admin/index.php");
         }
      elseif ($_SESSION['account']=="user") {
            header("Location:user/index.php");
         }
   }
}

if(isset($_POST['login_submit'])) {
   if(!(isset($_POST['email']))) {
      if(!(isset($_POST['pass']))) {
         location('index.php');
      }
   }
}
?>

<!DOCTYPE html>
<html lang="en">

<head>
   <meta charset="utf-8">
   <meta http-equiv="X-UA-Compatible" content="IE=edge">
   <meta name="viewport" content="width=device-width, initial-scale=1.0">
   <meta name="description" content="">
   <meta name="author" content="">

   <title>Bolt</title>

   <!-- Bootstrap core CSS -->
   <link href="assets/css/bootstrap.css" rel="stylesheet">
```

```
    <link href="assets/css/font-awesome.min.css" rel="stylesheet">

    <!-- Custom styles for this template -->
    <link href="assets/css/main.css" rel="stylesheet">

    <!-- Fonts from Google Fonts -->
        <!--    <link    href='http://fonts.googleapis.com/css?family=Lato:300,400,900'
rel='stylesheet' type='text/css'> -->

    <!-- HTML5 shim and Respond.js IE8 support of HTML5 elements and media queries
-->
    <!-- WARNING: Respond.js doesn't work if you view the page via file:// -->
    <!--[if lt IE 9]>
      <script src="https://oss.maxcdn.com/libs/html5shiv/3.7.0/html5shiv.js"></script>
                                                                          <script
src="https://oss.maxcdn.com/libs/respond.js/1.3.0/respond.min.js"></script>
    <![endif]-->
</head>

<body>
    <!-- Fixed navbar -->
    <div class="navbar navbar-default navbar-fixed-top">
        <div class="container">
            <div class="navbar-header">
                 <button type="button" class="navbar-toggle" data-toggle="collapse" data-
target=".navbar-collapse">
                    <span class="icon-bar"></span>
                    <span class="icon-bar"></span>
                    <span class="icon-bar"></span>
                </button>
              <a class="navbar-brand" href="#"><i class="fa fa-bolt"></i><b>Bolt</b></a>
            </div>
            <div class="navbar-collapse collapse" >
                <?php include("login.php"); ?>
            </div>
            <!--/.nav-collapse -->
        </div>
    </div>

    <div id="headerwrap">
        <div class="darkhearderwrap">
            <div class="container">
                <div class="row">
                    <div class="col-lg-6 signup">
                        <h1>Electricity Bill<br>Management System</h1>
```

```
                    <p>This website at the end of its construction will act as a consumer oriented service for users for easy payment of their respective <b>Electricity Bill</b> as well as interact with their providers in case of any queries or grivances.</p>
                </div>
                <!-- /col-lg-6 -->
                <div class="col-lg-6">
                    <h1>Sign Up</h1>
                    <?php include("signup.php"); ?>
                </div>
                <!-- /col-lg-6 -->

            </div>
            <!-- /row -->
        </div>
        <!-- /container -->
        </div>
    </div>
    <!-- /headerwrap -->

    <div class="container">
        <div class="row mt centered">
            <div class="col-lg-6 col-lg-offset-3">
                <h1>How this Portal woks</h1>
                <h3>Lorem ipsum dolor sit amet, consectetur adipisicing elit. Eaque tempora esse, inventore asperiores necessitatibus porro, beatae dolore numquam odit voluptatum fugiat voluptatem doloremque et rem, repellat eum facere. Blanditiis, distinctio.</h3>
            </div>
        </div>
        <!-- /row -->

        <div class="row mt centered">
            <div class="col-lg-4">
                <img src="assets/img/ser01.png" width="180" alt="">
                <h4>1 - Login</h4>
                    <p>Lorem ipsum dolor sit amet, consectetur adipisicing elit. Assumenda impedit architecto a labore eum saepe fugiat ex culpa, ab dolor asperiores eligendi dolore temporibus, suscipit quo magni odio iusto quasi?</p>
            </div>
            <!--/col-lg-4 -->

            <div class="col-lg-4">
                <img src="assets/img/ser02.png" width="180" alt="">
                <h4>2 - Peruse Bills</h4>
```

```
            <p>Lorem ipsum dolor sit amet, consectetur adipisicing elit. Eveniet fuga deserunt similique, iure tenetur debitis perspiciatis, modi aut dolores illum iste, in error animi accusantium possimus rerum dolor facilis sequi.</p>

        </div>
        <!--/col-lg-4 -->

        <div class="col-lg-4">
          <img src="assets/img/ser03.png" width="180" alt="">
          <h4>3 - Transact</h4>
            <p>Lorem ipsum dolor sit amet, consectetur adipisicing elit. Quibusdam ducimus, vitae tempore recusandae explicabo sapiente eligendi voluptates repellat voluptatem porro. Facere porro, odit exercitationem, ducimus quis quam quasi id magnam.</p>

        </div>
        <!--/col-lg-4 -->
      </div>
      <!-- /row -->
    </div>
    <!-- /container -->

    <div class="container">
      <hr>
      <div class="row mt centered">
        <div class="col-lg-6 col-lg-offset-3">
          <h1>Bolt is for Everyone.</h1>
          <h3>Some descript goes here</h3>
        </div>
      </div>
      <!-- /row -->

      <! -- CAROUSEL -->
      <div class="row mt centered">
        <div class="col-lg-6 col-lg-offset-3">
                  <div id="carousel-example-generic" class="carousel slide" data-ride="carousel">
            <!-- Indicators -->
            <ol class="carousel-indicators">
                    <li data-target="#carousel-example-generic" data-slide-to="0" class="active"></li>
              <li data-target="#carousel-example-generic" data-slide-to="1"></li>
              <li data-target="#carousel-example-generic" data-slide-to="2"></li>
            </ol>
```

```
                <!-- Wrapper for slides -->
                <div class="carousel-inner">
                    <div class="item active">
                        <img src="assets/img/p01.png" alt="">
                    </div>
                    <div class="item">
                        <img src="assets/img/p02.png" alt="">
                    </div>
                    <div class="item">
                        <img src="assets/img/p03.png" alt="">
                    </div>
                </div>
            </div>
        </div>
        <!-- /col-lg-8 -->
    </div>
    <!-- /row -->
</div>
<! --/container -->
<?php
require_once("footer.php");
?>

<!--=========================JS============================== -->
<!-- Placed at the end of the document so the pages load faster -->
<!-- jQuery Version 1.11.0 -->
<script src="../assets/js/jquery-1.11.0.js"></script>
<script>
function validateForm() {
    var x = document.forms["myForm"]["email"].value;
    var atpos = x.indexOf("@");
    var dotpos = x.lastIndexOf(".");
    if (atpos< 1 || dotpos<atpos+2 || dotpos+2>=x.length) {
        alert("Not a valid e-mail address");
        return false;
    }
}
</script>

<!-- Bootstrap Core JavaScript -->
<script src="../assets/js/bootstrap.min.js"></script>
</body>

</html>
```

CHAPTER 7

SCREEN SHOTS

Fig. 7.1. About

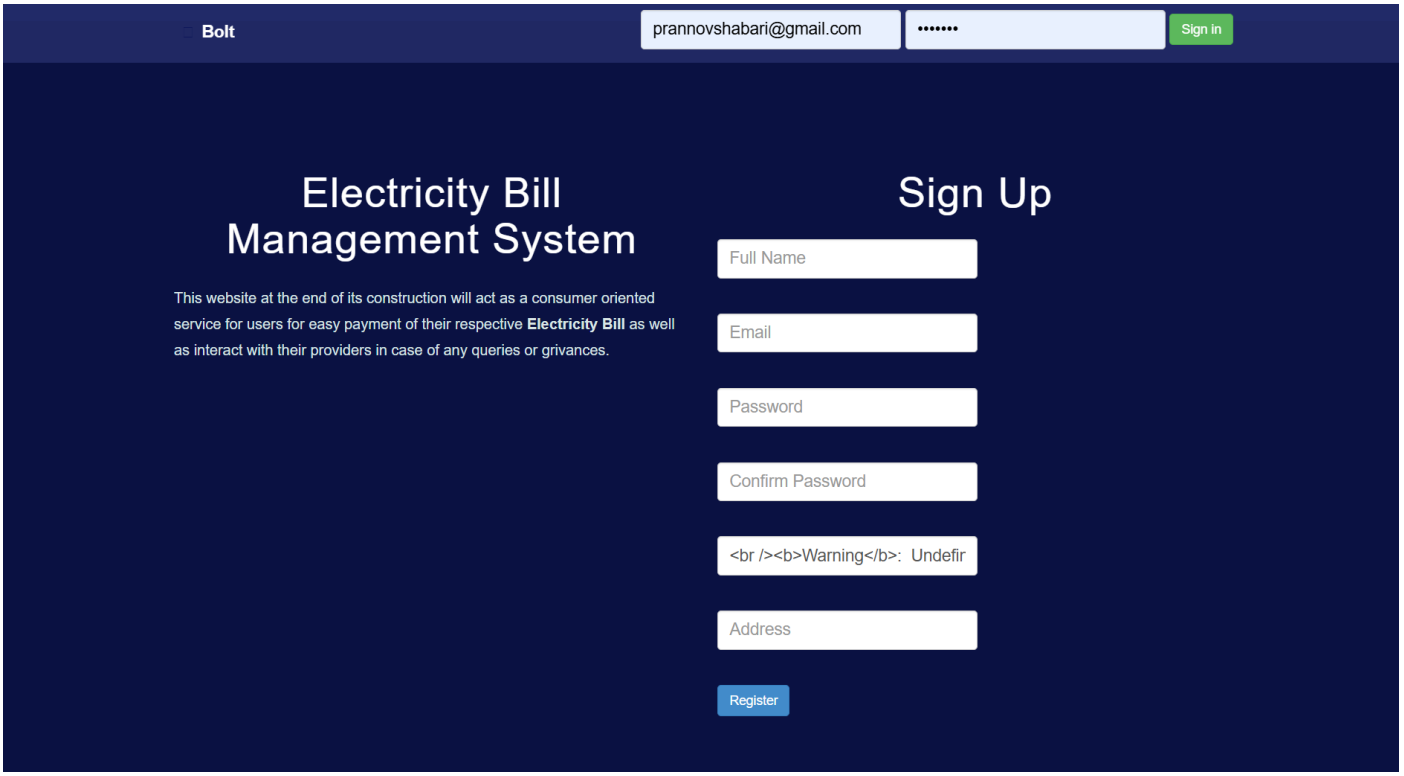


Fig.7.2. About

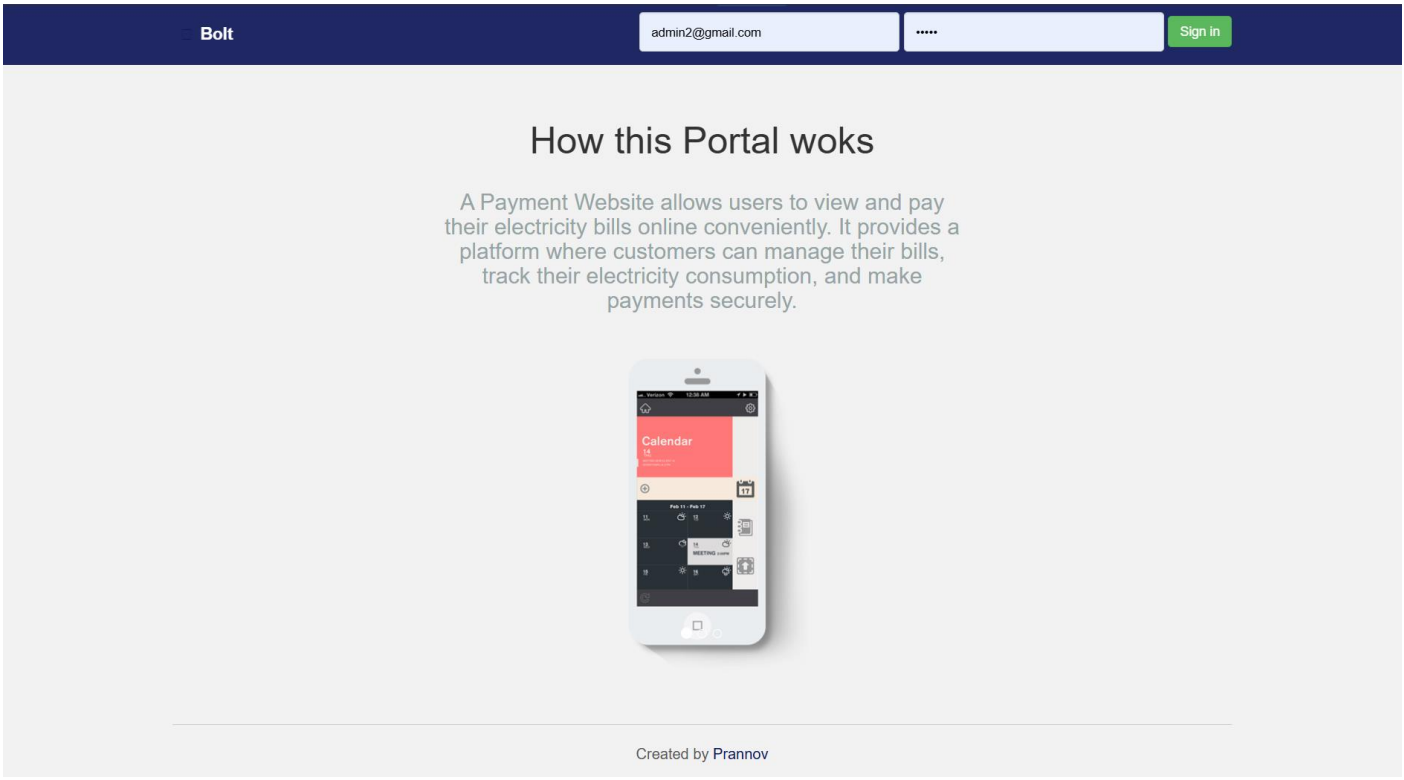


Fig.7.3. Admin Login

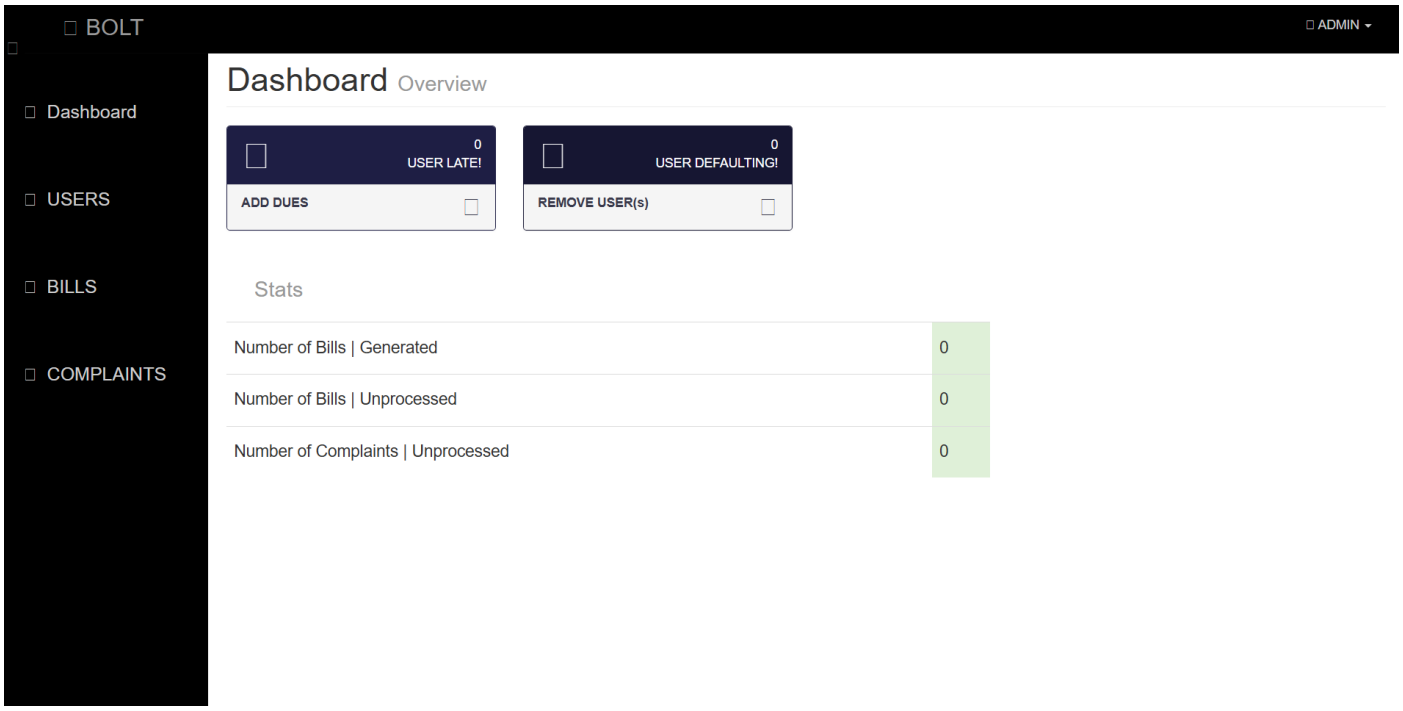


Fig.7.4. Admin

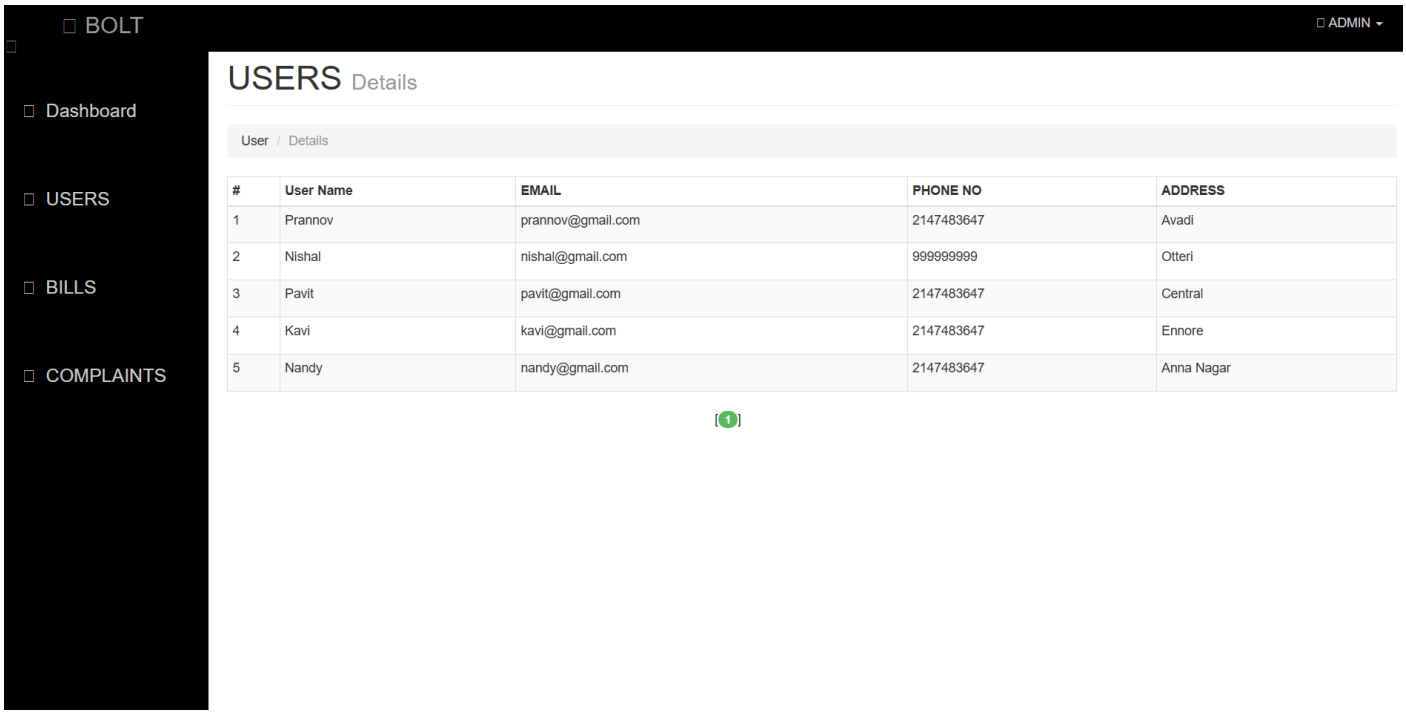


Fig. 7.5. User Dashboard

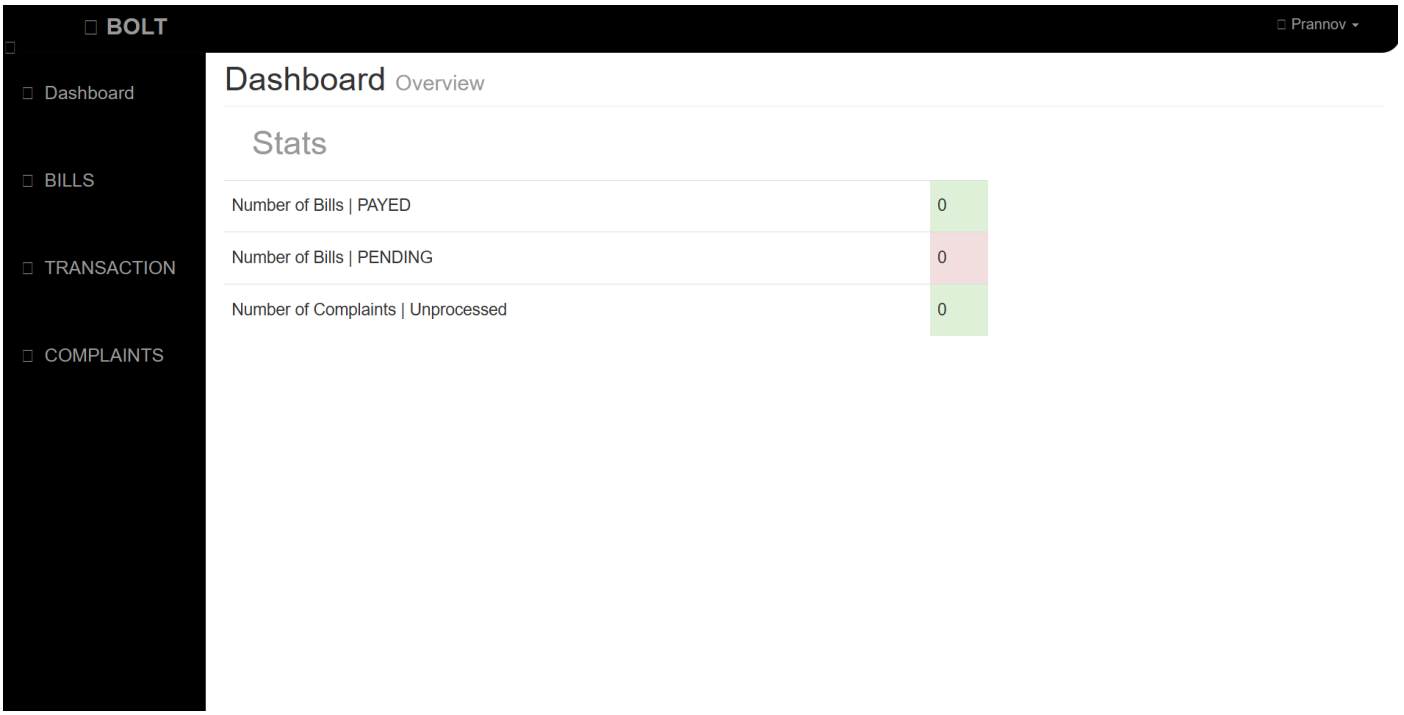
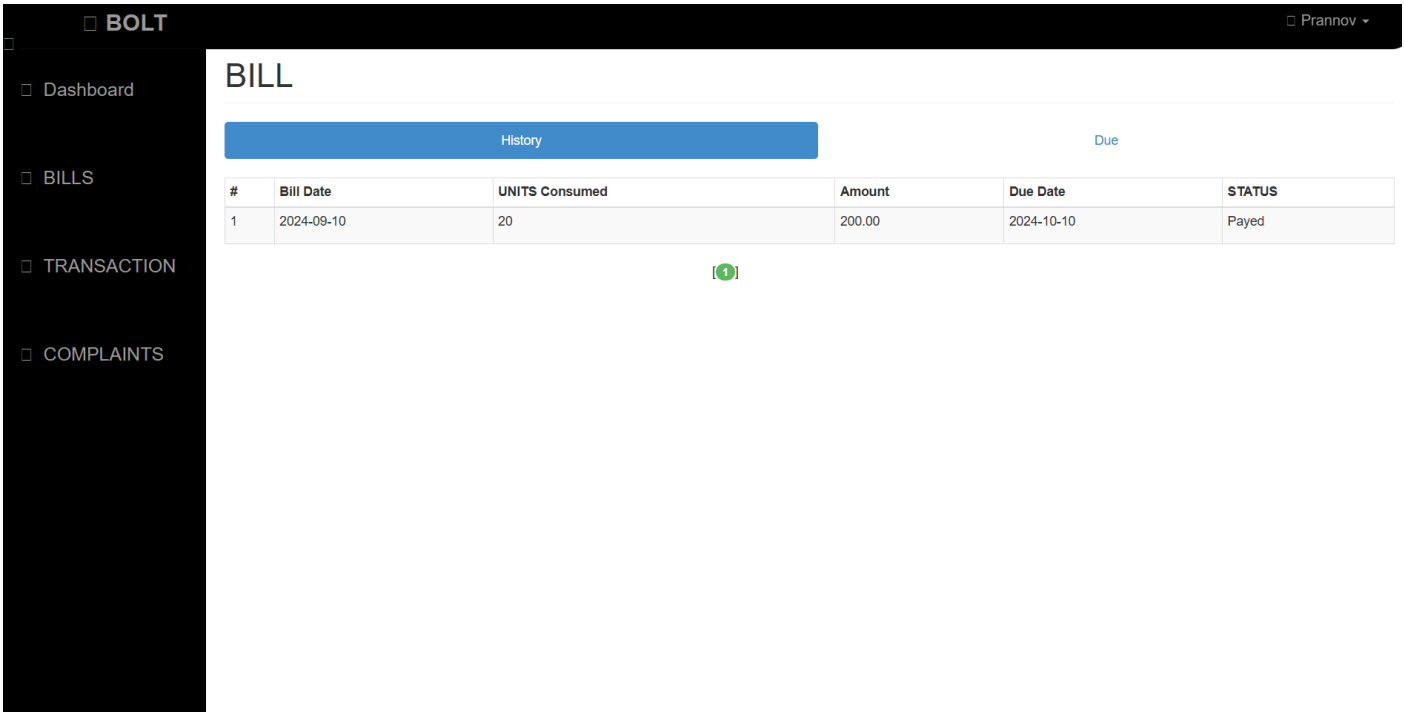


Fig.7.6. User Bills



CHAPTER 8

CONCLUSION

The Electricity Bill Management System is a robust and comprehensive platform designed to streamline the entire process of electricity billing and management, benefiting both customers and administrators. It integrates various essential modules, including secure user registration and login, allowing customers to easily create accounts, access their billing information, and make payments. The system's core functionality revolves around the efficient generation, tracking, and management of electricity bills, with automated calculations ensuring accuracy in billing based on consumption data. The Admin Module enables administrators to manage user accounts, oversee billing operations, update tariff plans, and monitor payments, providing complete control over the system.

In addition to handling routine operations, the system incorporates advanced testing capabilities, such as the User Testing and Testing Status modules, which ensure that every feature is thoroughly tested for functionality, usability, performance, and security before deployment. The Testing Status Module provides a transparent, real-time view of the progress of testing, helping developers and managers track the readiness of the system. Security features, including encrypted password storage, session management, and role-based access controls, ensure that sensitive customer data is protected, and unauthorized access is prevented.

Furthermore, the system’s user-friendly design, cross-device compatibility, and seamless integration with external services like payment gateways and notification systems make it highly efficient and accessible for a wide range of users. By automating various processes, such as billing generation, payment tracking, and report generation, the Electricity Bill Management System reduces manual errors, improves operational efficiency, and ensures timely payments. Ultimately, this system provides a scalable, secure, and reliable solution for managing electricity consumption and billing, benefiting electricity providers and customers alike.

REFERENCES

1. HTML , CSS , JS – www.w3schools.com
2. PHP, MYSQL – www.youtube.com
3. Product Details– www.amazon.in
4. Carousel Slider – www.glidejs.com
5. Font Awesome Icons – www.fontawesome.com
6. PHP Mailer - https://github.com/PHPMailer/PHPMailer
7. SweetAlert2 - https://sweetalert2.github.io/v10.html