



**Title of the Project: SECUREX**

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## APPROVAL

This Project titled "SECUREX", Submitted by MD Atikur Rahman, ID No: 192-16-451, to the Department of Computing & Information Systems, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computing & Information Systems and approved as to its style and contents. The presentation has been held on- 14-01-2023.

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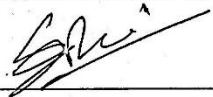
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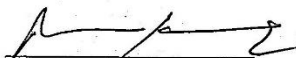
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## DECLARATION

I hereby declare that; this project has been done by me under supervision of Md. Mehedi Hassan, Lecturer, Department of Computing and Information System (CIS) of Daffodil International University. I am also declaring that this project or any part of there has never been submitted anywhere else for the award of any educational degree like, B.Sc., M.Sc., Diploma or other qualifications.

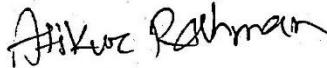
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## Acknowledgement

I want to begin by expressing my gratitude to the Almighty Allah for providing me this opportunity. I wouldn't be able to finish this undertaking without the assistance of the Almighty. Finally, I want to express my gratitude to DCL for selecting me as an intern trainee since this program has been very beneficial to me. A teacher is seen as a student's second parent since they provide them the right instruction, enabling them to advance in life. I had two teachers in my internship program who always gave me tips on how to make the best choices and how to effectively complete difficult jobs. They never let me face my challenges alone and continually relieved my tension by giving me the mental stamina I needed. Md. Mazharul Islam, one of them, is my intern trainer, while Md. Mehedi Hassan is the one who oversees my academic work.

In addition, I appreciate their politeness, willingness to provide a hand, and belief in me. I want to thank them for their assistance and guidance, teaching me how to overcome obstacles, and managing a significant project in the future.

## Dedication

This project is dedicated to Almighty Allah, followed by my Mom, Dad, elder brother and sister, who all made it possible for me to complete my BSC Program. I give glory and credit to Almighty God for supporting, protecting, and guiding me. I also thank God for the blessings that have come my way during my program.

## Abstract

SECUREX is a Content Management System that runs on the web. This system is constructed using a specified structure. The project aims to create a strong and user-friendly content management system (CMS) by providing useful tools and capabilities for content creation, editing, and publication to ease website content administration. SECUREX provides users with a centralized platform for successfully managing and updating the content of their websites. Productivity has risen, and content management methods have been streamlined. Website owners may better manage the accuracy and relevancy of the information provided to visitors now that it is easier to develop, edit, and publish material. SECUREX assists them in achieving actual value by providing them with a comprehensive content management system that increases productivity, stimulates collaboration, enhances functionality, and ensures data security. Visitors to the user's website will benefit from an enhanced user experience and access to current and relevant content due to this value.

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# Chapter 1 – Introduction

## 1.1 Introduction

In today's digital world, successfully managing content is critical to the success and growth of businesses across sectors. Implementing a robust Content Management System (CMS) becomes critical as organizations attempt to enhance their online presence, facilitate information exchange, and create great user experiences. This project focuses on establishing a cutting-edge CMS system to empower our employees, improve collaboration, and provide our target audience with seamless digital experiences.

With the exponential increase of digital content, successfully managing it has become a challenging problem. A robust CMS is a centralized center allowing content producers, editors, and administrators to develop, organize, and publish materials effortlessly. By introducing a CMS system, SECUREX, we intend to simplify content workflows, increase content discovery, assure consistency, and improve the overall user experience.

The primary fundamentals of the CMS project are as follows:

**Centralized Content Management:** This CMS system will offer a unified platform for storing and managing diverse content assets such as documents, photos, videos, and web pages.

**Improved Collaboration:** Successful content management is built on collaboration. We will support seamless collaboration among content authors, editors, and stakeholders via the CMS. Real-time editing, commenting, and workflow management will allow teams to collaborate more effectively, assuring speedy content development and approval procedures.

**Superior User Experience:** We will focus on providing great user experiences in our CMS. We will engage and fascinate our audience with accessible interfaces, tailored content distribution, and responsive design. By exploiting the CMS's features, we hope to give consumers easy navigation, relevant suggestions, and consistent branding across all digital touchpoints.

Governance and scalability are critical for ensuring brand consistency and conforming to regulatory norms. Our CMS will enforce content governance standards, branding guidelines, and

access restrictions to guarantee that content corresponds with our organization's ideals, works with legislation, and scales with our expansion.

## 1.2 Scope

- The CMS program will include an easy-to-use interface and simple capabilities to help producers and editors create engaging, high-quality content.
- The user will be able to arrange their content assets methodically. The program will let users create and manage various categories, tags, and metadata for their material, allowing for easier browsing and discovery.
- The CMS application will make collaborating easier for content authors, editors, and other stakeholders in the content production process.
- The program will allow us to publish material in real-time across many platforms, such as websites, social media channels, and mobile applications.
- User authentication and authorization techniques will improve security and safeguard sensitive data.

## 1.3 Document Contents

This documentation will cover the following chapters to outline the project's actions.

### **Chapter 1: Introduction**

The SECUREX and project's preliminary synopsis is provided below.

### **Chapter 2: Initial Study**

I will explain why a new system must be built in the first research, the history of a CMS system, and the answer to this particular problem.

### **Chapter 3: Literature Review**



In the literature review chapter, I will go into more depth about the issue area and the solution to this particular problem. I will also contrast the leading solution to the same issue that is currently in use. I will suggest a few strategies for the particular SECUREX system.

#### **Chapter 4: Methodology**

I will go through a few SECUREX-related approaches in this part. Then I will provide an approach that works for SECUREX and describe how I will use it in this project.

#### **Chapter 5: Planning**

In the planning part, I will describe the project plan, including the work breakdown structure, resource allocation, creation of a Gantt chart for this project, and time boxing.

#### **Chapter 6: Feasibility**

The SECUREX project's full feasibility study and cost-benefit analysis will be completed at this stage.

#### **Chapter 7: Foundation**

This section will discuss the requirements, issue area identification through data collection methods, and technological implementation choices.

#### **Chapter 8: Exploration**

The project's use case, activity diagram, requirement catalogue, and new system prototype are all included in this section.

#### **Chapter 9: Engineering**

The engineering chapter will incorporate the suggested diagram and the new systems interface design.

#### **Chapter 10: Deployment**

This part will also include a core module development coding sample, an analysis of the SECUREX challenge, and a priority list for the project's development.

#### **Chapter 11: Testing**

This part will test the SECUREX system, including unit, integration, and module testing.

### **Chapter 12: Implementation**

This chapter will address a variety of implementation strategies in addition to the training session.

### **Chapter 13: Critical Appraisal and Evaluation**

This section will discuss each necessary evaluation and appraisal.

### **Chapter 14: Lessons Learned**

The issues I ran across, and the lessons I discovered while working on the project will be addressed.

### **Chapter 15: Conclusion**

The project overview and an explanation of the experience will both be included in this section.

## Chapter 2 – Initial Study

### 2.1 Background

In today's digital world, efficient content management has become critical for enterprises across all industries. CMSs have evolved as solid tools for facilitating digital material development, organization, and distribution. A content management system (CMS) is a software program that allows users to produce, update, and publish information in real-time, providing a centralized platform for content management.

CMS had evolved from the early days of the internet when websites were primarily static and required human scripting for changes. Developers noticed the need for more effective content management systems as the need for dynamic and often updated information expanded. This resulted in the creation of early CMS systems that allowed users to generate and alter online content using simple interfaces, removing the need for technical knowledge.

CMS platforms have evolved to include additional features and functionality. They include various features like content versioning, workflow management, multisite administration, e-commerce integration, and search engine optimization. By providing versatile and configurable solutions, open-source CMS frameworks like WordPress, Joomla, and Drupal have spurred the growth and acceptance of CMS.

When determining customers that require a CMS, we should consider the following:

- CMS may help organizations of all sizes and sectors.
- Customers have distinct content management requirements, including website content, blog pieces, product information, news updates, and multimedia assets.
- Examine the CMS platform's scalability, adaptability, and usability.
- Consider customization possibilities to match the CMS to individual needs.
- To guarantee seamless data flow, evaluate integration possibilities with current systems.
- Consider the CMS's security measures for protecting critical information.
- Ensure that continuous technical assistance for troubleshooting and upgrades is available.

A CMS provides various advantages to its users. To begin with, it enables non-technical individuals to generate and manage content without the need for web developers or IT employees. This promotes a more flexible content generation process, allowing faster updates and less reliance on external resources.

A CMS also makes it easier for team members involved in content generation and publication to collaborate. It enables centralized content repositories, version control, and workflow management, speeding the content creation process and enabling seamless collaboration.

There is an increasing demand for effective content management in the digital age. Our CMS solutions will enable users to streamline content workflows, increase productivity, and provide interesting and relevant material to their audience by delivering intuitive interfaces, organizational capabilities, collaborative tools, and flexible publishing choices.

## 2.2 Problem Area

Since joining the Internship Program, I have understood that organizations frequently face crucial issues that impede their operations and capacity to achieve their potential. Throughout the internship program, I have encountered various cases when clients have had severe organizational problems. One client discussed their challenges, outlining a series of interrelated issues that had a detrimental influence on their operations.

First, the client voiced dissatisfaction with the inability to retain and manage consumer information effectively. This shortcoming has failed to distinguish between existing and new clients, resulting in wasted possibilities for focused engagement and tailored experiences. As a result, the client's customer retention has decreased, negatively impacting their business development.

Second, the customer outlined their difficulties in coordinating and automating company procedures. The lack of an effective system has made it difficult to carry out activities orderly and streamlined. This lack of structure has led to inefficiencies, delays, and higher operating expenses, limiting clients' ability to attain their intended profit margins.

Finally, the client stressed the need to maximize customer relations. They have realized that their existing method is not engaging customers or providing a satisfying experience. This constraint has had an impact on consumer happiness and the overall performance of the company.

## 2.3 Possible Solution

Following an in-depth analysis of the highlighted issue areas, it is clear that adopting a complete Content Management System (CMS) can be a feasible solution. A CMS provides various features and capabilities to help organizations manage specific difficulties, such as managing customer information, organizing and automating operations, and enhancing customer interactions.

Businesses may use a CMS to organize and effectively store structured consumer information. Details such as contact information, purchase history, preferences, and interactions are included, allowing businesses to obtain essential insights into their clients and customize their experiences [1].

A CMS also includes solutions for simplifying and automating critical business operations. It enables firms to design processes, automate repetitive operations, and construct effective team collaboration methods. This guarantees that work is completed more organized and timely, eliminating mistakes and increasing overall operational efficiency [2].

Businesses may address the issues indicated in the problem area using a CMS, which allows them to efficiently store and manage customer information, simplify operations, automate procedures, and maximize customer interactions. As a result, customer satisfaction and productivity, and corporate success will improve.

## 2.4 Objective

The objectives of the SECUREX project are as follows:

- Create a dashboard that addresses organizations' particular demands and issues while managing content successfully.

- Create a user-friendly interface that enables simple content creation, editing, and categorization, allowing organizations to manage their digital assets more efficiently.
- Allow for broad customization, allowing businesses to customize the CMS to their needs and identity.
- To improve productivity and expedite procedures, provide seamless interaction with other company systems and third-party apps.
- Enhance the user experience by emphasizing simplicity, responsiveness, and accessibility in the CMS's design and functionality.

## Chapter 3 – Literature Review

Much has been talked about adopting and using Content Management Systems (CMS) in Bangladesh in recent years. CMS solutions have become crucial tools for strengthening online capabilities and improving company efficiency as enterprises and organizations in Bangladesh increasingly appreciate the value of digital presence and good content management.

CMS has various benefits, including easier content generation, editing, and publishing, allowing organizations to manage their websites and digital platforms more efficiently. Furthermore, CMS gives businesses greater control over their content, assuring consistency and accuracy across several media. Furthermore, using a CMS has resulted in more incredible content organization, lower maintenance costs, and improved website performance for SMEs. User-friendly CMS interfaces and thorough technical assistance are required to promote the effective adoption and deployment of CMS among Bangladeshi SMEs.

Moreover, the Bangladeshi government has acknowledged the significance of CMS in developing and expanding the country's digital economy. The government's "Digital Bangladesh" effort stresses using technology to improve governance, service delivery, and information management. CMS contributes significantly to this endeavor by helping government entities to properly manage and disseminate information via their websites and online portals.

### 3.1 Discussion on Problem Domain

CMS has evolved into a critical tool for managing and delivering digital information. They provide a user-friendly interface that makes creating, organizing, and updating website material easier. CMS projects, on the other hand, confront a variety of problems within the issue domain that must be addressed for successful installation and usage. This section will examine the significant issues in CMS initiatives and their importance.

**Complexity of Content:** Modern websites contain a variety of content kinds, such as text, photos, videos, and interactive components. Managing and organizing such complicated stuff might be

challenging [3]. CMS projects must include practical methods for managing various media types, allowing for simply uploading, editing, and embedding multimedia files within the system. Sophistic content management skills are required to enable smooth content generation and distribution.

**User Experience:** One of the critical goals of a CMS is to enable non-technical users to manage material effortlessly. However, many CMS solutions provide a poor user experience, limiting productivity and adoption. It is critical to provide simple, user-friendly interfaces allowing content producers and editors to navigate the system quickly. Customizable dashboards, streamlined workflows, and simple content creation and editing tools are critical for improving user experience [4].

**Scalability and Performance:** Content volume and user traffic on websites frequently increase over time. CMS projects must solve scalability and performance issues to manage rising traffic and maintain optimal website performance. This entails developing caching methods, optimizing database queries, and deploying scalable infrastructure to maintain a consistent user experience even during peak traffic.

**Integration and interoperability:** Businesses rely on various systems and apps to handle various elements of their operations. CMS initiatives must provide easy interaction and interoperability with tools and technologies, including customer relationship management (CRM) systems, e-commerce platforms, and analytics solutions. Robust APIs and connectors should be built to facilitate data transmission and synchronization between the CMS and other systems.

**Security and Compliance:** In CMS initiatives, data security and compliance are key issues. CMS systems must adopt adequate security measures to secure sensitive information due to the growing volume of digital material and the evolving threat landscape. User access restrictions, encryption techniques, and frequent security upgrades are required to prevent unwanted access and maintain compliance with data privacy rules. Adhering to industry standards and best practices instills trust in users and protects the CMS's integrity.

### 3.2 Discussion on Problem Solutions



The need for efficient and effective website content management and updating was highlighted as a problem. Our project implements a complete Content Management System (CMS) with various unique solutions to overcome this issue.

- Our CMS addresses the issue by providing a user-friendly interface simplifies content administration. Website owners and administrators can create, update, and organize their material using a simple and intuitive editor, eliminating the need for technical experience or coding knowledge. This gives consumers complete control over their website content and eliminates needing external web developers or IT teams.
- Our CMS's flexibility and scalability are two of its primary benefits. It supports a wide range of websites kinds, including personal blogs, e-commerce platforms, and business websites. Users may establish a distinctive online presence corresponding to their business identity by selecting from various configurable templates, themes, and layouts. This guarantees that each CMS-built website is unique and visually attractive.
- Our CMS has sophisticated user administration tools in addition to content production and modification. Administrators may assign diverse users distinct roles and access levels, ensuring an organization efficiently allocates content production and editing duties. This increases cooperation and security by restricting access to crucial website regions.
- Another noteworthy aspect of our CMS is its extensive media management system. Users may easily upload and manage photographs, movies, and other media items within the CMS. They may also optimize media assets for faster download times, add alt text and captions for better SEO, and ensure a visually appealing website across devices and platforms.
- Moreover, our CMS has built-in commenting features to encourage user participation and discussion. Commenting on pages and posts allows for debate, feedback, and community building. This interactive element improves the overall user experience and fosters a sense of belonging among visitors to the website.

### 3.3 Comparison of the Leading Solutions

When comparing our CMS to the leading systems on the market, it is critical to examine the unique features and benefits that our CMS offers. While WordPress, Joomla, and Drupal are popular CMS platforms, our solution distinguishes out in terms of usability and customization choices.

WordPress is one of the market's leading CMS platforms, with a massive user base and various plugins and themes. WordPress is well-known for its adaptability and scalability, making it suited for various website kinds [5]. One disadvantage of WordPress is that it relies on forums, tutorials, and documentation for customer assistance.

Joomla is another well-known CMS platform with excellent capabilities and adaptability. It powers over 2% of all websites and offers a variety of content management tools [6]. While Joomla is well-known for its capabilities, it may be more difficult for novices to grasp and require a learning curve to utilize its features correctly. In contrast, our CMS system focuses on usability and delivers a user-friendly interface that facilitates content administration for users of all skill levels.

Furthermore, our CMS system emphasizes media management, allowing users to easily upload, organize, and optimize various media assets. This feature increases website aesthetic appeal and loading times across devices and platforms. While other CMS systems may have media management functions, our solution seeks to give a streamlined and user-friendly experience when dealing with multimedia material.

### 3.4 Recommended Approach

While our CMS system already has several impressive features, a few more techniques might improve its capabilities and create an even better user experience. These recommendations are based on growing CMS trends and user preferences.

- Interactive Visual Editor
- Integrated Analytics Dashboard
- E-commerce Integration
- Collaboration and Workflow Management
- Mobile App Integration

## Chapter 4 – Methodology

The Software Development Life Cycle (SDLC) is a methodical strategy used to manage the whole process from the original concept to the final software product deployment. It consists of a collection of well-defined phases, procedures, and best practices that enable the completion of software projects successfully. The SDLC provides a framework for managing and controlling software projects, ensuring they fulfill client needs, conform to quality standards, and are delivered on time and within budget. Following a well-defined SDLC allows firms to reduce risks, increase productivity, and improve the overall quality of the software being built. The SDLC typically includes the following phases: requirements collecting, system analysis, design, coding, testing, deployment, and maintenance. These phases are interrelated and follow a logical order, allowing stakeholders, development teams, and quality assurance employees to collaborate efficiently. Several criteria, including project scope, team size, timetable, and client needs, determine the SDLC technique used. Waterfall, Agile, Scrum, and DevOps are some common SDLC approaches. Each methodology has distinct qualities and benefits that cater to various project circumstances and organizational objectives.

### 4.1 What to Use

Choosing a suitable Software Development Life Cycle (SDLC) model is critical for effective software development and delivery. It guarantees that the development process matches project requirements, efficiently controls risks, maximizes resource use, allows accurate time and cost prediction, accommodates modifications, and fosters stakeholder participation. Organizations can increase the chance of successful software project delivery by considering these aspects. The joint application development model (JAD), agile software development model, prototype model, dynamic systems development model (DSDM), waterfall model, and rapid application development model (RAD) are examples of software developers. Now it is time to learn about the benefits and drawbacks of the models mentioned above, and I will go through three of them.

## Waterfall Model

The Waterfall model is a software development process that is linear and systematic. It takes a methodical approach, completing each phase of the development process before going on to the next. Requirements gathering, system design, implementation, testing, deployment, and maintenance are among the steps. The Waterfall approach has the advantage of being simple since it gives a clear roadmap for the development process. However, because changes in requirements are challenging to accept once a phase is done, its rigid and inflexible character might be a drawback. This paradigm is appropriate for projects with well-defined and consistent needs.

The phases of the Waterfall Model are shown in the following diagram:

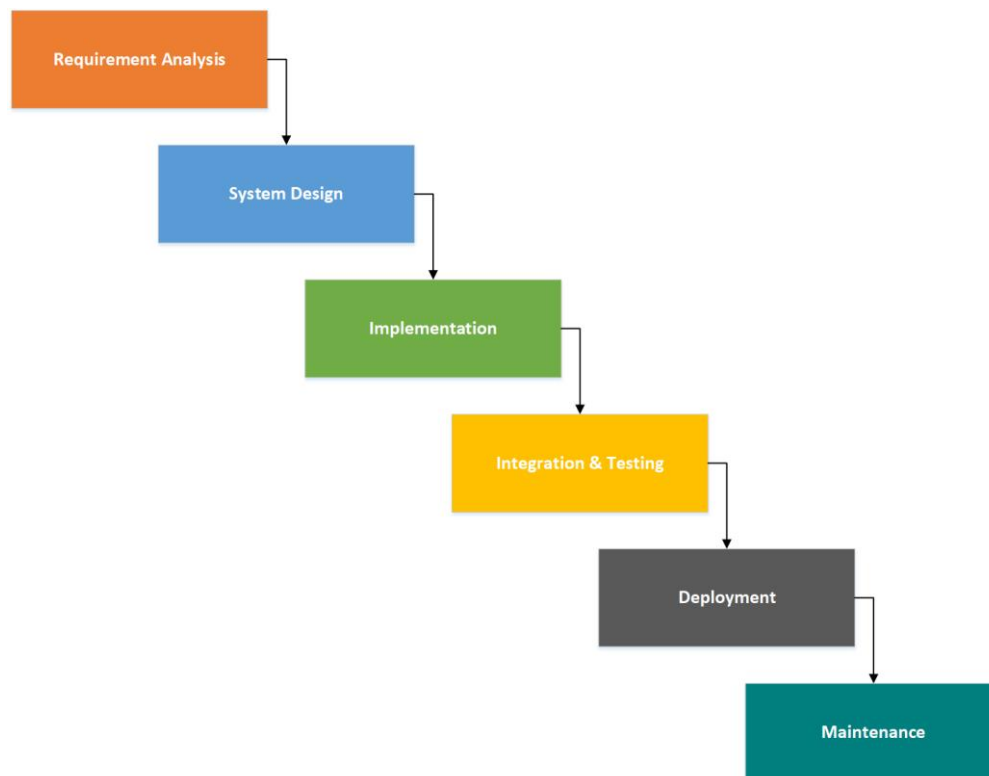


Figure 4. 1: Waterfall Model

## **Advantages of Waterfall Model**

- Clear and well-defined project needs from the start.
- Because of its simplicity, it is simple to grasp and apply.
- Gives a detailed plan for the development process.
- Each phase includes its own set of deliverables and milestones, making it easy to monitor progress.
- Ideal for projects with consistent and well-defined criteria.
- Documentation is prioritized, ensuring thorough project documentation.

## **Disadvantages of Waterfall Model**

- Once a phase is done, there is little room for alterations or revisions.
- Customer input was lacking during the development process.
- Because the whole process is planned, it is inefficient in dealing with changing requirements.
- It is not easy to estimate time and expense at the start precisely.
- Testing is often done towards the end, which may result in late detection of flaws.
- Relying on documentation can cause delays and make it harder to adjust to changes.

## **V Model**

The V model is a Waterfall-based extension that stresses testing and verification throughout the development life cycle. It forms a V-shaped structure by associating each development process step with a matching testing phase. The V model has the benefit of focusing on testing and early discovery of errors, which helps to enhance software quality. It can, however, be stiff and less adaptive to changing requirements, similar to the Waterfall approach. The V model is ideal for applications that require extensive testing and verification, such as safety-critical systems.

The phases of the V Model are shown in the following diagram:

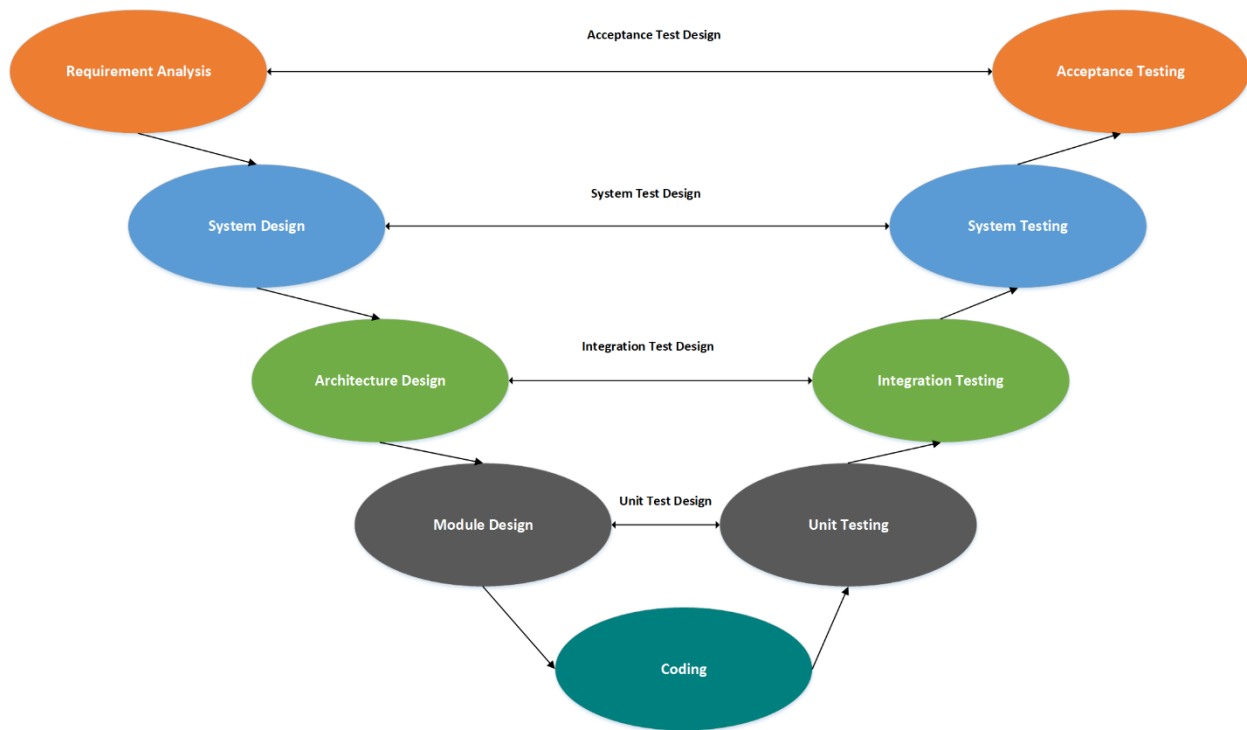


Figure 4. 2: V Model

### Advantages of V Model

- The process flow is unambiguous and well-defined, with each development step having a matching testing phase.
- Early and ongoing testing is encouraged throughout the development lifecycle.
- Traceability between requirements, design elements, and test cases is emphasized.
- The V model's phases generate individual outputs like requirement specifications, design papers, and test plans.

## Disadvantages of V Model

- V model might be restricted when revisions or alterations are necessary during development.
- Reduces the importance of stakeholder input in the development process.
- Most testing operations are completed near the end of the development phase.
- Each phase of development and testing necessitates detailed documentation.

## Dynamic System Development Method (DSDM)

The Dynamic System Development Method (DSDM) is an Agile approach that emphasizes business value delivery and fosters frequent contact between stakeholders and development teams. It emphasizes iterative and incremental development, allowing for adaptation to changing requirements. DSDM encourages active user participation, ongoing communication, and prioritization of critical features. The capacity of DSDM to produce value rapidly and adjust to changing company demands is an advantage. However, it necessitates active user participation, which might be difficult in some applications. DSDM is appropriate for initiatives requiring high business participation and speedy delivery.

The phases of the DSDM Model are shown in the following diagram:

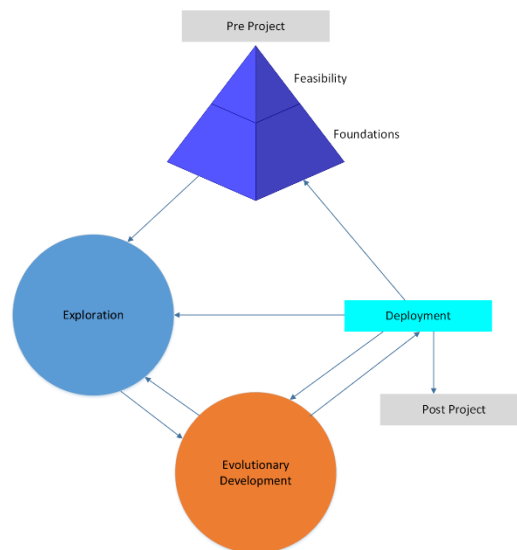


Figure 4. 3: DSDM Model

### **Advantages of DSDM Model**

- Adaptability and flexibility in response to changing requirements.
- The emphasis is on active user participation and cooperation.
- Working software increments are delivered early.
- Constant feedback and consumer interaction.
- The risk was reduced by progressive development and testing.

### **Disadvantages of DSDM Model**

- High reliance on active user participation and availability.
- If needs are not effectively handled, there is a risk of scope creep.
- Suitability for big and sophisticated projects is limited.
- A qualified and experienced development team is required.
- Documentation may be less thorough than using traditional approaches.

## 4.2 Choosing Methodology

Because of the factors above, I have decided to employ the DSDM technique for the Content Management System project. For CMS projects, DSDM will be the best and most appropriate option since the DSDM approach consistently produces high-quality deliverables on schedule. The DSDM approach is highly versatile and may be used in any business or organization. If the client or customer believes it is essential, they may change their requirements throughout the project's development.

## 4.3 Why to Use

The DSDM paradigm encourages adaptation and flexibility in response to changing requirements, which is critical for a CMS project. Stakeholders may seek additional features or alterations as the



project advances. DSDM enables these changes to be addressed efficiently, ensuring that the CMS satisfies changing requirements. Furthermore, the DSDM paradigm encourages effective project management, focusing on providing value within set timelines. DSDM facilitates timely delivery while increasing resource usage by splitting the project into manageable pieces and focusing on the highest priority aspects. Finally, incorporating users, such as content authors and administrators, in a CMS project is critical for understanding their requirements, evaluating functionality, and obtaining feedback. The DSDM paradigm creates a CMS that satisfies user expectations by embracing user views.

#### 4.4 Sections of Methodology

The CMS project's DSDM model is divided into three major methodological sections: the Pre-Project Phase, the Project Lifecycle Phase, and the Post-Project Phase. Each part is critical to the overall success of the CMS project.

##### **Pre-project Phase**

This part lays the groundwork for the CMS project and includes the following activities:

The feasibility study analyses if the project is viable and matches the company's strategic objectives. It entails assessing technical, financial, and operational aspects.

Development of a Business Case: The business case summarises the justification for the CMS project, including its advantages, costs, and risks. It assists stakeholders in making informed decisions and obtaining essential resources.

Project Initiation: The project team is created during project initiation, and essential roles and duties are outlined. The preliminary project plan is developed, and stakeholders' expectations are explained.

##### **Project Lifecycle Phase**

This section covers the CMS project's basic development operations. It is iterative and focused on delivering CMS solution increments. This phase's key activities include:

**Iterative Development:** The CMS system is built in stages, with each iteration giving a helpful increase in functionality. Iterations are time-limited processes that include requirements gathering, design, implementation, testing, and review.

**Prototyping:** Prototyping is a technique for validating requirements, design concepts, and usability. It lets stakeholders view and offer input on the CMS solution early on.

**Solution Deployment:** As the CMS solution's increments are finished, they are deployed into the production environment. This process includes system integration, data migration, user training, and documentation creation.

**Incremental Testing:** Testing is done throughout the project's lifetime to ensure the CMS solution's quality. Functional testing, integration testing, performance testing, and user acceptability testing are all part of it.

### **Post-project Phase**

This section focuses on what happens when the CMS system is launched. It guarantees that the CMS continues to satisfy the demands of users and provides value throughout time. This phase's key activities include:

**User Input and Support:** Collecting input from CMS users is critical for continuous refinement and improvement. User assistance is available to answer any difficulties or concerns and guarantee the seamless running of the system.

**Post-Implementation Review:** The project is thoroughly reviewed to identify lessons learned, best practices, and areas for improvement. This data can be utilized to improve future CMS projects or iterations.

**Continual Improvement:** During the post-project phase, the need for continual improvement is emphasized. It entails making appropriate changes, responding to user demands, and incorporating input into future iterations or additions.

## **4.5 Implementation Plans**

The project's last stage is when the completed application is publicly available. Once an issue with the new system has been identified and resolved, it should be made accessible. The release criteria, settings, and methods are established in this area. If all goes well, the new system will be installed and tested.

## Chapter 5 – Planning

The SECUREX project's planning phase, which comprises establishing the project's goals, deliverables, timetable, resources, and activities, is essential. It serves as the cornerstone for the efficient monitoring, control, and execution of projects. Project planning is crucial in a CMS project for several reasons. First of all, it gives the project a distinct direction and goal. Project planning guarantees that everyone engaged is aware of the project's goals, objectives, and scope and knows why they need to be accomplished. It creates the framework for efficient decision-making and resource management throughout the project [7].

Second, effective resource management depends on project planning. A CMS project needs various resources, including a budget, technology, and human resources. Project planning ensures that the proper people with the required abilities are assigned to the project and that sufficient resources are available to support the project's execution by carefully planning and distributing these resources.

Time management is a crucial component of project planning for a CMS project. A timetable or calendar outlining the tasks, deadlines, and dependencies is part of the project plan. This aids in managing project schedules, establishing reasonable deadlines, and guaranteeing that the project advances on schedule. Effective time management is essential to satisfy client expectations and complete the CMS project by the deadline.

In general, project plans will be covered in this area, covering WBS, time boxing, and a Gantt chart. Some of them are as follows:

### 5.1.1 Management Plan / Work Breakdown Structure (WBS)

The project deliverables and work activities necessary to complete those deliverables are broken down hierarchically into the Work Breakdown Structure (WBS). It allows for better planning, execution, and project control by segmenting the project scope into discrete, manageable chunks. The WBS enables improved resource assessment and allocation by establishing a hierarchical

structure. The project manager may determine the resource requirements for each work package, allowing for efficient resource planning and allocation. In doing so, it is possible to prevent resource overload or underutilization, improving project efficiency. The work breakdown structure (WBS) for the DCL CMS project has been broken down into categories and subcategories as indicated in the chart below:

SL. No.	Task Name	Start date	End date	Duration (in days)
1	Introduction	01/01/2023	01/07/2023	7
2	Initial Study	01/08/2023	01/11/2023	4
3	Literature Review	01/12/2023	01/17/2023	6
4	Methodology	01/18/2023	01/23/2023	6
5	Planning	01/24/2023	01/30/2023	7
6	Feasibility	01/31/2023	02/07/2023	8
7	Foundation	02/08/2023	02/11/2023	4
8	Exploration	02/12/2023	02/25/2023	14
9	Engineering	02/26/2023	04/01/2023	35
10	Deployment	04/02/2023	04/17/2023	16
11	Testing	04/18/2023	04/24/2023	7
12	Implementation	04/25/2023	04/29/2023	5
13	Critical Appraisal and Evaluation	04/30/2023	05/03/2023	4
14	Lessons Learning	05/04/2023	05/07/2023	4
15	Conclusion	05/08/2023	05/08/2023	1
<b>Total</b>				<b>128</b>

Table 5. 1: Work Breakdown Structure of DSMS

### 5.1.2 Resource Allocation

Resource allocation allocates resources to various organizational jobs, activities, and projects. These resources may include people, tools, supplies, and financial assets. Resource allocation in a CMS project entails determining the necessary resources and distributing them effectively to guarantee that the project's goals are realized. This involves figuring out the necessary knowledge and abilities, the availability and capacity of workers, the availability and appropriateness of tools and equipment, and the financial limitations. The following resource allocation for the CMS project is required to meet the planned project delivery schedule:

SL. No.	Task Name	Duration (in days)	Resource
1	Introduction	7	Analyst, User
2	Initial Study	4	Analyst
3	Literature Review	6	Analyst, Team Leader
4	Methodology	6	Analyst, Developer
5	Planning	7	Analyst, Team Leader, Developer, Designer
6	Feasibility	8	Analyst, Team Leader
7	Foundation	4	Analyst, Designer, Developer
8	Exploration	14	Analyst, Designer, Developer
9	Engineering	35	Designer, Developer
10	Deployment	16	Analyst, Developer
11	Testing	7	Designer, Developer, User, Tester
12	Implementation	5	Analyst, Developer, User
13	Critical Appraisal and Evaluation	4	Analyst, Developer, Tester
14	Lessons Learning	4	Analyst, Developer, User
15	Conclusion	1	Analyst

Table 5. 2: Resource Allocation List

### 5.1.3 Time Boxing

A project management strategy known as "time boxing" includes establishing definite, predetermined time intervals, or "boxes," for finishing particular tasks or activities. Each task is given a defined amount of time in time boxing, and the team agrees to do the work within that time limit. The project team benefits from time boxing's ability to instill a feeling of urgency, discipline, and focus.

The agile project management technique employs iterative and incremental development methods, providing the foundation for time boxing.

Time Box	Task Name	Duration (in days)	Resource
TB1	Introduction	7	Analyst, User
	Initial Study	4	Analyst
	Literature Review	6	Analyst, Team Leader
TB2	Methodology	6	Analyst, Developer
	Planning	7	Analyst, Team Leader, Developer, Designer
	Feasibility	8	Analyst, Team Leader
TB3	Foundation	4	Analyst, Designer, Developer
TB4	Exploration	14	Analyst, Designer, Developer
	Engineering	35	Designer, Developer
TB5	Deployment	16	Analyst, Developer
	Testing	7	Designer, Developer, User, Tester
TB6	Implementation	5	Analyst, Developer, User
TB7	Critical Appraisal and Evaluation	4	Analyst, Developer, Tester
	Lessons Learning	4	Analyst, Developer, User
TB8	Conclusion	1	Analyst

Table 5. 3: List of the Time Boxes

#### 5.1.4 Gantt Chart

A Gantt chart is a visual project management tool that shows a project schedule graphically. Project managers and team members may comprehend the progress, dependencies, and milestones since tasks or activities are shown as horizontal bars along a timeline. The Gantt chart makes it possible to track and monitor progress efficiently. The chart may be updated to reflect real progress when tasks are finished, visually depicting the project's current state. Project managers may use this to evaluate progress to the anticipated timetable, spot any deviations, and implement corrective measures to keep the project on track [8]. Here is the Gantt Chart of the CMS Project:

# Gantt Chart

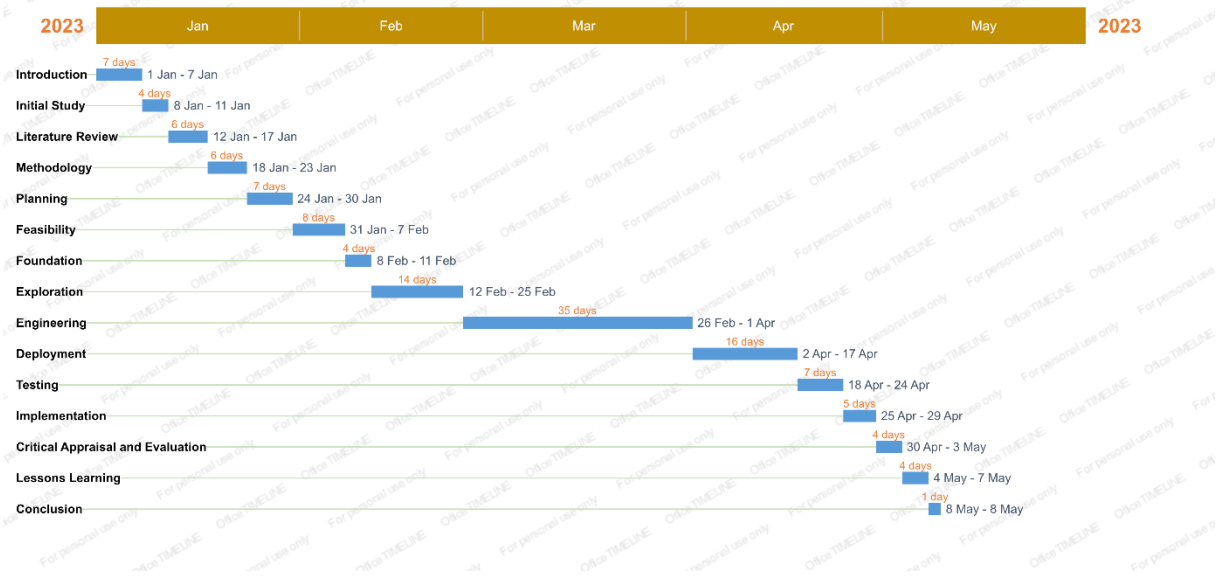


Figure 5. 1: Gantt Chart



## Chapter 6 – Feasibility

Feasibility is the evaluation of a project or idea's viability and practicality. It entails examining various factors, including technical, economic, operational, legal, and scheduling issues, to ascertain if the project can be performed effectively and in line with the organization's objectives and resources. The proposed system's ability to be implemented successfully and produce the expected results is a crucial question in the context of a CMS project. Making informed judgments about the project's beginning and execution is made easier with the help of the feasibility study, which aids in identifying potential risks, obstacles, and restrictions related to the endeavor. Project stakeholders may learn a lot about the possible risks and obstacles involved in the CMS project by completing a thorough feasibility investigation. Organizations can use this analysis as a basis for decision-making to choose whether to move through with the project, change its scope, or look into other options.

### 6.1 All Possible Types of Feasibility

#### 6.1.1 Operational Feasibility

Operational feasibility evaluates a proposed system's or project's ability to successfully implement and integrate into an organization's current operations and procedures. It determines the organization's readiness to accept and maintain the suggested solution. In our CMS projects, an operational feasibility study considers how installing the CMS would affect the organization's regular business operations. It seeks to comprehend how the CMS will integrate with current processes, how users will adjust to the new system, and if the organization has the resources and competencies required to support the CMS properly.

#### 6.1.2 Technical Feasibility

The term "technical feasibility" describes evaluating whether a proposed project or system can be created, implemented, and run utilizing the current technological infrastructure and resources. In

order to assess the project's technical feasibility, it mainly focuses on examining the technical features and restrictions related to it. Technical feasibility study for a CMS project includes determining if the CMS is compatible with the organization's current technological infrastructure and environment. It considers elements like the needed hardware and software, system integration potential, data management, and the accessibility of technical know-how to assist the CMS deployment. Organizations can determine if the proposed CMS fits their technological skills and infrastructure by undertaking a technical feasibility analysis.

The following list of technological elements applies to this CMS project:

<b>Hardware</b>	<b>Software</b>	<b>Database</b>
Wi-Fi Router, Asus Laptop	Xampp, MS Word, Google Sheets, Google Chrome Browser, Mozilla Firefox, Windows 10 OS	MySQL

## **Technology**

<b>Client Side</b>	<b>Server Side</b>
HTML, CSS, Bootstrap, JavaScript, Ajax, jQuery	PHP

Table 6. 1: Technical Feasibility

### 6.1.3 Economic Feasibility

Economic feasibility is the assessment of a proposed project's or system's financial viability and cost-effectiveness. It entails determining if the project's advantages offset the expenses spent. An economic feasibility study is a tool used to assess a CMS project's potential financial viability and ability to provide a good return on investment (ROI). Organizations can determine if investing in a CMS is financially feasible and worthwhile by completing an economic feasibility analysis. It

assists in coordinating the project with the organization's strategic objectives and available funding, ensuring that the CMS's advantages outweigh its costs.

### **Cost of a Web-based Application**

Instead of directly from the device's memory, a web-based application can be accessed over an HTTP network connection. The most common tool for running web-based software is a web browser. A tiny portion of the software is installed onto the user's computer in a web-based, client-based application, while an external server does most of the work.

<b>Equipment</b>	<b>Cost Per Unit</b>	<b>Cost</b>
Internet	2,000(Per month)	2,000
Asus Laptop (core i7, 1.60 GHz up to 3.40 GHz, 8GB DDR4 RAM, HDD, SSD)	1,20,000	1,20,000
Domain, Hosting, and email service	13,500(Per month)	13,500
Total	1,35,500	1,35,500

Table 6. 2: Cost of a Web-based Application

### **Cost of a Desktop Application**

One may use a desktop application to perform specific tasks on their computer. Multi-purpose desktop programs include a word processor and a music player, whereas gaming apps are only there for pleasure.

<b>Equipment</b>	<b>Cost Per Unit</b>	<b>Cost</b>
Asus Laptop (core i7, 1.60 GHz up to 3.40 GHz, 8GB DDR4 RAM, HDD, SSD)	1,20,000	1,20,000
Domain, Hosting, and email service	13,500(Per month)	13,500
<b>Total</b>	<b>1,33,500</b>	<b>1,33,500</b>

Table 6. 3: Cost of a Desktop Application

### 6.2 Cost-Benefit Analysis

By contrasting the expenses associated with a project or investment with the predicted benefits it will provide, cost-benefit analysis is a methodical strategy used to determine if it is financially feasible to proceed. By comparing the costs and advantages in monetary terms to evaluate if the project is financially viable, it offers a formal framework for decision-making. A cost-benefit analysis is carried out to determine if the project's advantages outweigh the expenditures. The study considers both material and immaterial elements that are measurable in monetary terms. Direct financial expenses and savings are tangible costs and benefits, whereas better productivity, increased customer happiness, or environmental effect are examples of intangible costs and benefits [9].

The following table shows the projected revenue and expenses for the next five years:

**Cost in Total**

<b>SL. No.</b>	<b>Equipment Cost</b>	<b>1<sup>st</sup> Year</b>	<b>2<sup>nd</sup> Year</b>	<b>3<sup>rd</sup> Year</b>	<b>4<sup>th</sup> Year</b>	<b>5<sup>th</sup> Year</b>	<b>Cost in total</b>
1	<b>Web-based Application</b>	₹1,17,000					₹1,17,000

2	<b>Email, Domain &amp; Hosting</b>	₹18,000	₹18,000	₹18,000	₹18,000	₹18,000	₹90,000
3	<b>Desktop-based Application</b>	₹1,25,000					₹1,25,000
4	<b>Maintenance</b>	₹50,000	₹50,000	₹50,000	₹50,000	₹50,000	₹1,50,000
5	<b>Staff Expenses</b>	₹30,000	₹30,000	₹30,000	₹30,000	₹30,000	₹1,40,000
<b>Total</b>		<b>₹3,40,000</b>	<b>₹98,000</b>	<b>₹98,000</b>	<b>₹98,000</b>	<b>₹98,000</b>	<b>₹8,32,000</b>

Table 6. 4: Total Cost Estimation for the Project

### Earnings in Total

SL. No.	Sector of earning	1 <sup>st</sup> Year	2 <sup>nd</sup> Year	3 <sup>rd</sup> Year	4 <sup>th</sup> Year	5 <sup>th</sup> Year	Earning in total
1	Software Selling	₹2,20,000	₹2,90,000	₹3,60,000	₹4,30,000	₹5,00,000	₹18,05,000
	<b>Total</b>	<b>₹2,20,000</b>	<b>₹2,90,000</b>	<b>₹3,60,000</b>	<b>₹4,30,000</b>	<b>₹5,00,000</b>	<b>₹18,05,000</b>

Table 6. 5: Earning estimation for the project

## Revenue in Total

SL. No.	Revenue Sector	1 <sup>st</sup> Year	2 <sup>nd</sup> Year	3 <sup>rd</sup> Year	4 <sup>th</sup> Year	5 <sup>th</sup> Year	Revenue in total
1	Earning	₹2,20,000	₹2,90,000	₹3,60,000	₹4,30,000	₹5,00,000	₹18,05,000
2	Cost	₹4,42,000	₹95,000	₹95,000	₹95,000	₹95,000	₹9,34,000
	<b>Total Revenue</b>	<b>- ₹2,22,000</b>	<b>₹1,95,000</b>	<b>₹2,65,000</b>	<b>₹3,35,000</b>	<b>₹4,05,000</b>	<b>₹8,71,000</b>

Table 6. 6: Estimated Revenue on a Five-year Scale

## Market Research Based on CRM Software

The CMS (Content Management System) market is a vibrant, competitive sector that assists organizations in efficiently managing and delivering digital content. In recent years, the CMS market has expanded significantly. During the projected 2021–2028, the worldwide CMS market is anticipated to expand at a CAGR of 16.2%, according to research by Market Research Future [10]. The adoption of digital content strategies, the expansion of mobile and e-commerce platforms, and the demand for effective content management across sectors influence this growth. Several options are available on the CMS market to meet different corporate requirements. Businesses have a wide range of options to choose from depending on their needs and budget, ranging from open-source platforms like WordPress, Drupal, and Joomla, which offer flexibility and customization options, to enterprise-grade CMS options like Adobe Experience Manager and Sitecore, which offer robust features and scalability. One of the most important requirements for companies running online stores is the integration of CMS with e-commerce platforms. Content management systems (CMS) that provide seamless integration with well-known e-commerce platforms like Magento, Shopify, and WooCommerce make it possible to manage product catalogs, process orders more quickly, and manage content effectively.

### 6.3 Is DSDM Good or Bad for this Project

Based on several factors, the Dynamic System Development Method (DSDM) is an appropriate strategy for the SECUREX project. The rapid and iterative development methodology used by DSDM enables regular stakeholder participation and input. This can be helpful in the context of a CMS project since it allows for ongoing improvement and flexibility to changing requirements. Because DSDM is iterative, critical capabilities may be delivered early, allowing the CMS system to gradually improve and change in response to user input. This is essential for SECUREX since it guarantees that the system will satisfy the unique requirements and preferences of content producers, editors, and administrators. A user-friendly, intuitive CMS solution that aligns with the organization's content management needs is produced with the active participation of end users thanks to DSDM. The DSDM methodology concentrates on producing functional software in fewer iterations, which helps reduce the time to market for the project. This might be helpful for firms who need to quickly implement the CMS system to begin managing their digital material well. The DSDM's gradual and iterative methodology enables early delivery of essential features, allowing enterprises to enjoy the advantages of the CMS system sooner. Therefore, DSDM's agile and user-centric approach, flexibility, and emphasis on early delivery might make it a strong fit for the SECUREX. However, the project team and stakeholders should carefully assess the organization's readiness for implementing an agile methodology, the learning curve, documentation needs, and resource availability.

## Chapter 7 – Foundation

### 7.1 The Problem Area Identification

The Problem Area Identification section aims to identify and describe the difficulties and pain points the CMS project faces. It offers a thorough awareness of the areas that require development and acts as a starting point for developing workable solutions. This part examines the many CMS project components that provide challenges and reduce the process's overall efficacy. The CMS project may concentrate on creating efficient solutions to each obstacle by carefully identifying and comprehending these problem areas. To guarantee that the CMS project produces an improved content management system that gets around these challenges, use this section as a reference for future conversations, planning, and decision-making.

There are several ways to find the issue. The following solution is made using two of them:

#### 7.1.1 Interview

The CMS project's Problem Area Identification phase uses the interview approach as a crucial strategy. Interviews entail having one-on-one or group conversations with the relevant parties, such as content producers, editors, administrators, and end users. With insightful observations, fresh viewpoints, and firsthand accounts, this approach tries to pinpoint and comprehend the difficulties and pain areas of the present CMS system. Participants can share their ideas, complaints, and suggestions about the CMS through open-ended interview questions. These talks offer the chance to go further into particular difficulties, find undiscovered concerns, and develop a thorough grasp of the requirements and expectations of the users.

#### 7.1.2 Observation

Utilizing direct observation of users, their actions, and the environment in which they interact with the system or carry out activities, observation is a research technique used during the issue area



identification phase to obtain data and insights. It entails closely observing and documenting people's or groups' behaviors, relationships, and patterns in authentic settings. Observing researchers can get important firsthand information about user preferences, issues, and behaviors. Rich and contextual data may be collected with this strategy, which may not be possible with only interviews or questionnaires. Observations can bring to light unmet or unstated demands, point out usability problems, and give a greater understanding of the user experience.

### 7.1.3 Questionnaires

The CMS project's Problem Area Identification phase uses the questionnaire method well. It entails creating a systematic collection of questions for a specific stakeholder group. The questionnaire aims to collect quantitative and qualitative data about respondents' experiences, viewpoints, and difficulties with the present CMS system. Questionnaires are a scalable and effective way to get data from many individuals. Depending on the accessibility and preferences of the interested parties, they may be provided online or in paper form. The survey's questions can be closed-ended (with predetermined response possibilities) or open-ended (enabling participants to give in-depth, personalized responses).

**Note:** The user and the DCL analyst finished this section on issue area identification. I have known this method since I completed an internship with DCL (Daffodil Computers Limited).

## 7.2 Rich Picture



Figure 7. 1: Rich Picture of CMS

### 7.3 Specific problem area identification and description

Identifying requirements for this CMS is challenging, considering the size of the endeavor. On the other hand, the client is not knowledgeable about needs. For better development, we must determine user needs.

### 7.4 Possible Solution

We must employ a method to determine the user requirements for this system, such as an observation, a questionnaire, or an interview. On the other hand, we may separate this user need into two parts: functional and non-functional.

## 7.5 Overall Requirement List

The list of requirements is mainly split into two sections:

- i. Functional Requirements
- ii. Non-functional Requirements

### 7.2.1 Functional Requirements

To achieve its intended purpose and cater to the demands of its users, a software system or application must possess the specified features, capabilities, and behaviors known as functional requirements. These specifications explain the actions the system should take in response to user inputs or system events, and they describe the functions or tasks the system should be able to execute. The system's design, development, and testing are built upon these needs. They give stakeholders a distinct and concrete foundation to assess the system's performance and ensure it meets their demands and expectations.

- Content creation and editing capabilities
- Content publishing and version control
- Content organization and categorization features
- User management and permission settings
- Workflow management and collaboration tools
- Robust search functionality
- Customizable content presentation and templating options
- Integration with other systems and third-party applications
- Analytics and reporting features
- Responsive Design
- Security and access control measures

### 7.2.2 Non-Functional Requirements

Instead of specifying particular capabilities, non-functional requirements establish the quality characteristics or limitations determining how a system should act or operate. These specifications emphasize the system's general qualities, such as performance, reliability, security, usability, maintainability, and scalability. They are necessary to ensure the system satisfies its users' and stakeholders' requirements and expectations. Response time, system availability, data integrity, user interface design, system performance under different loads, system security measures, compliance with industry standards and regulations, ease of system maintenance and upgrades, and user experience are just a few examples of non-functional requirements.

- Responsiveness of the user interface.
- Uptime and system availability.
- Capability for data backup and recovery.
- Adherence to security guidelines and regulations.
- Scalability to deal with user and content traffic.
- Integration with other programs and systems.
- Administration and user management are made simple.
- Compatibility with many devices and online browsers.
- Efficient version control and content publishing.
- Efficient data retrieval and storage.
- Flexibility and adaptability for specific company needs.
- Resources for users and administrators in terms of documentation and assistance.

## 7.6 Technology to Be Implemented

For a Content Management System (CMS) to be successfully developed and run, it is essential to implement the right technologies. SECUREX may give a quick and responsive performance with the support of effective and optimized technology, resulting in a seamless user experience. Technologies like server-side rendering and caching systems improve the speed of content distribution. Using scalable technology, the CMS can manage heavier workloads and accept more traffic as the system expands. SECUREX may scale well thanks to scalable technologies like cloud-based solutions or horizontal scaling systems. Based on the particular needs and objectives

of the CMS project, it is crucial to undertake an in-depth study and evaluation of the technologies. The practical implementation will depend on considering elements like performance, scalability, security, adaptability, integration capabilities, and community support.

- PHP and Laravel are open sources, so if something breaks, we can fix it immediately without waiting for an update or shelling out money for it.
- PHP is extensible.
- There are the most supported databases.
- The majority of platforms are compatible with PHP. It is platform agnostic for this.
- PHP delivers excellent performance and dependability and is compatible with most servers, including IIS and APACHE. It also has inexpensive development and maintenance expenses.

### **Client-server application**

- The client-server architecture divides the system into client-side and server-side components and is a typical methodology used in CMS development.
- The server-side application logic, data storage, user authentication, and access control may all be built using tools like Java,.NET, or Python.
- Technologies like HTML, CSS, and JavaScript may be used to build a user interface that is simple to use and interactive on the client side, enabling users to engage with the CMS and manage information efficiently.
- To efficiently store and retrieve data, database management systems like MySQL, PostgreSQL, or MongoDB can be employed.
- Implementing APIs (Application Programming Interfaces) will make communication easier for the client and server components, allowing for data interchange and interaction with other external systems or services.

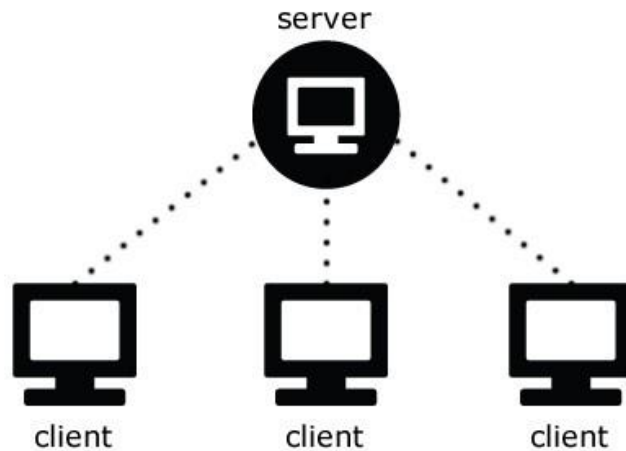


Figure 7. 2: Client-Server Application

### Web-based application

- The structure and styling of web pages are created using HTML and CSS, resulting in an aesthetically pleasing and user-friendly interface.
- Frameworks for JavaScript like React, Angular, or Vue. When used to create dynamic and interactive web interfaces, js can include elements like responsive design, drag-and-drop capability, and real-time updates.
- Programming languages used on the server, like Node.js, Python, and PHP.Js, may be used to create dynamic web pages, manage server-side logic, and handle user requests.
- Databases like MySQL, MongoDB, or SQLite may be used to store and retrieve content, making it possible to manage and retrieve massive amounts of data effectively.
- The CMS application may be hosted on web servers like Apache or Nginx, which can also manage HTTP requests.



Figure 7. 3: Web-based Application

## 7.7 Recommendations and Justifications

I considered security, usability, comfort, and efficiency when creating my school administration system. Therefore, choosing a strategy is essential. To create a great, clear, and user-friendly project design, I utilized HTML, CSS5, bootstrap, and JavaScript. I created the website to be user-friendly and responsive. I ran the backend using the PHP-based Laravel Framework and MySQL to manage the database. PHP is a very rapid and secure method of managing backend data.

Furthermore, working with MySQL is relatively safe. The PHP Laravel framework allows me to handle data, whatever I like. It becomes highly secure and speedy since enormous libraries do not need to be loaded frequently.

## Chapter 8 – Exploration

### 8.1 Old System Use Case



Figure 8. 1: Old System Use Case



## 8.2 Activity Diagram

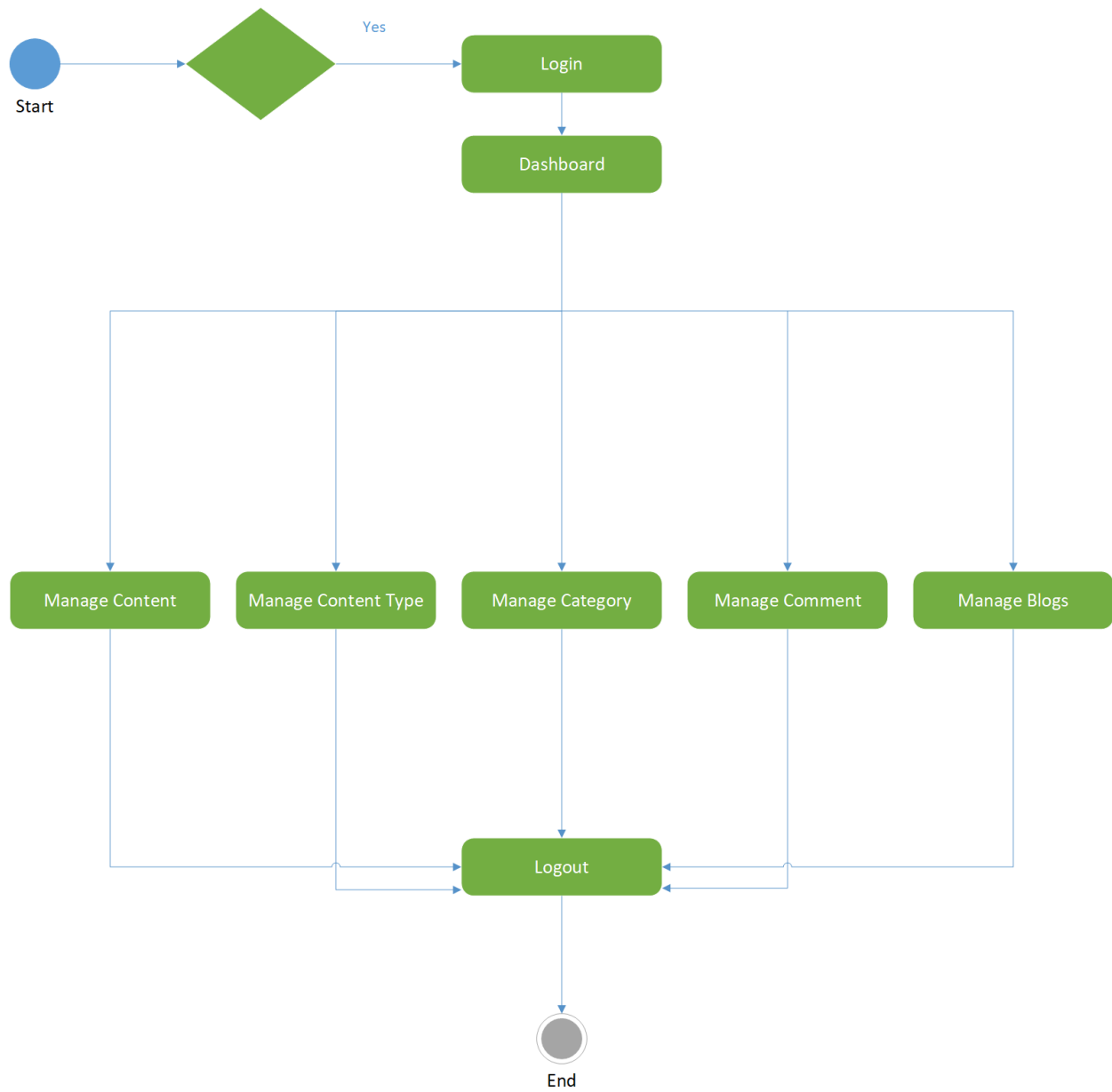


Figure 8. 2: Activity Diagram

### 8.3 Full System Use Case Diagram

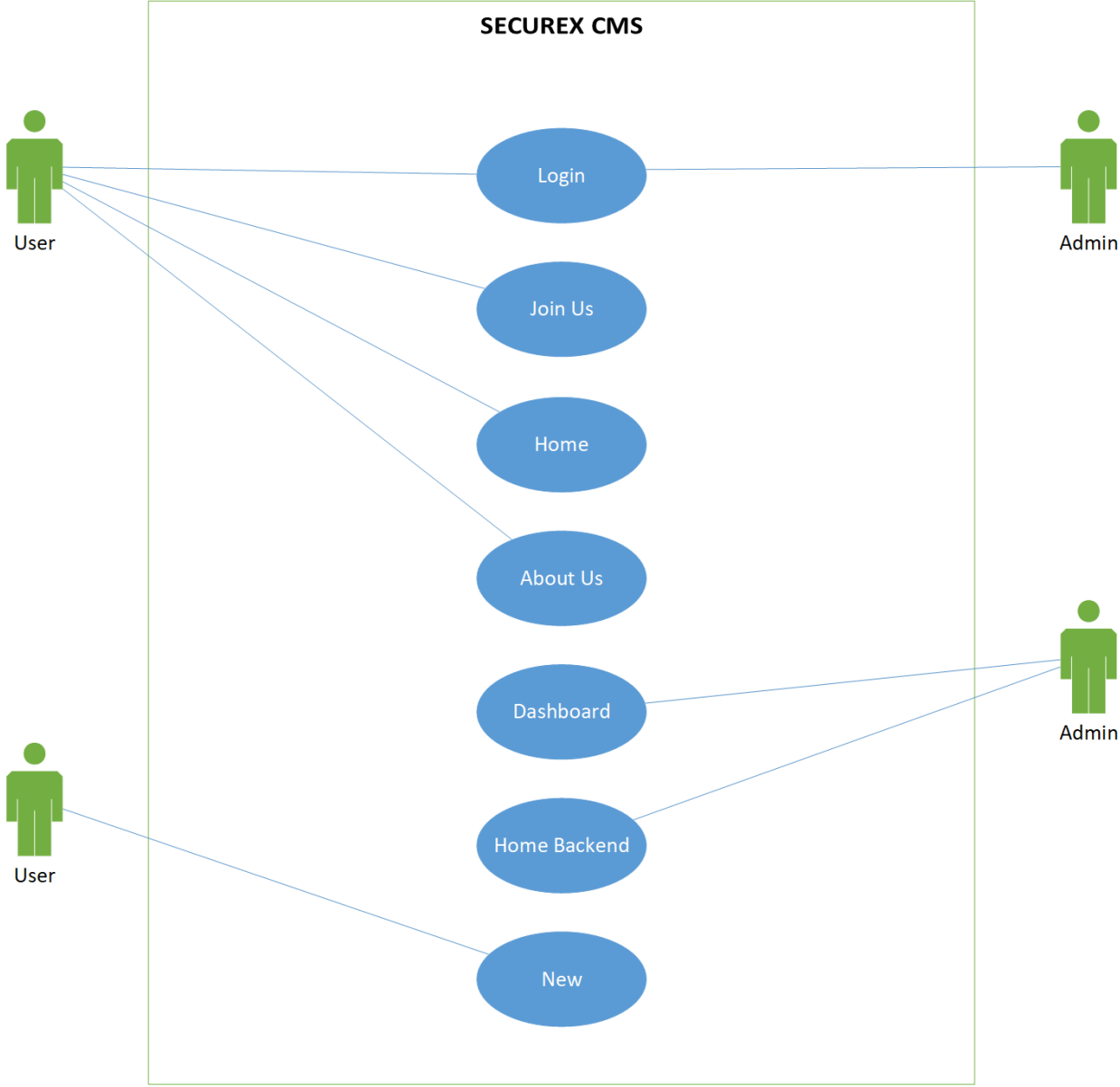


Figure 8. 3: Full System Use Case

8.3.1 Breakdown of Use Case diagram according to the functions of Securex CMS

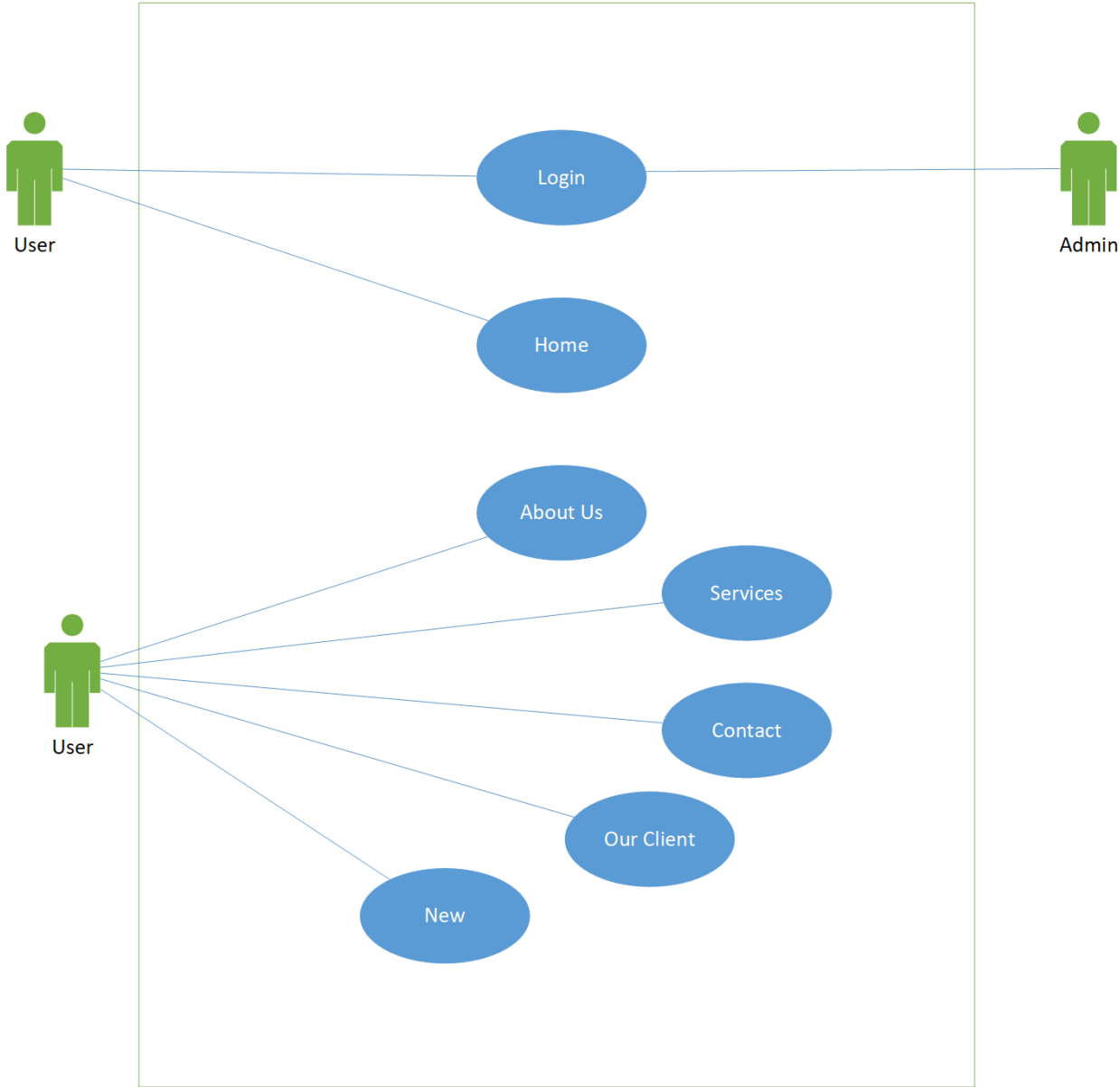


Figure 8. 4: Use Case of Homepage

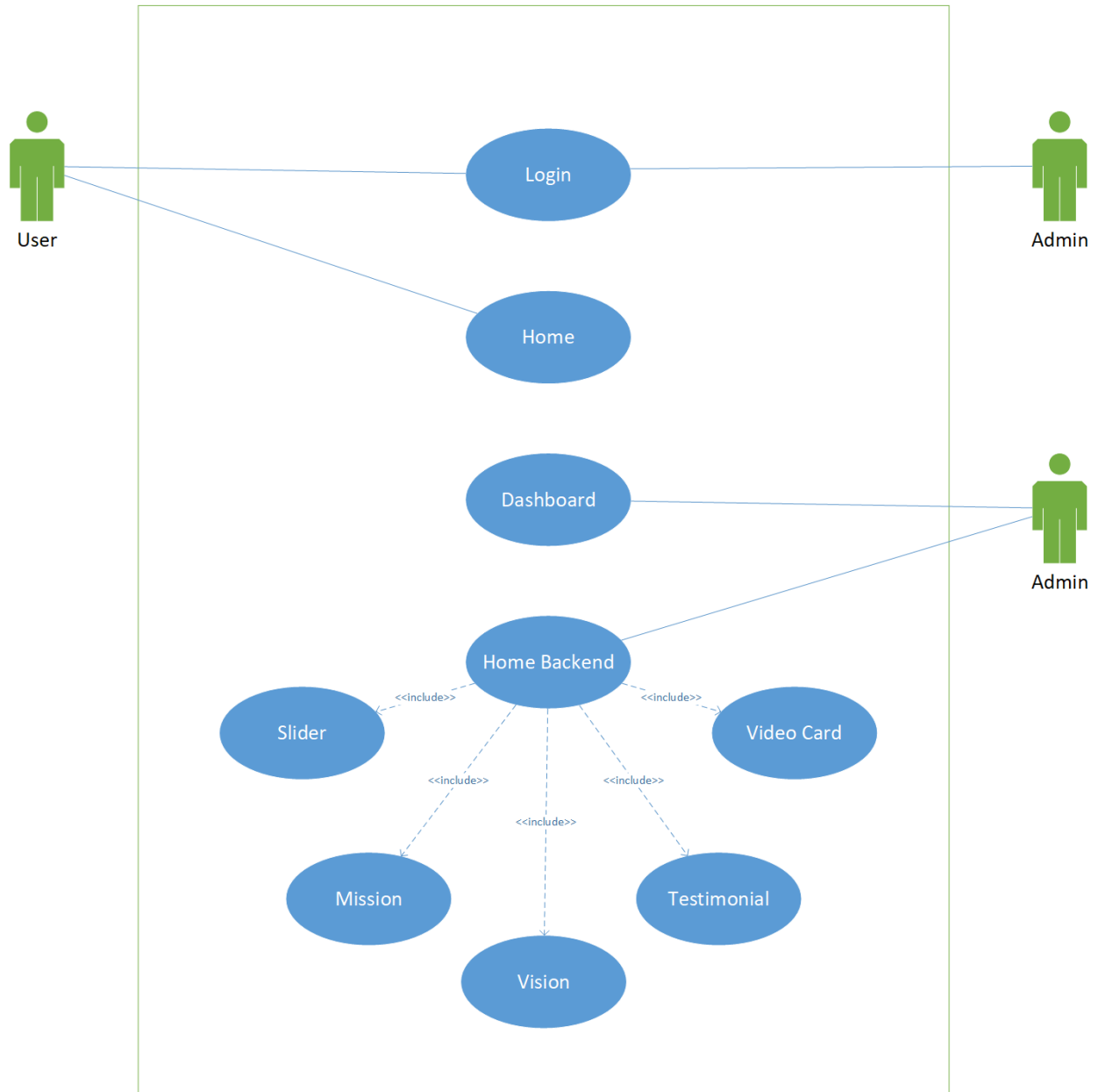


Figure 8. 5: Use Case of Dashboard

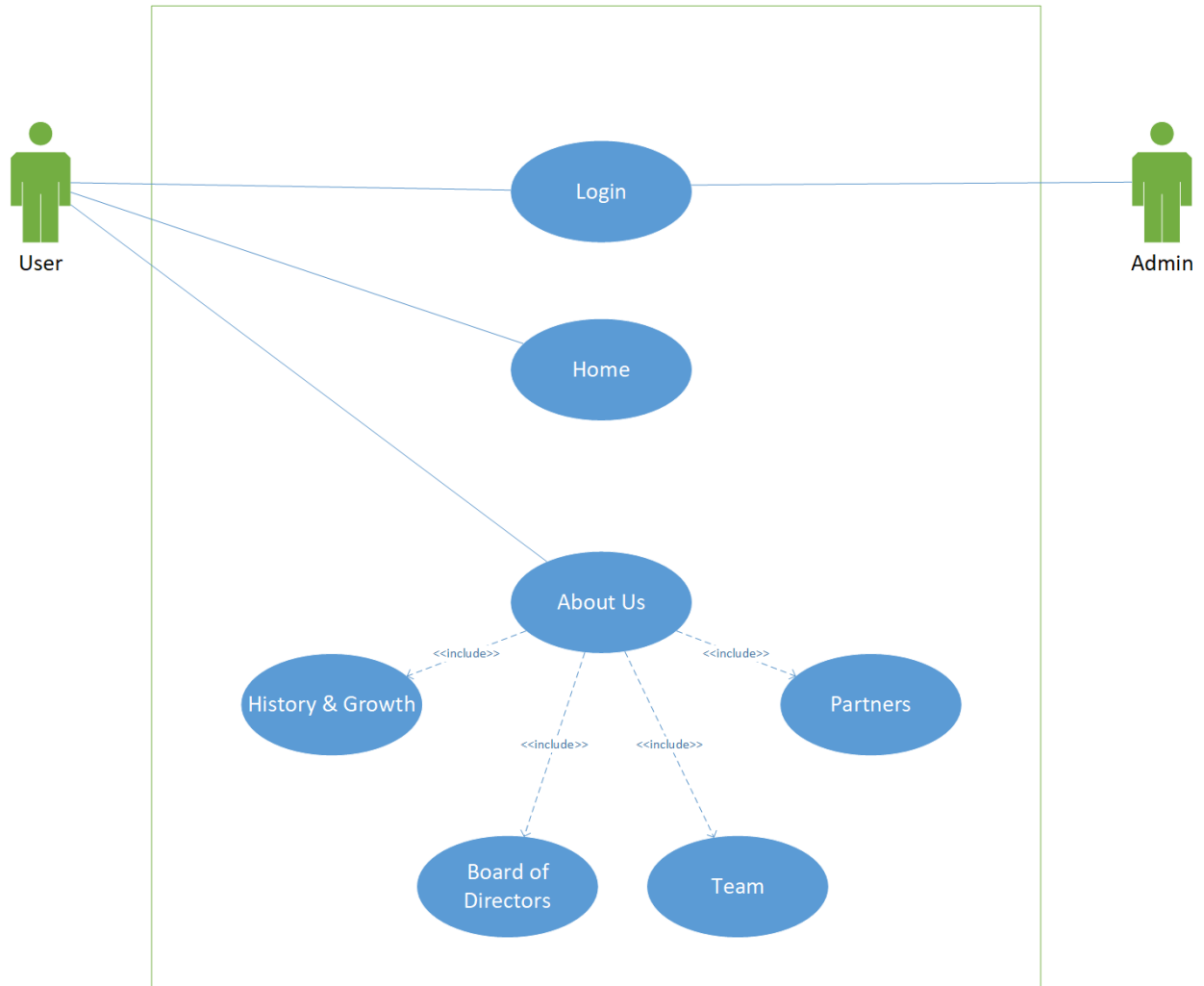


Figure 8. 6: Use Case of About Us

## 8.4 Full System Activity Diagram

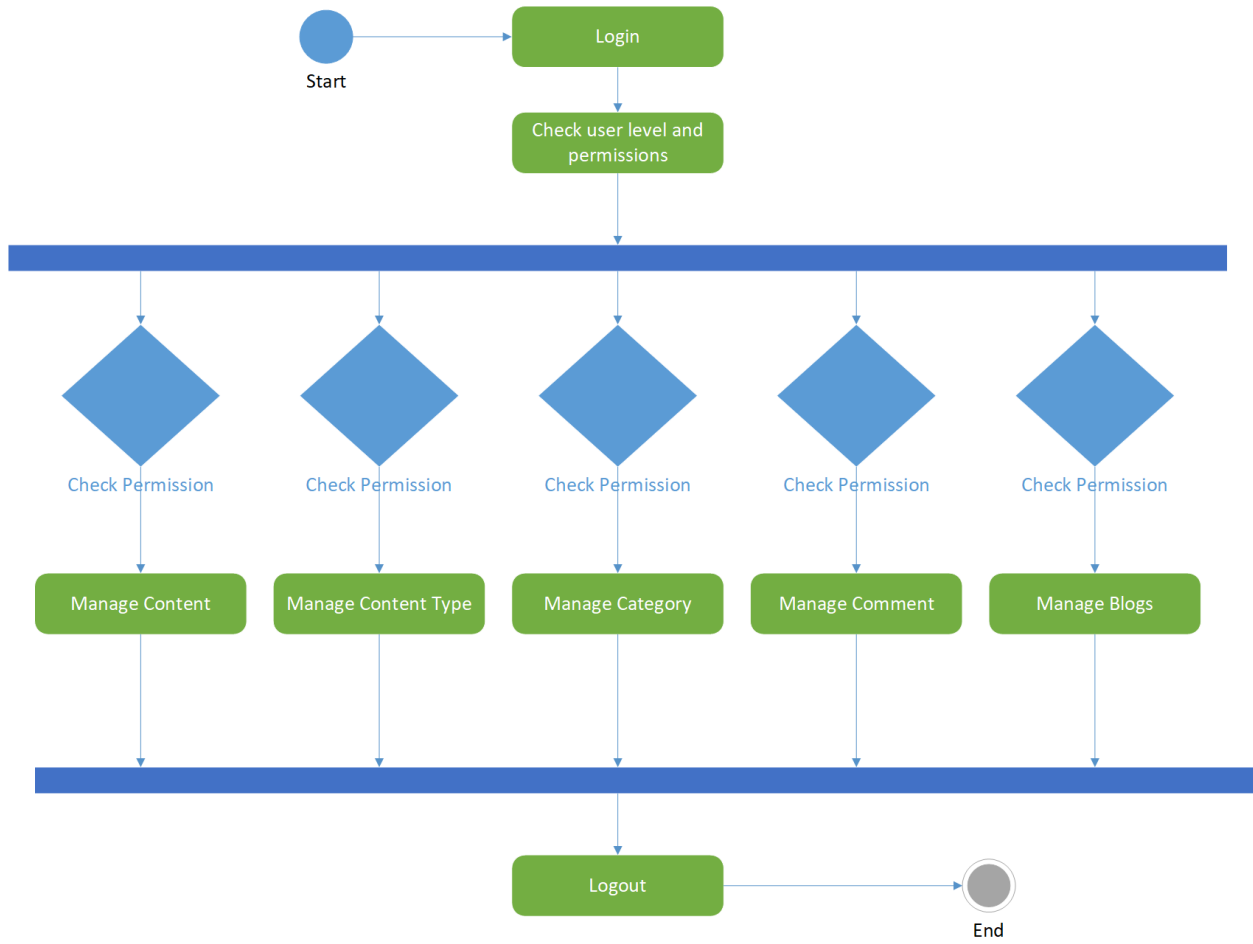


Figure 8. 7: Full System Activity Diagram

## 8.4 Requirements Catalogue

A software system or project's functional and non-functional needs are described in a requirement catalog, sometimes called a requirements specification or requirements document. It gives an explicit knowledge of the objectives to be met and acts as a reference for all parties participating in the development process.

### Requirement catalog for the login system

<b>Requirement Type</b>	Functional Requirement		
<b>Requirement Name</b>	Login and registration system for the admin		
<b>Requirement Description</b>	The person who will be the admin of this system should be registered at the time of the software installation. When the admin is registered, no one can access the system except the admin with proper authentication.		
<b>Requirement ID</b>	<b>Date Source</b>	<b>Priority</b>	<b>Sign off</b>
<b>M-01</b>	Admin	Must	Admin
<b>Requirement Type</b>	Non-Functional Requirement		
<b>Requirement Name</b>	The attempt to log in per day		
<b>Description</b>	<b>Target Value</b>	<b>Acceptance Value</b>	<b>Comment</b>
	1500	1000	Only the admin can log in.

Table 8. 1: Requirement catalog for the login system

## Requirement catalog for creating Homepage and Dashboard

<b>Requirement Type</b>	Functional Requirement		
<b>Requirement Name</b>	Admin will create companies and contacts info.		
<b>Requirement Description</b>	The homepage and dashboard contain many functionalities, including leads, accounts, partners, vendors, competition, and contacts. Admin must have the opportunity to create them.		
<b>Requirement ID</b>	<b>Date Source</b>	<b>Priority</b>	<b>Sign off</b>
M-02	Admin	Must	Admin
<b>Requirement Type</b>	Non-Functional Requirement		
<b>Requirement Name</b>	Companies and contacts added per day		
<b>Description</b>	<b>Target Value</b>	<b>Acceptance Value</b>	<b>Comment</b>
	1000	800	Admin can add them

Table 8. 2: Requirement catalog for creating homepage and dashboard

### 8.5 Requirement Prioritized

In order to help the development team allocate resources and efforts effectively, requirement prioritizing is the process of evaluating the relative relevance and urgency of needs. By prioritizing needs, stakeholders may make well-informed choices about which features or functions to include in the initial release and which can be postponed for later iterations or releases. Requirements are divided into four priority categories by the MoSCoW Method: Must-Have, Should-Have, Could-Have, and Won't-Have. It aids in clearly separating the essential needs from the attractive but non-essential requirements.



Requirement category	Requirement Name
Must have	<ol style="list-style-type: none"> <li>1. User authentication and access control.</li> <li>2. Content creation and editing.</li> <li>3. Content storage and retrieval.</li> <li>4. Version control.</li> <li>5. Search functionality.</li> </ol>
Should have	<ol style="list-style-type: none"> <li>1. Responsive design.</li> <li>2. Content categorization and tagging.</li> <li>3. Media management.</li> <li>4. SEO optimization.</li> </ol>
Could have	<ol style="list-style-type: none"> <li>1. Multilingual support.</li> <li>2. Workflow and approval process.</li> <li>3. Analytics and reporting.</li> </ol>
Won't have	<ol style="list-style-type: none"> <li>1. Social media integration</li> </ol>

Table 8. 3: Requirement Prioritized

### 8.6 Prototype of Securex Content Management System

## Welcome back

Enter your email and password to sign in

Email

atikrana70@gmail.com

Password

.....



Remember me

SIGN IN

Copyright © 2023 SECUREX.

Figure 8. 8: Login System Prototype

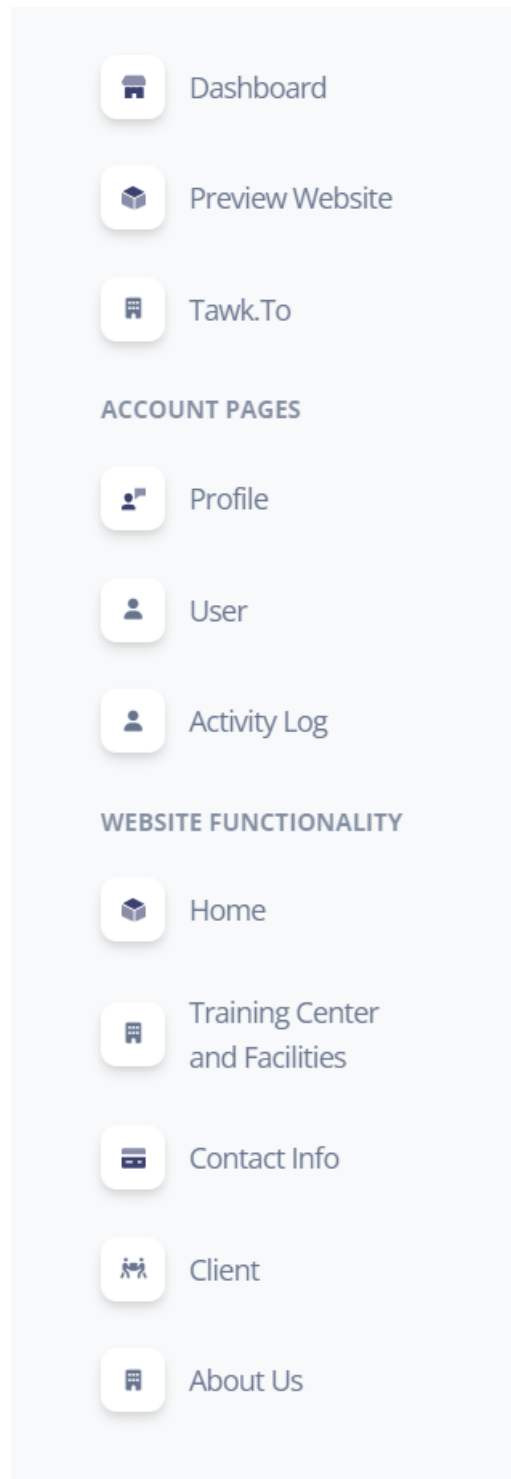


Figure 8. 9: Navigation Panel Prototype

Pages / Mission Vision & Values MD ATIKUR RAHMAN Log Out

### Mission Vision & Values

## Update Mission Vision & Values

**Mission**

To synergize the integration of human resources with automation to create efficient security solutions for the community.

**Vision**

Changing the concept of security for a safer society.

**Values**

Teamwork, Integrity, Ownership, Commitment, and Trued.

**SUBMIT**

Figure 8. 10: Mission Vision & Values Page Prototype

**Client** **ADD CLIENT**

Client Name	Client Link	Client Image	Action	Last Edited Time	Last Editor
			<b>EDIT</b> <b>DELETE</b>	2022-09-01 01:15 pm (9 months ago)	
			<b>EDIT</b> <b>DELETE</b>	2022-09-01 01:14 pm (9 months ago)	
			<b>EDIT</b> <b>DELETE</b>	2022-09-01 01:14 pm (9 months ago)	
			<b>EDIT</b> <b>DELETE</b>	2022-09-01 01:14 pm (9 months ago)	

< 1 2 3 4 5 6 > ⚙️

Figure 8. 11: Client Page Prototype

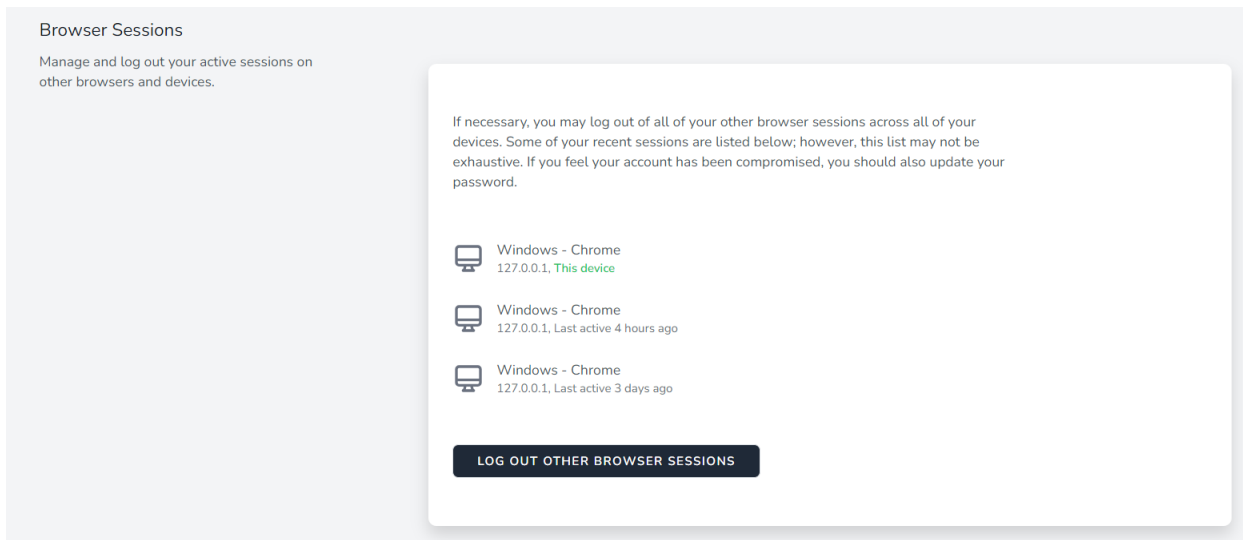


Figure 8. 12: Browser Session Prototype

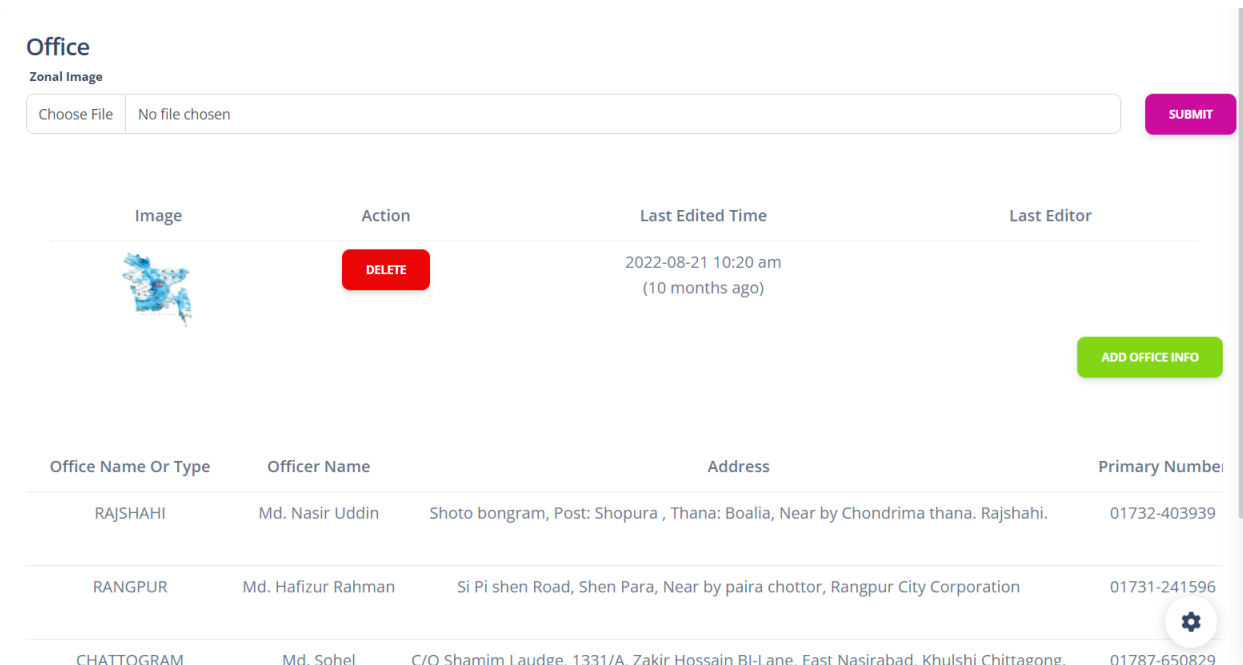


Figure 8. 13: Office Page Prototype

## Chapter 9 – Engineering

### 9.1 Modules of the new system

A Content Management System's (CMS) modules might change depending on the particular needs and functionality of the system. However, the following are some typical modules that can be found in SECUREX:

**User Management:** This module is in charge of managing user profiles, registration, and authentication. The creation and management of user roles, permissions, and access levels are possible for administrators.

Users may create, update, and manage material inside the CMS using this module's content creation and management features. It offers a user-friendly interface with features including a WYSIWYG editor, media integration, and article formatting choices.

**Storage and retrieval of Content:** The topic of this module is the storage and retrieval of content pieces. It has a database or file system for storing material and search capabilities to find specific content pieces quickly.

The main topic of this module is handling media files, including pictures, videos, and documents. Users may upload, arrange, and include media in content pages.

**Workflow and publication:** This module manages the content publication process. It has capabilities like content scheduling, version control, and workflow management to simplify collaboration and approval procedures.

**Site Organization and Navigation:** This module discusses how the website is structured and navigated. It offers tools for setting up and managing URL structures, navigation hierarchies, and site menus.

**Analytics and Reporting:** This module interfaces with analytics tools to collect and analyze information about how well a website performs, how users behave, and how engaging its content is. It offers analysis and reports to boost the efficiency of the website.

Security and Access Control: This module's primary goal is the CMS system's security. It has attributes including SSL support, role-based access control, and defense against widespread online vulnerabilities.

Extension and customization: This module enables the CMS system's extension and customization. It offers a framework or interface for programmers to build modules, plugins, or customizations to improve the system's functioning.

### 9.2 Use Case

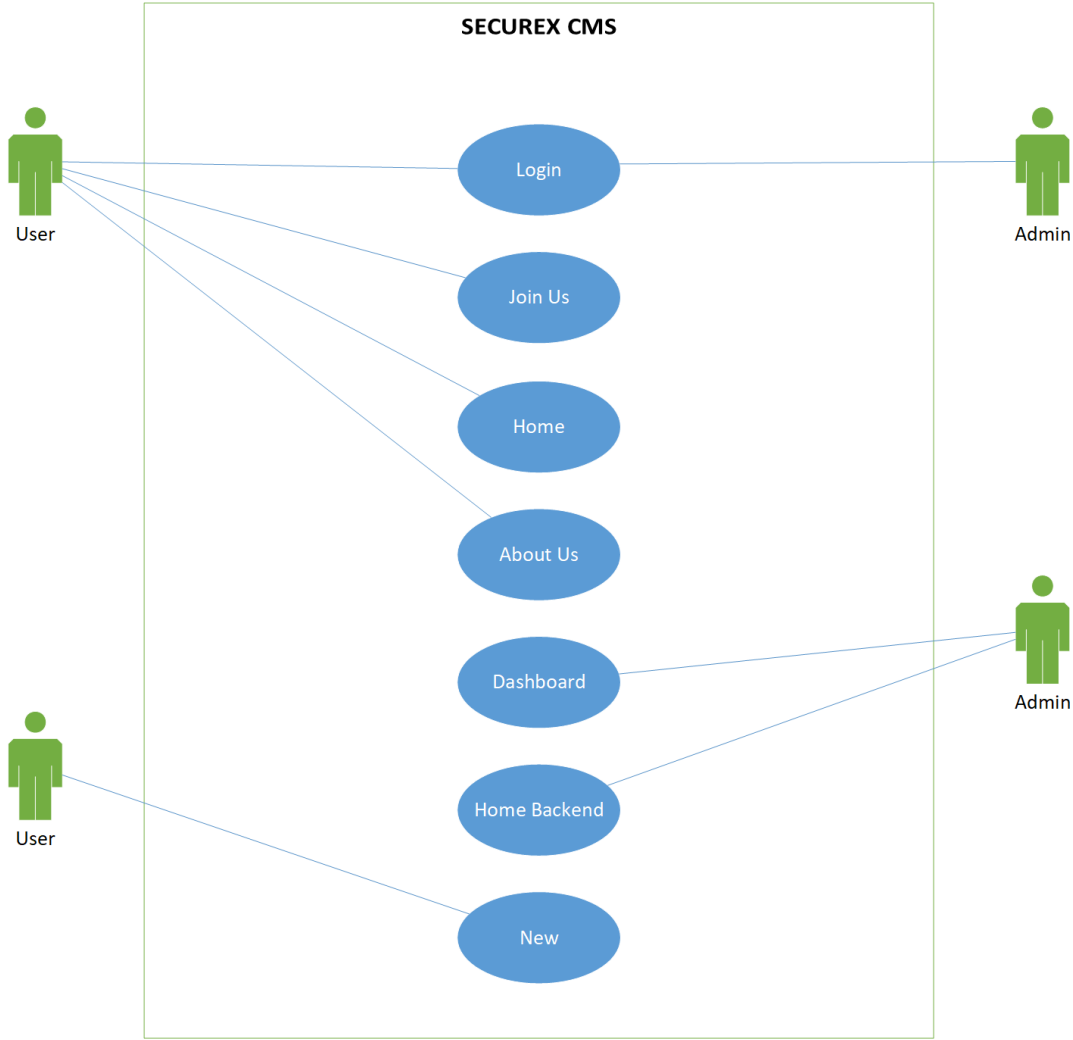


Figure 9. 1: Use Case Diagram

### 9.3 Peter Chen EERD Diagram

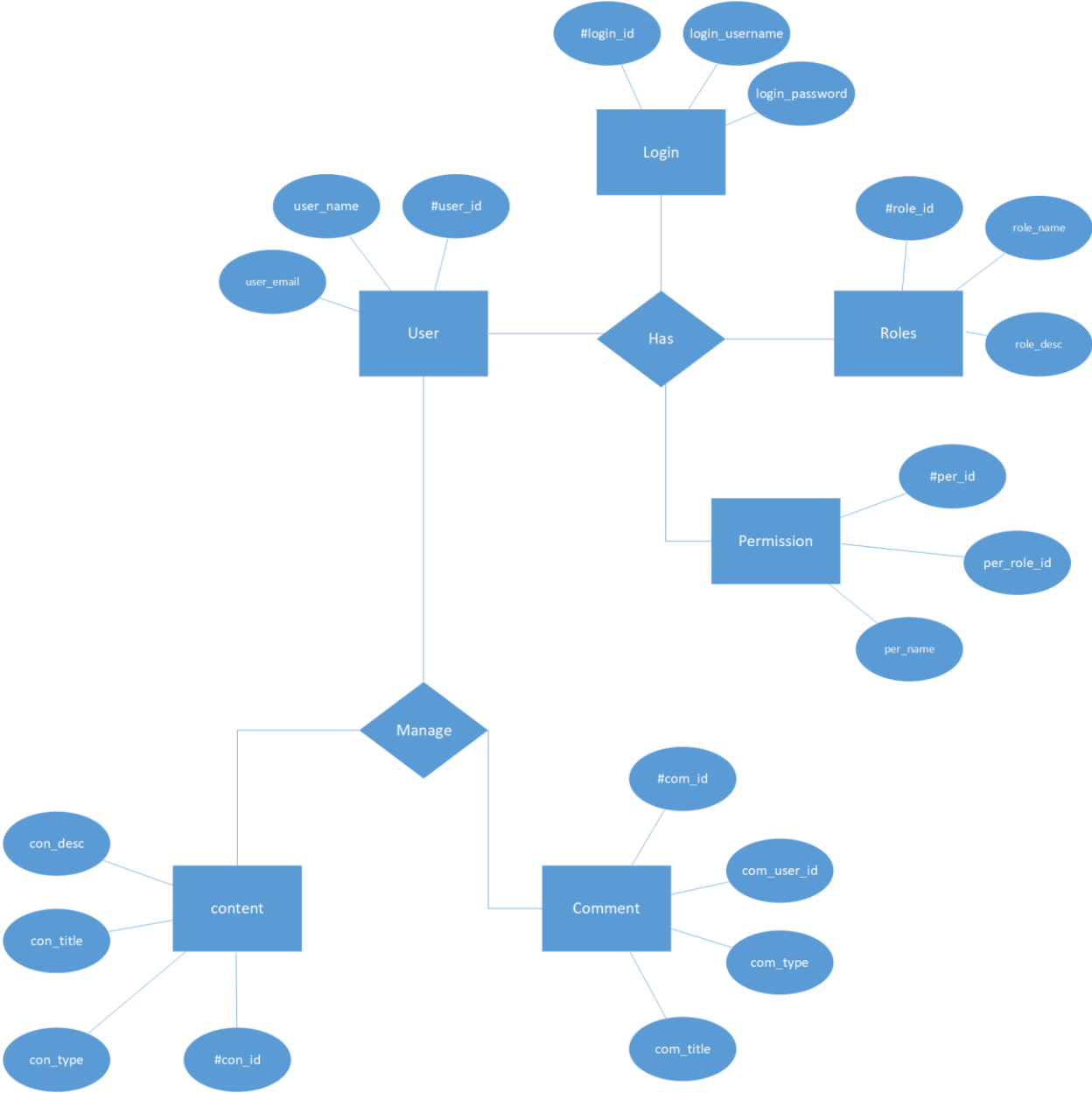


Figure 9. 2: Peter Chen EERD Diagram



## 9.4 Class Diagram

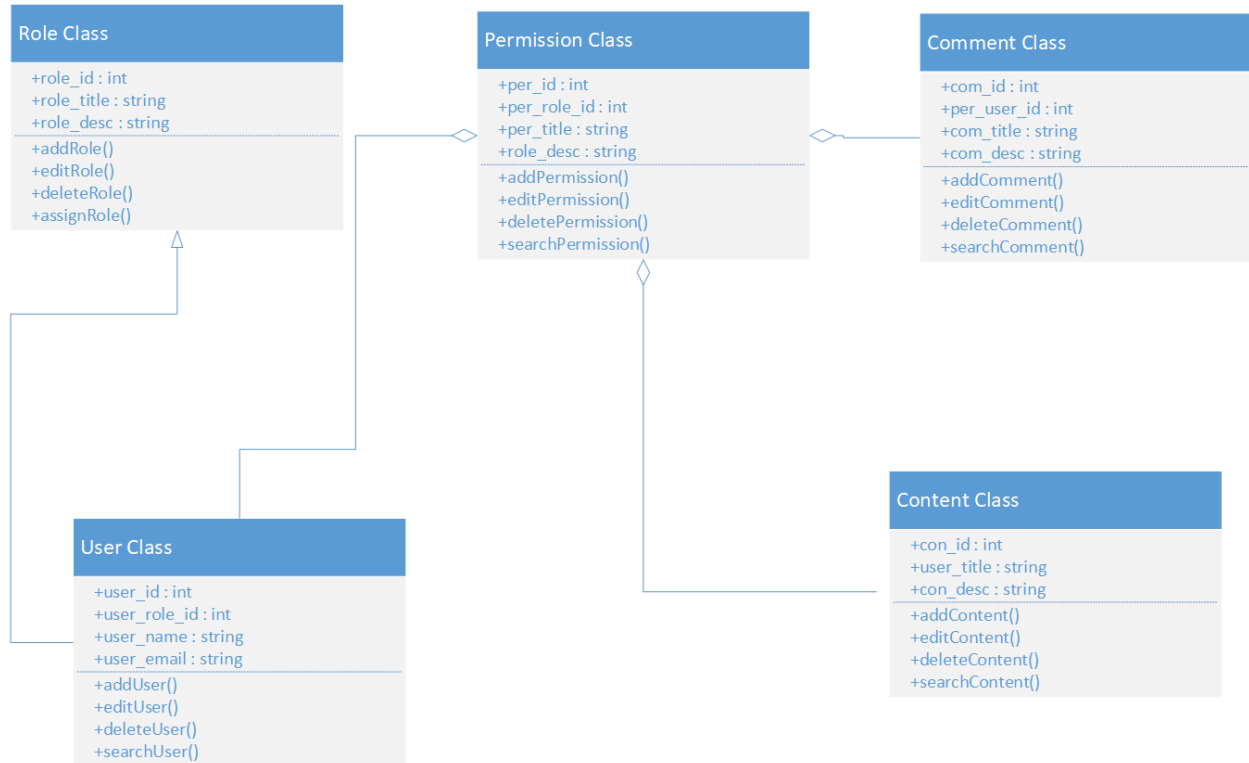


Figure 9. 3: Class Diagram

## 9.5 Sequence Diagram

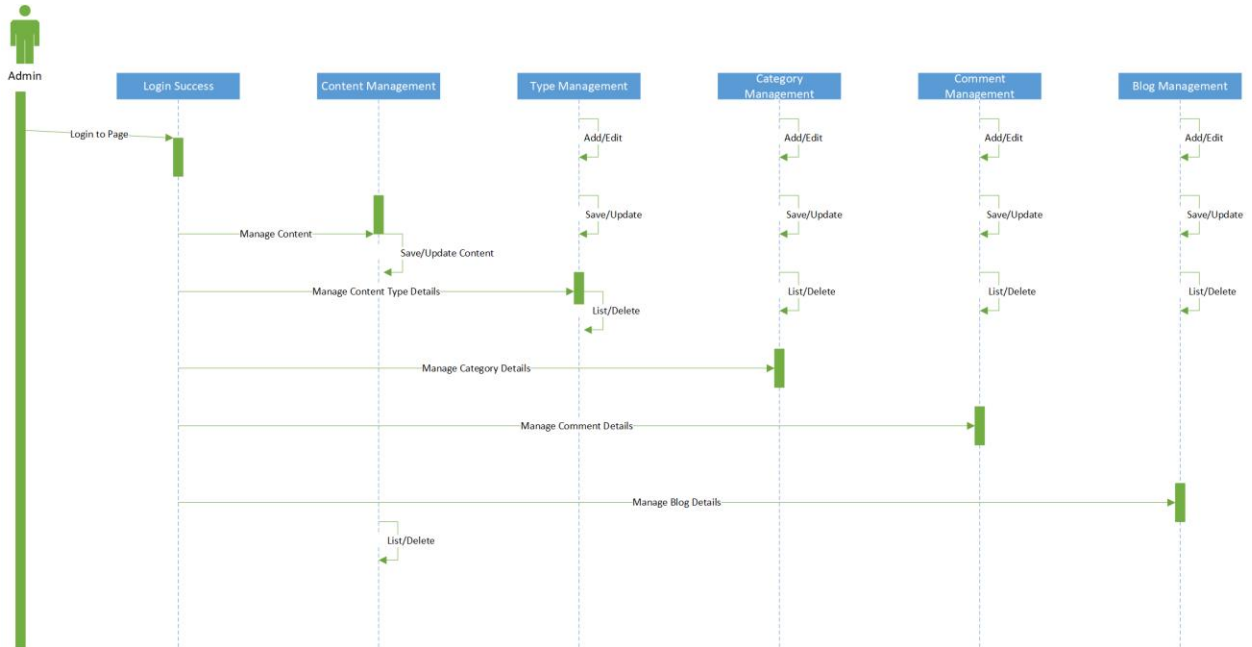


Figure 9. 4: Sequence Diagram

## 9.6 Component Diagram

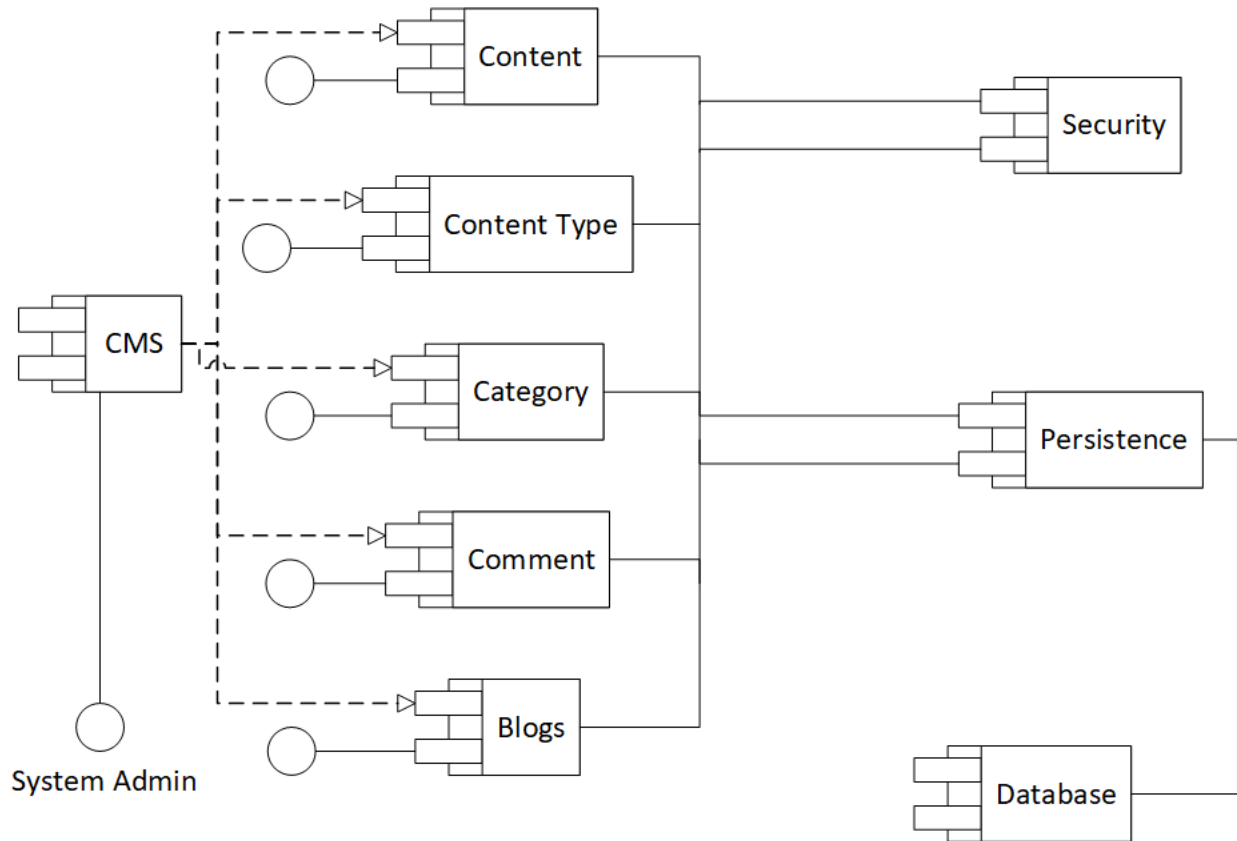


Figure 9. 5: Component Diagram

## 9.7 Deployment Diagram

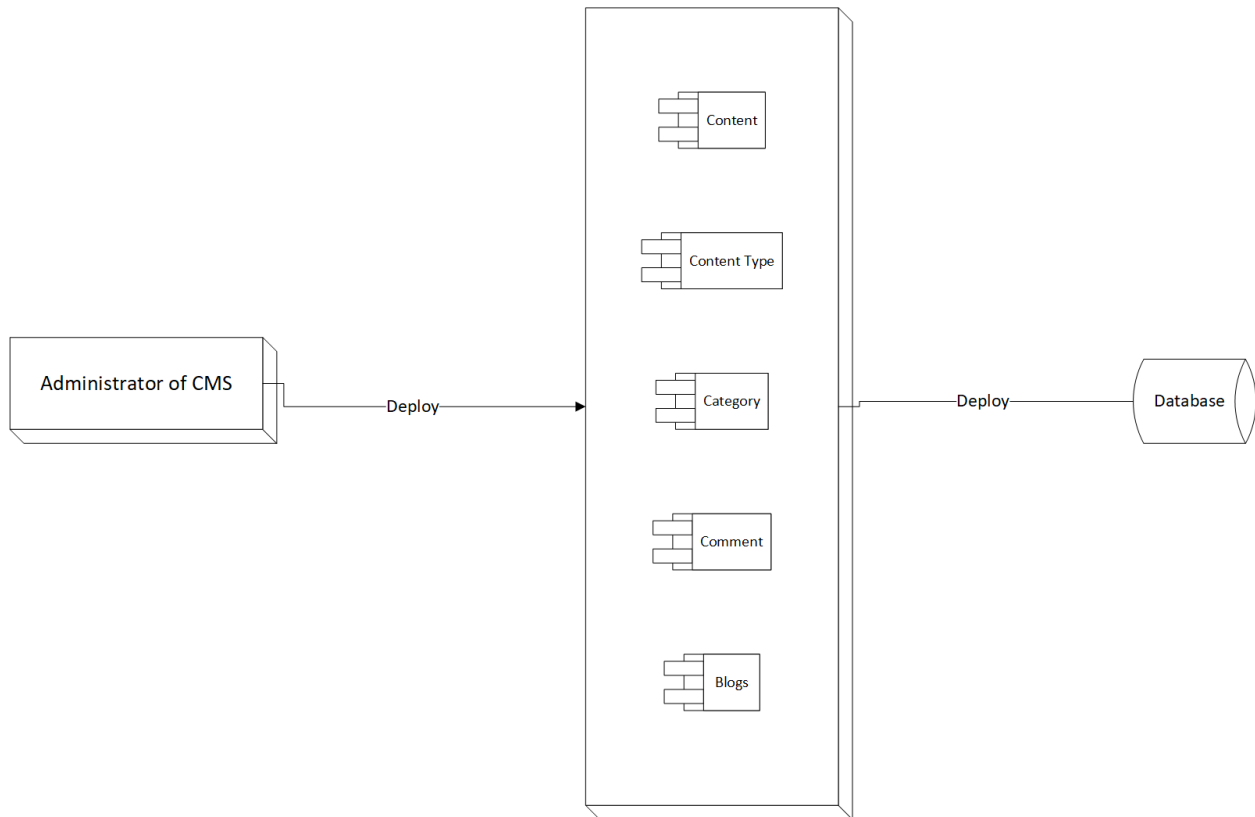


Figure 9. 6: Deployment Diagram

## 9.8 System Interface Design / Prototype



Figure 9. 7: Front-end Design of Securex

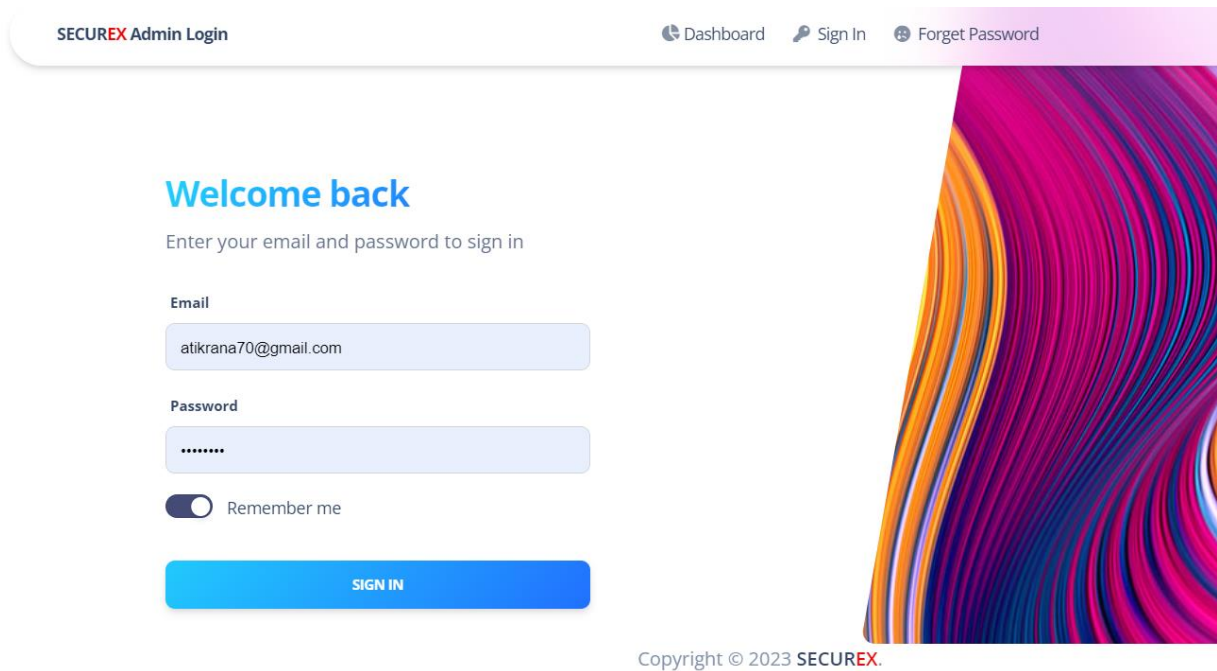


Figure 9. 8: Back-end Admin Login

Name

Email

New Password

**CREATE**

**Users table**

USER	EMAIL	LAST LOGIN TIME	LAST LOGIN IP	Action
Mazharul Islam	masum@admin.com	2022-09-07 11:39 pm	::1	<b>DELETE</b>
azmi@securexbd.com	azmi@securexbd.com	Didn't login yet		<b>DELETE</b>
Md. Rakib Hossain	rakib@securexbd.com	2023-05-24 09:59 am	116.68.202.81	<b>DELETE</b>




Figure 9. 9: User Page Interface

## Chapter 10 - Deployment/Development

### 10.1 Core Module Coding Sample

```
1  <?php
2
3  /**
4   * Laravel - A PHP Framework For Web Artisans
5   *
6   * @package  Laravel
7   * @author   Taylor Otwell <taylor@laravel.com>
8   */
9
10 $uri = urldecode(
11     parse_url($_SERVER['REQUEST_URI'], PHP_URL_PATH)
12 );
13
14 // This file allows us to emulate Apache's "mod_rewrite" functionality from the
15 // built-in PHP web server. This provides a convenient way to test a Laravel
16 // application without having installed a "real" web server software here.
17 if ($uri !== '/' && file_exists(__DIR__.'/public'.$uri)) {
18     return false;
19 }
20
21 require_once __DIR__.'/public/index.php';
22
```

Figure 10. 1: Server Code Sample

```

1  /*
2  | tailwindcss v3.0.23 | MIT license | https://tailwindcss.com
3  */
4  1. Prevent padding and border from affecting element width. (https://github.com/mozdevs/cssremedy/issues/4)
5  2. Allow adding a border to an element by just adding a border-width. (https://github.com/tailwindcss/tailwindcss/pull/116)
6  */
7
8  *,
9  ::before,
10 ::after {
11   box-sizing: border-box; /* 1 */
12   border-width: 0; /* 2 */
13   border-style: solid; /* 2 */
14   border-color: #e5e7eb; /* 2 */
15 }
16
17 ::before,
18 ::after {
19   --tw-content: '';
20 }
21
22 /*
23 1. Use a consistent sensible line-height in all browsers.
24 2. Prevent adjustments of font size after orientation changes in iOS.
25 3. Use a more readable tab size.
26 4. Use the user's configured `sans` font-family by default.
27 */
28
29 html {
30   line-height: 1.5; /* 1 */
31   -webkit-text-size-adjust: 100%; /* 2 */
32   -moz-tab-size: 4; /* 3 */
33   -o-tab-size: 4;
34   tab-size: 4; /* 3 */
35   font-family: Nunito, ui-sans-serif, system-ui, -apple-system, BlinkMacSystemFont, "Segoe UI", Roboto, "Helvetica Neue", Arial, "Noto Sans", sans-;
36 }
37
38 /*
39 1. Remove the margin in all browsers.
40 2. Inherit line-height from `html` so users can set them as a class directly on the `html` element.
41 */
42
43 body {
44   margin: 0; /* 1 */
45   line-height: inherit; /* 2 */

```

Figure 10. 2: App-CSS Code Sample



```

1 <?php
2
3 namespace Tests\Feature;
4
5 use App\Models\User;
6 use App\Providers\RouteServiceProvider;
7 use Illuminate\Foundation\Testing\RefreshDatabase;
8 use Tests\TestCase;
9
10 class AuthenticationTest extends TestCase
11 {
12     use RefreshDatabase;
13
14     public function test_login_screen_can_be_rendered()
15     {
16         $response = $this->get('/login');
17
18         $response->assertStatus(200);
19     }
20
21     public function test_users_can_authenticate_using_the_login_screen()
22     {
23         $user = User::factory()->create();
24
25         $response = $this->post('/login', [
26             'email' => $user->email,
27             'password' => 'password',
28         ]);
29
30         $this->assertAuthenticated();
31         $response->assertRedirect(RouteServiceProvider::HOME);
32     }
33
34     public function test_users_can_not_authenticate_with_invalid_password()
35     {
36         $user = User::factory()->create();
37
38         $this->post('/login', [
39             'email' => $user->email,
40             'password' => 'wrong-password',
41         ]);
42
43         $this->assertGuest();
44     }
45 }

```

Figure 10. 3: Authentication Code Sample

```

1  <?php
2
3  namespace App\Models;
4
5  use Illuminate\Database\Eloquent\Factories\HasFactory;
6  use Illuminate\Database\Eloquent\Model;
7
8  class Blog extends Model
9  {
10     use HasFactory;
11     protected $fillable=[
12         'date',
13         'month',
14         'type',
15         'title',
16         'short_description',
17         'description',
18         'image',
19         'another1',
20         'another2',
21         'another3',
22         'user',
23     ];
24 }
25

```

Figure 10. 4: Blog Code Sample

```

1  <?php
2
3  namespace App\Models;
4
5  use Illuminate\Database\Eloquent\Factories\HasFactory;
6  use Illuminate\Database\Eloquent\Model;
7
8  class Client extends Model
9  {
10     use HasFactory;
11     protected $fillable=[
12         'client_type',
13         'client_name',
14         'client_image',
15         'user',
16     ];
17 }
18

```

Figure 10. 5: Client Code Sample

```

1  <?php
2
3  namespace App\Console;
4
5  use Illuminate\Console\Scheduling\Schedule;
6  use Illuminate\Foundation\Console\Kernel as ConsoleKernel;
7
8  class Kernel extends ConsoleKernel
9  {
10     /**
11      * Define the application's command schedule.
12      *
13      * @param \Illuminate\Console\Scheduling\Schedule $schedule
14      * @return void
15      */
16     protected function schedule(Schedule $schedule)
17     {
18         // $schedule->command('inspire')->hourly();
19     }
20
21     /**
22      * Register the commands for the application.
23      *
24      * @return void
25      */
26     protected function commands()
27     {
28         $this->load(__DIR__.'/Commands');
29
30         require base_path('routes/console.php');
31     }
32 }
33

```

Figure 10. 6: Kernel Code Sample

```

1  <?php
2
3  namespace App\Listeners;
4
5  use Illuminate\Contracts\Queue\ShouldQueue;
6  use Illuminate\Queue\InteractsWithQueue;
7
8  class LoginListener
9  {
10     /**
11      * Create the event listener.
12      *
13      * @return void
14      */
15     public function __construct()
16     {
17         //
18     }
19
20     /**
21      * Handle the event.
22      *
23      * @param object $event
24      * @return void
25      */
26     public function handle($event)
27     {
28         $event->user->update([
29             'last_login_time' => now(),
30             'last_login_ip' => request()->getClientIp(),
31             'client' => request()->userAgent(),
32         ]);
33     }
34 }
35

```

Figure 10. 7: Login Listener Code Sample

```

1  <?php
2
3  namespace App\Mail;
4
5  use Illuminate\Bus\Queueable;
6  use Illuminate\Contracts\Queue\ShouldQueue;
7  use Illuminate\Mail\Mailable;
8  use Illuminate\Queue\SerializesModels;
9
10 class Mail extends Mailable
11 {
12     use Queueable, SerializesModels;
13
14     /**
15      * Create a new message instance.
16      *
17      * @return void
18      */
19     public function __construct()
20     {
21         //
22     }
23
24     /**
25      * Build the message.
26      *
27      * @return $this
28      */
29     public function build()
30     {
31         return $this->view('view.name');
32     }
33 }
34

```

Figure 10. 8: Mail Code Sample

```
1 <?php
2
3 namespace Tests;
4
5 use Illuminate\Foundation\Testing\TestCase as BaseTestCase;
6
7 abstract class TestCase extends BaseTestCase
8 {
9     use CreatesApplication;
10 }
11
```

Figure 10. 9: Test Case Code Sample

```

1  <?php
2
3  namespace App\Models;
4
5  use Illuminate\Contracts\Auth\MustVerifyEmail;
6  use Illuminate\Database\Eloquent\Factories\HasFactory;
7  use Illuminate\Foundation\Auth\User as Authenticatable;
8  use Illuminate\Notifications\Notifiable;
9  use Laravel\Fortify\TwoFactorAuthenticatable;
10 use Laravel\Jetstream\HasProfilePhoto;
11 use Laravel\Sanctum\HasApiTokens;
12
13 class User extends Authenticatable
14 {
15     use HasApiTokens;
16     use HasFactory;
17     use HasProfilePhoto;
18     use Notifiable;
19     use TwoFactorAuthenticatable;
20
21     /**
22      * The attributes that are mass assignable.
23      *
24      * @var string[]
25      */
26     protected $fillable = [
27         'name',
28         'email',
29         'password',
30         'last_login_time',
31         'last_login_ip',
32         'client',
33     ];
34
35     /**
36      * The attributes that should be hidden for serialization.
37      *
38      * @var array
39      */
40     protected $hidden = [
41         'password',
42         'remember_token',
43         'two_factor_recovery_codes',
44         'two_factor_secret',
45     ];
46

```

Figure 10. 10: User Code Sample

```

1  <?php
2
3  namespace Database\Factories;
4
5  use App\Models\Team;
6  use App\Models\User;
7  use Illuminate\Database\Eloquent\Factories\Factory;
8  use Illuminate\Support\Str;
9  use Laravel\Jetstream\Features;
10
11 class UserFactory extends Factory
12 {
13     /**
14      * The name of the factory's corresponding model.
15      *
16      * @var string
17      */
18     protected $model = User::class;
19
20     /**
21      * Define the model's default state.
22      *
23      * @return array
24      */
25     public function definition()
26     {
27         return [
28             'name' => $this->faker->name(),
29             'email' => $this->faker->unique()->safeEmail(),
30             'email_verified_at' => now(),
31             'password' => '$2y$10$92lXUNpkj00r0Q5byMi.Ye4oKoEa3Ro9llC/.og/at2.uheWG/igi', // password
32             'remember_token' => Str::random(10),
33         ];
34     }
35
36     /**
37      * Indicate that the model's email address should be unverified.
38      *
39      * @return \Illuminate\Database\Eloquent\Factories\Factory
40      */
41     public function unverified()
42     {
43         return $this->state(function (array $attributes) {
44             return [
45                 'email_verified_at' => null,

```

Figure 10. 11: User Factory Code Sample



## 10.2 Possible problem breakdown

It is pretty challenging to complete a big assignment properly all at once. Additionally, it will take a long time. If the work can be broken down into small portions, it will be easier to finish and will need less time overall. There may be several issues that crop up when a CMS project is being developed that might impede development or have an adverse effect on its deployment. Here are some potential areas where issues could arise:

- Technical problems might include integration challenges with various software components, browser or device compatibility problems, performance constraints, or scaling issues.
- Data organization, data transfer from current systems, data security, and data backup and recovery are some areas that might experience issues.
- Getting used to new processes, user interfaces, or functionalities is difficult.
- Problems can occur when creating material, approving it, controlling its version, and releasing it.
- It can be challenging to balance the demand for customization and the system's adaptability and upgradeability.
- Sensitive data may be in danger due to flaws in the CMS software or insufficient security setups.

Here are some approaches to take into account for dealing with the potential issues found in a CMS project:

### **Technical Difficulties**

- Conduct extensive testing and quality control procedures to spot and fix technical faults immediately.
- Work with technical consultants or specialists to solve challenging integration or performance issues.

- Implement scalability methods to ensure the system can accommodate growing user and content demands, such as load balancing or cloud hosting.

### **Issues with data management**

- Create a thorough data management strategy that addresses data organization, migration, and security.
- Implement reliable backup and recovery procedures to protect the availability and integrity of your data.
- To secure sensitive user information, follow industry best practices and data privacy laws.

### **Flexibility and Personalization**

- Based on how they may affect the stability and maintainability of the system, evaluate customization requests.
- Choose flexible CMS systems without sacrificing the system's essential functionality.
- To ensure long-term sustainability, strike a balance between personalization and system improvements.

### **Vulnerabilities in security**

- Update the CMS software and associated components often to fix security flaws.
- To safeguard user accounts, utilize secure authentication techniques like two-factor authentication.
- To find and fix possible vulnerabilities, conduct frequent security audits and penetration tests.

These techniques may reduce potential problems and guarantee the CMS project's effective implementation. They should also be closely followed as the project moves forward.

### 10.3 Prioritization While Developing

Prioritizing the demand is crucial while developing a system. According to the MoSCoW standard, I have previously ranked the prerequisite list in order of importance. I am now outlining the list of the SECUREX development needs I will follow in order of priority.

<b>Priority Serial</b>	<b>Requirement</b>
1	User authentication and access control.
2	Content creation and editing.
3	Responsive design.
4	Content storage and retrieval.
5	Search functionality.
6	Content categorization and tagging.

Table 10. 1: Priority list while developing

# Chapter 11 – Testing

## 11.1 Test Plan Acceptance

The appropriate stakeholders' assessment and approval of the test plan is a crucial stage in the software testing process. It guarantees that the test strategy is thorough, clearly stated, and aligned with the project's goals. Accepting a test plan entails assessing its scope, objectives, deliverables, timetable, and resources to ensure it successfully achieves the project's quality objectives.

Two significant forms of software testing, functional and non-functional, concentrate on specific facets of the tested system.

### **Functional Testing**

Functional testing confirms and validates a system's or software application's functioning. It guarantees that the program operates as intended and satisfies the listed functional criteria. Functional testing entails checking that each system's features, components, and functions operate as intended and yield the desired outcomes. It checks whether the system complies with the functional requirements and user expectations. Functional testing seeks to find flaws or deviations from the intended functionality and guarantee that the program performs as intended.

The following list of three functional testing types includes:

#### Unit Testing

- Validation of input fields.
- Filtering for selected kinds.
- Conversion filtering in the list, for processing, pending, in realization, contact in the future, erroneous, unobtained.

#### Module Testing

- Submit the login form without a username or password.
- Invalid login information or registration information.

- Submit a form with accurate or correct information.

### Integration Testing

- Log in using the correct login information.
- Successful addition and updating of personal data.

### Non-functional Testing

Non-functional testing assesses the software's performance and quality qualities outside its functional needs. The software's scalability, dependability, usability, performance, security, and other non-functional elements are evaluated. Non-functional testing aims to evaluate how the system behaves and functions under various circumstances, such as high loads, stress, or security concerns. It assists in locating possible problems with the software's functionality, usability, security, and other non-functional features.

Non-functional testing can be divided into many groups:

- Security Testing
- Usability Testing
- Acceptance Testing
- Accessibility Testing

## 11.2 Test Case

A test case is a predetermined set of circumstances or procedures intended to confirm the operation or behavior of a software program or system. It is a thorough explanation of a particular test scenario that lists the inputs, anticipated results, and the procedures to be followed when carrying out the test. Test cases are developed based on the system's functional and non-functional criteria and are used as a guide by testers to confirm that the software adheres to the intended standards [11].

### Unit test – test case

<b>Test Case Name</b>	<b>Unit Test</b>		
<b>Test Class</b>			
<b>Test Description</b>			
<b>Source of Data</b>	<b>Test Steps</b>	<b>Expected Result</b>	<b>Actual Result</b>

Table 11. 1: Unit test – test case

### Module test – test case

<b>Test Case Name</b>	<b>Module Test</b>		
<b>Test Class</b>			
<b>Test Description</b>			
<b>Source of Data</b>	<b>Test Steps</b>	<b>Expected Result</b>	<b>Actual Result</b>

Table 11. 2: Module test – test case

### Integration test – test case

Test Case Name	Integration Test		
Test Class			
Test Description			
Source of Data	Test Steps	Expected Result	Actual Result

Table 11. 3: Integration test – test case

### 11.3 Unit Testing

#### Unit Test - 1 - Test Case

Test Case Name	Unit Test		
Test Class	User create controller		
Test Description	Validation of a User's name while creating a user list		
Source of Data	Test Steps	Expected Result	Actual Result

<b>Admin</b>	<ol style="list-style-type: none"> <li>Complete all fields on the form except the required user name.</li> <li>Fill out the form and submit it.</li> </ol>	This field requires an error SQL message to appear while trying to create a user.	A message appears that the field is required for creating the users.
--------------	--	---	--

Table 11. 4: Unit test - 1 - test case

The screenshot shows a web application interface for user registration. At the top left, it says 'Pages / User' and 'User'. At the top right, there is a gear icon, the name 'MD ATIKUR RAHMAN', and a 'Log Out' button with a dropdown arrow. The form contains three input fields: 'Name' (empty), 'Email' (containing 'atikur16-451@diu.edu.bd'), and 'Password' (masked with dots). Below the fields is a dark blue button labeled 'CREATE'.

Figure 11. 1: Unit test – 1.1

```

C:\xampp8.1.2\htdocs\test2\
Illuminate\Database\QueryException
SQLSTATE[23000]: Integrity constraint violation: 1048 Column 'name' cannot be null (SQL: insert into `users` (`name`, `email`, `password`, `created_at`) values (?, atikur16-451@diu.edu.bd, $2y$10$Dmi442/koZ.0PmvS..7qm.PAkI44daGEzmewKYEPccMfCtoZ04Ize, 2023-07-02 07:02:13))
http://127.0.0.1:8000/add/user

```

Figure 11. 2: Unit test – 1.2



## Unit Test - 2 - Test Case

Test Case Name	Unit Test		
Test Class	The controller of User creation.		
Test Description	User add and check.		
Source of Data	Test Steps	Expected Result	Actual Result
Admin	<ol style="list-style-type: none"> <li>1. Filled out the form with all information.</li> <li>2. Submit the form.</li> </ol>	After entering and saving all information, it will go to this specific user details page.	After entering and saving all information, it will go to this specific user details page.

Table 11. 5: Unit test - 2 - test case

Pages / User

User

MD ATIKUR RAHMAN Log Out

atik

atikur16-451@diu.edu.bd

.....

CREATE

Figure 11. 3: Unit test – 2.1

Pages / User MD ATIKUR RAHMAN Log Out

**User**

Name

Email

New Password

**CREATE**

**Users table**

USER	EMAIL	LAST LOGIN TIME	LAST LOGIN IP	Action
atik	atikur16-451@dlu.edu.bd	Didn't login yet		<b>DELETE</b>

Figure 11. 4: Unit test – 2.2

## 11.4 Module Testing

### Module Test - 1 - Test Case

Test Case Name	Module Test		
Test Class	The controller of User creation.		
Test Description	Make a user attempt without entering any information.		
Source of Data	Test Steps	Expected Result	Actual Result

<b>Admin</b>	<ol style="list-style-type: none"> <li>1. Log in to the system</li> <li>2. Go to the user page and click add record.</li> <li>3. Click the save button without giving any data.</li> </ol>	This field is required SQL message will appear for the required field.	This field is required SQL message will appear for the required field.
--------------	--	--	--

Table 11. 6: Module test - 1 - test case

The screenshot shows a web interface for user registration. At the top left, it says 'Pages / User' and 'User'. At the top right, there is a user profile 'MD ATIKUR RAHMAN' and a 'Log Out' button. Below the header are three input fields: 'Name', 'Email', and 'New Password'. At the bottom of the form is a dark blue button labeled 'CREATE'.

Figure 11. 5: Module test – 1.1

```

C:\xampp8.1.2\htdocs\test2\
Illuminate\Database\QueryException
SQLSTATE[23000]: Integrity constraint violation: 1048 Column 'name' cannot be null (SQL: insert into `users` (`name`, `email`, `password`, `created_at`) values (?, ?, $2y$10$Wku9NGp4/fC.rT7Bi/7VA.vKXA0aLVgbuF.jxUNK34yEYg6M9z1Zi, 2023-07-02 07:07:02))
http://127.0.0.1:8000/add/user

```

Figure 11. 6: Module test – 1.2

## Module Test - 2 - Test Case

Test Case Name	Module Test		
Test Class	The controller of Contact creation.		
Test Description	Make a contact attempt using a data format that is not valid.		
Source of Data	Test Steps	Expected Result	Actual Result
Admin	<ol style="list-style-type: none"> <li>1. Log in to the system</li> <li>2. Go to the user page and click add record.</li> <li>3. Click the save button, giving an invalid data format.</li> </ol>	Please enter a valid email address message that will be appeared for the invalid data.	Please enter a valid email address message that will be appeared for the invalid data.

Table 11. 7: Module test - 2 - test case

The screenshot shows a web form with three input fields. The first field contains 'atik', the second contains 'atikrana70', and the third contains '.....'. A red error message box is displayed over the second field, stating: 'Please include an '@' in the email address. 'atikrana70' is missing an '@'. Below the fields is a dark blue button with a white cursor icon and the text 'CREATE'.

Figure 11. 7: Module test – 2

## 11.5 Integration Testing

## Integration Test - 1 - Test Case

Test Case Name	Integration Test		
Test Class	The controller of Authentication.		
Test Description	Login with valid credentials and redirect to the dashboard.		
Source of Data	Test Steps	Expected Result	Actual Result
Admin	<ol style="list-style-type: none"> <li>1. Just go to the URL</li> <li>2. Enter all of your correct usernames and password.</li> <li>3. Click on the right-side arrow button.</li> </ol>	If the credential is correct, it will redirect to the dashboard.	If the credential is correct, it will redirect to the dashboard.

Table 11. 8: Integration test - 1 - test case

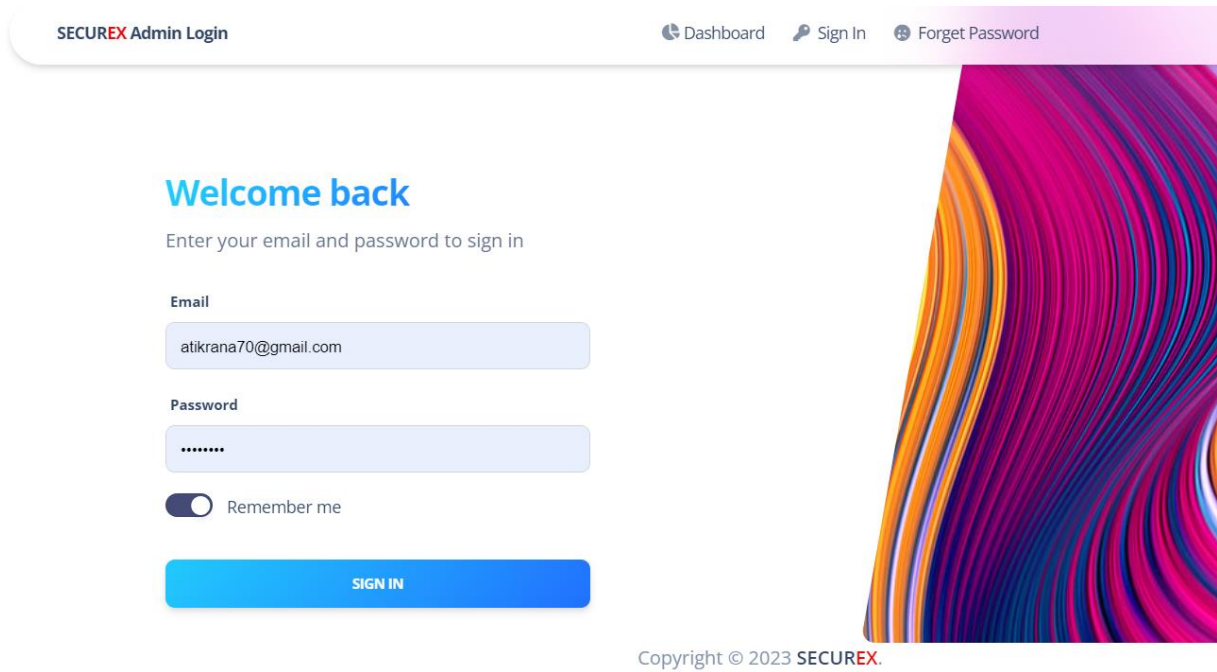


Figure 11. 8: Integration test – 1

### Integration Test - 2 - Test Case

Test Case Name	Integration Test		
Test Class	Personal info controller		
Test Description	Personal information adds and edits the information.		
Source of Data	Test Steps	Expected Result	Actual Result
Admin	<ol style="list-style-type: none"> <li>Navigate to the page called My Preferences.</li> <li>Click on the edit option.</li> <li>Change the required information.</li> </ol>	All information was updated successfully.	All information was updated successfully.

Table 11. 9: Integration test - 2 - test case

Update Profile Information

Name

MD ATIKUR RAHMAN

Email

atikrana70@gmail.com

New Password

Atik1234

Update

Figure 11. 9: Integration test – 2

## Chapter 12 – Implementation

### 12.1 Training

In this context, transferring information, skills, and expertise to individuals or teams engaged in software development activities is called training. By improving their knowledge of software development principles, procedures, tools, and techniques, it attempts to equip employees with the skills necessary to carry out their duties successfully and efficiently. Programming languages, development frameworks, software architecture, database administration, quality assurance, project management, and software testing are just a few subjects that may be covered in software development training. The training courses may be customized to specific tasks or responsibilities within the software development lifecycle and can be created at different skill levels, from beginner to advanced. Training in software development has several different goals. First, it gives people the technical know-how and abilities to create high-caliber software programs. This involves mastering development tools, knowing computer languages, comprehending design ideas, and implementing best practices in coding and testing. Understanding software development approaches and procedures is facilitated by training in the field. This entails studying waterfall models, agile processes, and other development philosophies. It aids people in comprehending the value of requirement collecting, project planning, teamwork, and continual improvement throughout the development lifecycle.

Additionally, soft skills development is frequently emphasized in software development training. Successful software development requires strong interpersonal, collaboration, problem-solving, and critical thinking abilities. Workshops, group activities, and case studies may be included in training programs to improve these abilities and foster a supportive and effective work environment.

Below is a table that details SECUREX's training procedures:



SN.	User	Training Scope	Time Period	Comment
1	Admin	Successfully create users, clients, contacts, blogs, and occurrences and how build a database to keep those bits of data. How can the administrator edit the information above correctly? The data the administrator added while registering in the system will be editable. The necessary field that is required for developing the function mentioned above will be covered in administrative training.	4 hours	All the operators and functions are simple for the admin to comprehend.

Table 12. 1: Admin Training

### 12.2 Big Bang

The Big Bang technique, used in software development, is a methodology that involves the simultaneous execution of all parts or modules of a software system without any predetermined or gradual phases. The complete system is designed and integrated simultaneously, with no intermediary testing or validation steps. This is a high-risk, high-reward method. In the Big Bang method, programmers construct each module separately before fusing them to create the entire system. After all the modules have been created, the system as a whole is tested after merging them. This strategy is frequently used when a short deadline or system needs are precise and stable. Since all modules are built simultaneously, one of the critical benefits of the Big Bang technique is that it can lead to quicker development and deployment. It enables rapid system delivery without the requirement for incremental revisions. It may also be appropriate for small-scale projects with specific needs and little complexity. The Big Bang strategy, however, also entails considerable dangers. There is no incremental testing or validation. Hence there is a significant likelihood that

serious flaws or bugs will be found during the integration phase. It may make locating and fixing problems more complex, lowering the system's overall quality. Furthermore, if any substantial faults are found during testing, it may have a negative effect on the project's budget and schedule.

The project needs, complexity, and related risks should all be considered before deciding whether to use the Big Bang technique. It is often advised for small, clearly defined projects where risks can be efficiently handled and there is a high degree of trust in the system requirements.

### 12.3 Scaling

The DCL team leader oversaw the scalability of this project. I received no information regarding this scaling acceptance throughout my internship.

### 12.4 Load balancing

The technique of equally dividing workload or network traffic among several resources or servers is known as load balancing, and it is done to guarantee that a system or application performs as well as it possibly can, is scalable, and is reliable. It is a method for controlling and allocating the incoming requests to be balanced and distributed, preventing any resource from becoming overloaded while maximizing resource use [12].

In situations with many incoming requests or where the burden is unevenly distributed, load balancing is crucial. Load balancing helps to prevent bottlenecks, speed up response times, and guarantee that the system can manage the load by dividing the requests equitably among several servers or resources.

## Chapter 13 – Critical Appraisal and Evaluation

### 13.1 Objective that could be met

Every system in use is imperfect in some way. Updates are always conceivable. I have attempted to complete all requirements for a CMS to operate and utilize this system successfully. Nevertheless, several conditions could be met. Which are:

- Analytical dashboard for admin.
- Collaboration with other users.
- Integration with third-party systems.
- Security and data protection.

#### 13.1.1 Success rate against each objective

Each objective's success rate is subjectively determined by several variables, including the execution strategy, the project team's experience, the resources available, and the organization's particular needs. I can, however, give a broad overview of the success rate of the goals mentioned above:

Analytical dashboard for admin: This goal often has a high success rate since it entails building a dashboard that gives administrators access to data visualization, analytics, and insights. It is comparatively doable to create an analytical dashboard that satisfies the unique requirements of administrators, thanks to the availability of contemporary data visualization technologies and frameworks.

Collaboration with other users: Depending on the complexity of the necessary collaboration features and the degree of interaction with other system components, the success rate of this target may vary. Implementing fundamental collaboration capabilities like content sharing, commenting, and version control may be relatively simple. However, more complex collaboration tools like real-time editing or concurrent content creation could need more work and knowledge.

Integration with third-party systems: The success rate of integration with external systems depends on the accessibility and compatibility of APIs, documentation, and the quality of support the other systems offer. Precise integration requirements and widely used, well-documented APIs may improve success rates. However, difficulties could occur if the third-party system has few or poorly described APIs or system compatibility problems.

Security and data protection: Every CMS project must have high security and data protection. The deployment of concrete security measures, adherence to industry best practices, frequent security audits, and prompt vulnerability patching are all necessary for this mission to be successful. A high degree of security may be attained through careful design, execution, and continuous monitoring. However, the requirement for ongoing security upgrades and emerging security threats may influence the success rate.

#### 13.1.2 How much better could have been done

The system is more current and fast than comparable systems because it was constructed using Laravel and, HTML5, Bootstrap. However, this SECUREX may also be an improvement over the existing setup. Although the existing system satisfies all CMS system criteria, it is not fully optimized. The dashboard is the first page once an admin logs into the system. However, the dashboard page is quite blunt and has no visual representation. Without this front-end issue, this system has no significant issues that might be resolved.

#### 13.1.3 Why it could not be done

DCL did not finalize the dashboard design, so I needed to leave it as it was. However, this system has every critical component. The features are effectively handled, secure, user-friendly, and speedy. The system is easy to use and understand.

## 13.2 Objectives totally not met/touched

The system has every functionality needed for a content management system. However, the chatbot functionality remained unaltered.

### 13.2.1 Why it could not be touched

The choice to integrate a chatbot function is based on the particular demands and requirements of the users. It was decided not to commit resources to create the chatbot capability since the CMS system's clients did not prioritize or need it.

## Chapter 14 – Lesson Learned

### 14.1 Pre Project – Review – Closing

Essentially, SECUREX is a web-based CMS solution. My organization built this system according to a predetermined framework that included gathering the client's requirements, planning the system's construction, choosing an architecture, and choosing a project name. After that, I used PHP, Laravel, and Bootstrap and produced project-specific documentation to construct this system. The SECUREX system is concerned with managing content, keeping user information up to date, and other things.

### 14.2 What I have learned

Throughout this project, I have learned much as a front-end development intern at Daffodil Computers Limited (DCL). The following are some of the main lessons:

I have been able to put the front-end development abilities I acquired in the classroom to use by working on this project. I have obtained practical expertise with JavaScript, CSS, and HTML to design responsive and engaging user interfaces. Being a member of a DCL development team has taught me the value of strong cooperation and collaboration. I have collaborated extensively with additional engineers, designers, and project managers to schedule tasks, exchange ideas, and guarantee the project's success. Through this initiative, I have had the chance to speak with clients personally and learn about their individual needs and expectations. I have learned how important it is to actively listen, communicate well, and translate customer requests into functional development tasks. This project has allowed me to practice Agile techniques, including daily stand-up meetings, sprint planning, and iterative development, because DCL uses an Agile methodology. I have improved my ability to respond to shifting demands, set priorities for my work, and provide incremental changes in response to customer input. I have faced various technical issues and glitches during the project that has called for problem-solving and troubleshooting abilities. This experience has improved my capacity to locate problems quickly and find solutions that maintain a positive user experience. The significance of lifelong learning

and keeping up with the most recent front-end development trends and technologies has been stressed through this internship. My professional development has been aided by the ability to investigate new frameworks, libraries, and best practices. Overall, working as a front-end developer intern at Daffodil Computers Limited has given me insightful knowledge about the real-world applications of front-end development, client engagement, collaboration, and the entire software development process. It has been a worthwhile learning experience that has strengthened my enthusiasm for front-end development and equipped me for the following positions in the sector.

### 14.3 The Problems I Have Faced

I encountered some obstacles during the process that needed severe consideration and problem-solving. Assuring the CMS system's interoperability with various web browsers and devices was one of the main concerns. I dealt with cross-browser compatibility concerns, responsive design, and device-specific optimization because front-end development entails developing interfaces that function flawlessly across numerous platforms. A major priority was making the interface simple and easy to use. To ensure users could browse and interact with the CMS system, I carefully considered user experience design concepts, including accessibility, navigation, and visual appeal. Time management was essential for this project, as it is for all others. Effective time management and prioritizing abilities were needed to handle many projects, communicate with the team, and fulfill deadlines.

Despite these difficulties, I attacked every issue head-on and with a proactive, problem-solving attitude. To overcome these obstacles and provide a successful CMS system, I sought advice from my mentors and peers, researched, and iteratively improved my ideas.

### 14.4 What Solution Occurred

I have created a solution for each of the difficulties I stated above and finished the system. I extensively tested and debugged many browsers and devices to address technical compatibility

concerns. Inconsistencies in layout or functionality were found and fixed so that users would have a consistent experience across all platforms. I used a variety of strategies, including code optimization, caching, and image optimization, to improve performance. The CMS's loading speed and general performance were greatly enhanced by lowering the file sizes and putting caching mechanisms into place. I carried out user research and incorporated user input into the design and development process to improve the user experience. I developed a user-friendly interface that increases user pleasure and usefulness by emphasizing straightforward navigation, clear labeling, and exciting interactions. I ensured open and frequent communication between team members, stakeholders, and clients to solve the difficulties successfully. I successfully resolved issues, offered updates, and solicited comments throughout the project by creating clear communication routes and encouraging participation.



## Chapter 15 – Conclusion

### 15.1 Summary of the Project

As a front-end developer intern, the project required creating a Content Management System (CMS) for Daffodil Computers Limited (DCL). The goal was to develop a powerful and intuitive CMS that enables effective website content management.

Throughout the project, I worked closely with the development team, stakeholders, and clients to comprehend their needs and convert them into functional specifications. In order to build and execute the CMS, I used my technical expertise and understanding of front-end technologies. Key features of the CMS were an administrative analytics dashboard, user collaboration tools, system connection with third parties, and robust data security safeguards. These features were carefully created and tested for the best performance and user experience. The project gave me beneficial learning opportunities that helped me build my technical abilities, get real-world front-end programming experience, and fortify my capacity for teamwork.

Additionally, I acquired abilities in project management, problem-solving, and requirement collection. In conclusion, the DCL CMS project was completed successfully, resulting in a feature-rich and intuitive content management system. It improved the effectiveness of website content management and gave DCL's online presence a strong base.

### 15.2 Goal of the Project

The project aimed to develop a robust and user-friendly content management system (CMS). By offering practical tools and features for content creation, editing, and publication, the CMS aims to simplify website content management. SECUREX's objectives are:

- Create a content management system (CMS) that is reliable and easy to use.
- Simplify the process of managing website content.
- Design a user-friendly user interface for simple content management.
- For seamless team communication, use tools like version control and collaboration.

- Make careful to implement robust access control security mechanisms.
- Improve efficiency and website management skills.
- Give your visitors a smooth user experience.

### 15.3 Success of the Project

We may claim it was successful when something achieves its objectives since the goals were met. According to the demands of the customer, the SECUREX system has achieved all of its objectives.

- The CMS achieves its objective of giving website content managers a reliable and user-friendly platform.
- For the CMS's streamlining content management process, they can generate, update, and publish material on their website.
- Team members now find maintaining and updating website content simpler because of the CMS's user-friendly design, which has enhanced productivity and efficiency.
- To prevent unauthorized access, the CMS has robust security measures in place.
- Visitors to the website now enjoy a seamless user experience that includes simple navigation, pertinent content, and an aesthetically pleasing design.

### 15.4 What I have done in the documentation

Since this is academic documentation, I had to complete this material according to the framework for academic documentation. In this documentation, I have detailed everything I did for the project. I started by writing an introduction to the system in the documentation, then I began the preliminary research for this project and gradually completed all the necessary processes for this system. All tables in this documentation were made using Microsoft Word, and any figures or diagrams were made using a third-party program.

## 15.5 Value of the Project

The Content Management System (CMS) is quite valuable for the organization. First and foremost, the CMS has given users a centralized platform to manage and update the content of their websites effectively. The organization's productivity has increased, and content management procedures have been simplified. Since it is now simple to generate, update, and publish material, website owners can better maintain the accuracy and relevance of the information available to users. Additionally, including collaboration and version control tools has improved teamwork inside the company. Team members may edit and create material simultaneously, eliminating bottlenecks and fostering productive teamwork. As a result, content updates are now made more quickly and are of higher quality.

Overall, by giving them a powerful content management system that boosts productivity, fosters collaboration, expands functionality, and assures data security, the CMS project has helped them achieve real value. Visitors to the user's website can benefit from an improved user experience and have access to current and pertinent material thanks to this value.

## 15.6 My Experience

First and foremost, I worked in a professional environment with seasoned developers and other industry experts. I was able to comprehend the workings of a real-world software development project and the value of strong cooperation and communication thanks to this experience. I participated in the project in many phases, including requirement analysis, design, implementation, and testing. My technical abilities, notably in HTML, CSS, PHP Laravel, BOOTSTRAP, and JavaScript, as well as frameworks and libraries frequently used in front-end development, have improved thanks to this practical experience. Working with the project team to convert customer requirements into functional and aesthetically pleasing web interfaces was one of the highlights of my experience. I contributed to the CMS's layout and design, ensuring content managers have an easy-to-use interface. This needed meticulous attention to detail and respect for web design best practices.

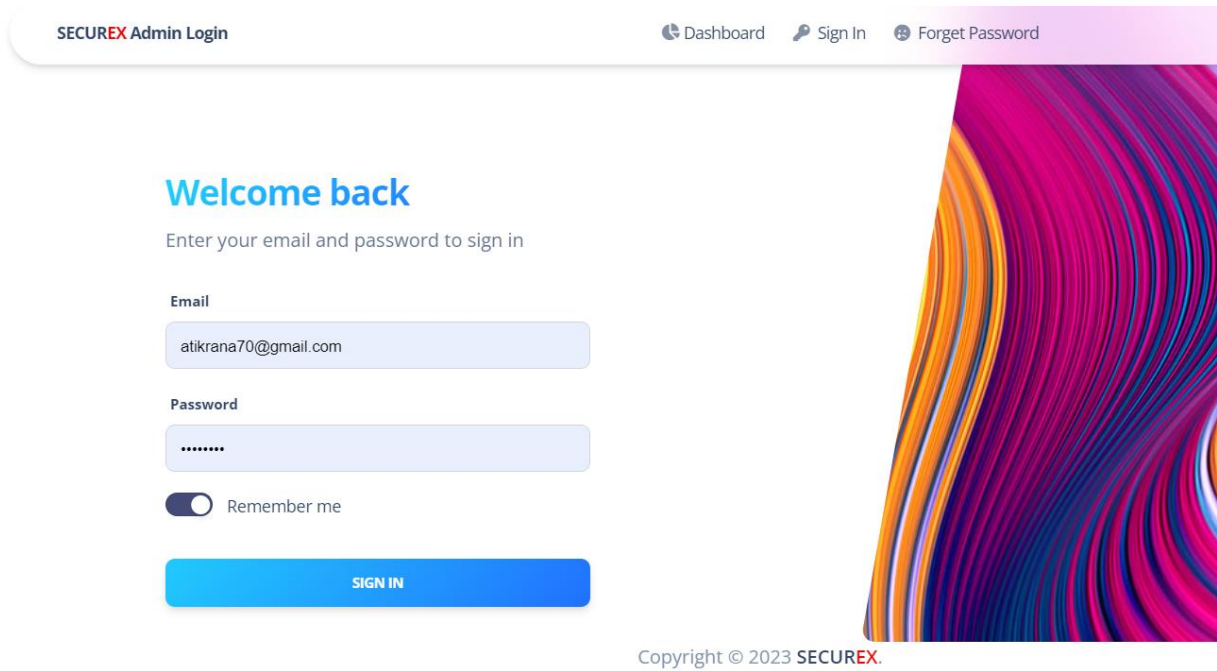
I had difficulties throughout the assignment, which helped me develop my problem-solving and critical-thinking abilities. I learned how to recognize and fix problems, work with team members to develop solutions, and adjust to shifting demands or limitations.

Overall, my time spent working on the CMS project at DCL as an intern front-end developer was priceless. It gave me helpful information, enhanced my technical competence, and introduced me to the difficulties and opportunities of real-world software development. I appreciate the chance to contribute to the project and the mentoring and support of my DCL colleagues and mentors.

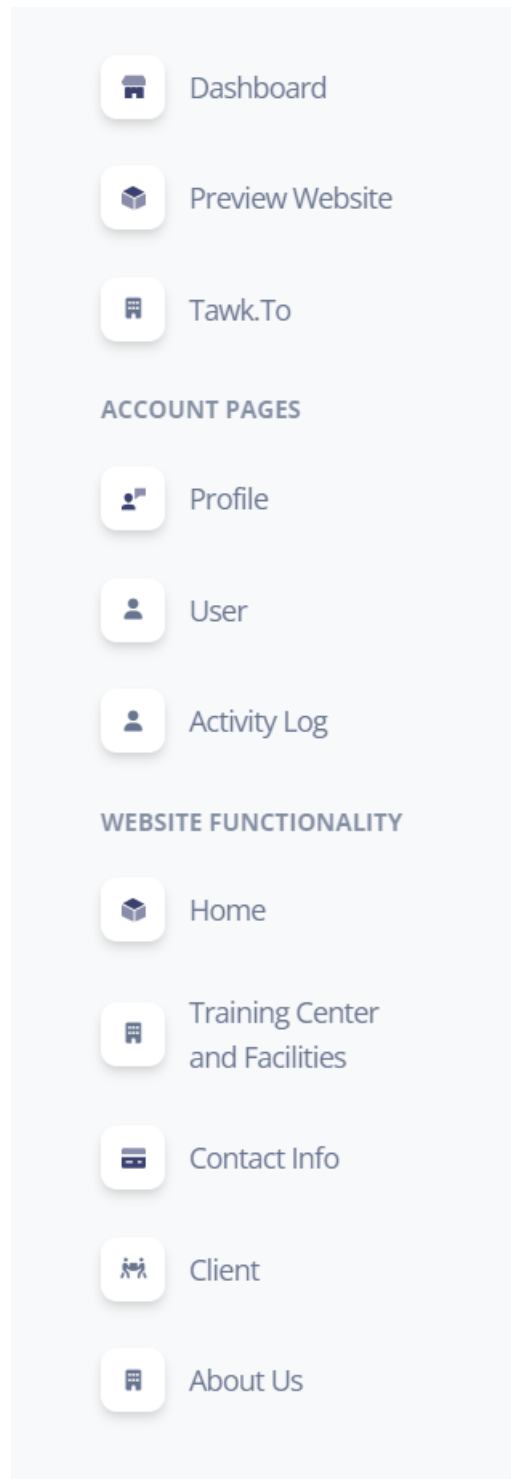
# Appendix

## User Guide

### Login Page



Provide login credentials to log in to the system.



After login, the navigation panel in the dashboard will be visible to you.



This website will be previewed after tapping the 'Website Preview' tab.

Update Profile Information

Name

Email

New Password

---

Login History

From the 'Profile' page, you can update your information.

Name

Email

New Password

**CREATE**

**Users table**

USER	EMAIL	LAST LOGIN TIME	LAST LOGIN IP	Action
Mazharul Islam	masum@admin.com	2022-09-07 11:39 pm	::1	<b>DELETE</b>
azmi@securexbd.com	azmi@securexbd.com	Didn't login yet		<b>DELETE</b>
Md. Rakib Hossain	rakib@securexbd.com	2023-05-24 09:59 am	116.68.202.81	<b>DELETE</b>

If needed, you can create your user information or delete other users in the 'User' tab.

Pages / User Activity

**User Activity**

MD ATIKUR RAHMAN Log Out

**Users Activity table**





USER	LOGIN TIME	MINUTES AGO
MD ATIKUR RAHMAN	2023-06-24 09:51 pm	5 minutes ago
MD ATIKUR RAHMAN	2023-06-21 01:52 pm	3 days ago
MD ATIKUR RAHMAN	2023-06-21 01:50 pm	3 days ago

The user activity table is in the 'User Activity' tab.



## Client

ADD CLIENT

Client Name	Client Link	Client Image	Action	Last Edited Time	Last Editor
			<a href="#">EDIT</a> <a href="#">DELETE</a>	2022-09-01 01:15 pm (9 months ago)	
			<a href="#">EDIT</a> <a href="#">DELETE</a>	2022-09-01 01:14 pm (9 months ago)	
			<a href="#">EDIT</a> <a href="#">DELETE</a>	2022-09-01 01:14 pm (9 months ago)	
			<a href="#">EDIT</a> <a href="#">DELETE</a>	2022-09-01 01:14 pm (9 months ago)	

< 1 2 3 4 5 6 >



You can view/add/edit/delete client details in the 'Client' tab.


## Office

Zonal Image

Choose File

No file chosen

SUBMIT

Image	Action	Last Edited Time	Last Editor
	<a href="#">DELETE</a>	2022-08-21 10:20 am (10 months ago)	

ADD OFFICE INFO

Office Name Or Type	Officer Name	Address	Primary Number
RAJSHAHI	Md. Nasir Uddin	Shoto bongram, Post: Shopura , Thana: Boalia, Near by Chondrima thana. Rajshahi.	01732-403939
RANGPUR	Md. Hafizur Rahman	Si Pi shen Road, Shen Para, Near by paira chottor, Rangpur City Corporation	01731-241596
CHATTOGRAM	Md. Sohel	C/O Shamim Lauge, 1331/A, Zakir Hossain BI-Lane, East Nasirabad, Khulshi Chittagong.	01787-650829






You can submit media files on the 'Contact' page.

## Browser Sessions

Manage and log out your active sessions on other browsers and devices.

If necessary, you may log out of all of your other browser sessions across all of your devices. Some of your recent sessions are listed below; however, this list may not be exhaustive. If you feel your account has been compromised, you should also update your password.

-  Windows - Chrome  
127.0.0.1, **This device**
-  Windows - Chrome  
127.0.0.1, Last active 4 hours ago
-  Windows - Chrome  
127.0.0.1, Last active 3 days ago

[LOG OUT OTHER BROWSER SESSIONS](#)

You can view/log out from your browser sessions in the 'Browser Session' tab.

## Mission Vision & Values

[ADD MISSION](#)

Vision	Values	Action	Last Edited Time
...ept of security for a safer society.	Teamwork, Integrity, Ownership, Commitment, and Trued.	<a href="#">EDIT</a> <a href="#">DELETE</a>	2023-05-14 10:17 am (1 month ago)

You can add/edit/delete your website's mission, vision & values here.

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# Plagiarism Report

## 192-16-451\_Atikur Rahman

*by* Atikur Rahman

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**Submission date:** 10-Jul-2023 12:15PM (UTC+0600)

**Submission ID:** 2128969404

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