

**SOCIAL ENGINEERING EDUCATIONAL
SYSTEM: SECURIFY**

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**Bachelor of Computer Science (Software
Engineering) with Honours**

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SOCIAL ENGINEERING EDUCATIONAL SYSTEM: SECURIFY

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Thesis submitted in fulfillment of the requirements
for the award of the degree of
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ABSTRAK

Peningkatan kelaziman serangan kejuruteraan sosial menimbulkan ancaman besar kepada individu dan organisasi. Untuk mengurangkan risiko ini, terdapat keperluan mendesak untuk sistem pendidikan yang berkesan yang menggalakkan kesedaran dan pemahaman taktik kejuruteraan sosial. Tesis ini membentangkan pembangunan Sistem Pendidikan Kejuruteraan Sosial yang komprehensif, dinamakan "Securify," bertujuan untuk melengkapkan pengguna dengan pengetahuan dan kemahiran yang diperlukan untuk mengenali dan mempertahankan diri daripada serangan kejuruteraan sosial.

Securify menggabungkan pelbagai ciri interaktif yang direka untuk melibatkan dan mendidik pengguna. Sistem ini menawarkan kuiz yang mensimulasikan senario kejuruteraan sosial kehidupan sebenar, membolehkan pengguna menguji pengetahuan dan kebolehan membuat keputusan mereka. Tambahan pula, bahan pendidikan, termasuk tutorial, video dan kajian kes, disediakan untuk meningkatkan pemahaman pengguna tentang pelbagai teknik kejuruteraan sosial dan tindakan balas. Selain itu, sistem ini menggabungkan bahagian berita dan blog, yang menawarkan kemas kini terkini tentang trend kejuruteraan sosial dan amalan terbaik.

Pembangunan Securify melibatkan fasa penyelidikan yang teliti, di mana analisis meluas taktik kejuruteraan sosial yang lazim dijalankan. Penyelidikan ini berfungsi sebagai asas untuk penciptaan kuiz berasaskan senario dan kandungan pendidikan yang mencerminkan senario kejuruteraan sosial dunia sebenar.

Untuk menilai keberkesanan Securify, kajian pengguna telah dijalankan melibatkan peserta daripada pelbagai latar belakang. Hasilnya menunjukkan peningkatan yang ketara dalam kesedaran dan pengetahuan peserta tentang kejuruteraan sosial, serta keupayaan yang dipertingkatkan untuk mengenal pasti dan bertindak balas terhadap potensi serangan kejuruteraan sosial.

Sistem Pendidikan Kejuruteraan Sosial, Securify, mengisi jurang penting dalam pendidikan keselamatan dengan menyediakan pengguna platform yang komprehensif dan interaktif untuk mengetahui tentang ancaman kejuruteraan sosial. Pendekatan berpusatkan pengguna sistem dan ciri menarik memperkasakan individu dan organisasi untuk membangunkan pertahanan proaktif terhadap serangan kejuruteraan sosial, dengan itu mengukuhkan postur keselamatan keseluruhan.

ABSTRACT

The growing prevalence of social engineering attacks poses a significant threat to individuals and organizations alike. To mitigate this risk, there is a pressing need for effective educational systems that promote awareness and understanding of social engineering tactics. This thesis presents the development of a comprehensive Social Engineering Educational System, named "Securify," aimed at equipping users with the knowledge and skills necessary to recognize and defend against social engineering attacks.

Securify incorporates a range of interactive features designed to engage and educate users. The system offers quizzes that simulate real-life social engineering scenarios, allowing users to test their knowledge and decision-making abilities. Furthermore, educational materials, including tutorials, videos, and case studies, are provided to enhance users' understanding of various social engineering techniques and countermeasures. Additionally, the system incorporates a news and blog section, which offers the latest updates on social engineering trends and best practices.

The development of Securify involved a meticulous research phase, where an extensive analysis of prevalent social engineering tactics was conducted. This research served as the foundation for the creation of scenario-based quizzes and educational content that reflect real-world social engineering scenarios.

To evaluate the effectiveness of Securify, a user study was conducted involving participants from diverse backgrounds. The results demonstrated a significant improvement in participants' awareness and knowledge of social engineering, as well as an enhanced ability to identify and respond to potential social engineering attacks.

The Social Engineering Educational System, Securify, fills a crucial gap in security education by providing users with a comprehensive and interactive platform to learn about social engineering threats. The system's user-centric approach and engaging features empower individuals and organizations to develop a proactive defense against social engineering attacks, thereby strengthening overall security posture.

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LIST OF ABBREVIATIONS

GUI	Graphical User Interface
IDE	Integrated Development Environment
SDLC	Software Development Life Cycle
UAT	User Acceptance Test

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CHAPTER 1

INTRODUCTION

1.1 Background of Study

Social engineering attacks have become a pervasive and escalating threat in today's interconnected world. Unlike traditional hacking techniques that primarily exploit technical vulnerabilities, social engineering leverages human psychology to manipulate individuals into divulging sensitive information or performing actions that compromise security. These attacks capitalize on trust, authority, and the willingness to help, making them highly effective and challenging to detect.

Social engineering scams are the most prevalent threat in Southeast Asian countries, with Malaysia reporting the highest encounter rate, followed by Indonesia, the Philippines, Singapore, and Vietnam. A survey by Kaspersky revealed that 97% of respondents in the region were aware of threats to e-payment platforms, and 72% had personally experienced such threats. Financial losses were generally capped at \$5,000, with bank account and credit card fraud being the main cause. Cyber incidents not only had financial implications but also had psychological effects, making respondents more vigilant and anxious about recovering lost funds. Trust in digital payment providers varied, with some expressing continued trust while others reported decreased trust. Some respondents blamed themselves for the incidents, and a few experienced misunderstandings with their loved ones as a result (The Malaysian Reserve, n.d.).

As technology advances and information becomes more accessible, social engineering tactics continue to evolve and adapt to exploit new avenues of attack (Mat et al., 2020). Phishing emails, phone scams, pretexting, and impersonation techniques are just a few examples of the wide range of methods employed by social engineers.

The success of social engineering attacks relies on the lack of awareness, knowledge, and preparedness among individuals and organizations. Many people are

unfamiliar with the techniques used by social engineers and fail to recognize the red flags or deceptive tactics employed in these attacks.

To address this critical knowledge gap and mitigate the risks associated with social engineering, this study aims to delve into the various aspects of social engineering, including the tactics, motivations, and impact on individuals and organizations. By increasing awareness and understanding of social engineering techniques, users can become better equipped to identify and defend against these attacks.

1.2 Problem Statement

In today's digital environment, social engineering assaults constitute a serious and growing threat by preying on human weaknesses to compromise security systems and obtain unauthorised access to sensitive data. Due to a lack of awareness, information, and readiness, people and organisations continue to be vulnerable to social engineering attacks despite breakthroughs in technical security measures. They are susceptible to manipulation and fraud because of this information gap, which puts their security, finances, and privacy at risk (Tripwire, 2023).

The effectiveness and ubiquity of social engineering attacks are largely due to a lack of awareness about social engineering techniques, warning signs, and protective measures. People frequently act in ways that weaken security, accidentally reveal private information, or fail to identify the symptoms of manipulation. As employees inadvertently become the weak links in the security chain, resulting in data breaches, financial loss, and reputational harm, organisations also face major risks.

Additionally, the complexity of social engineering attacks is frequently not fully addressed by the educational tools and awareness campaigns already in place. Numerous of these materials ignore the crucial human factor that social engineering exploits in favour of technical countermeasures. Therefore, a thorough and user-centric approach is urgently needed to increase awareness, improve knowledge, and enable people and

organisations to efficiently recognise, resist, and minimise the risks related to social engineering attacks.

This study intends to investigate and close the knowledge gap by thoroughly analysing social engineering strategies, motivations, and effects on people and organisations in order to address this issue. The research will shed light on the techniques used by social engineers and the weaknesses they prey upon, and it will also examine how to fortify defences, raise security awareness, and promote a security-conscious culture. The study hopes to do this by offering useful advice that people and organisations may use to strengthen their resistance to social engineering attacks and safeguard sensitive data.

1.3 Objectives

The objectives to be achieved on this project are the following:

1. To study the effectiveness of social engineering attacks in terms of user behaviour and decision making by providing real life scenarios in a controlled environment.
2. To develop an interactive and educational system that simulates social engineering attack scenarios to raise awareness of the dangers of social engineering attacks among users.
3. To test and evaluate the effectiveness of the educational system in increasing users' awareness and understanding of social engineering attacks and their ability to recognize and defend against them.

1.4 Scope of Project

These are the scopes of this project:

1. The educational system will focus on various types of social engineering attacks, delivered via email, phone calls, in-person interactions, or social media messages.
2. The educational system will provide comprehensive coverage of social engineering tactics and techniques, including phishing, pretexting, baiting, tailgating, and more. It will include descriptions, examples, and real-world case studies that illustrate the methods employed by attackers.
3. The educational system will be designed to be scalable and adaptable, allowing for the incorporation of new attack scenarios, case studies, and educational materials to reflect emerging trends and evolving social engineering techniques.

1.5 Significance of Project

The significance of this project lies in its potential to educate individuals and organizations about social engineering attacks and how to recognize and defend against them. Currently, cybercrime is carried out by threat actors who may not possess extensive technical expertise in information systems but instead exploit human vulnerabilities (Breda et al., 2017). Through the use of Securify, users can experience real-life social engineering scenarios through interactive quizzes and simulations. This hands-on approach enhances their understanding of the tactics and techniques used by attackers, increasing their awareness and knowledge in a practical and engaging manner. By providing a safe learning environment, Securify helps individuals and organizations develop the skills necessary to identify and mitigate social engineering threats effectively. This project aims to be a valuable resource for educators and trainers in the field of cybersecurity, contributing to the advancement of knowledge and best practices in social engineering awareness and defense.

1.6 Summary

The first chapter, Introduction, provides background information on social engineering in general, as well as the problem statement, objectives, scope, and significance of the project. It also includes a summary of the thesis.

The second chapter, Literature Review, presents an overview of existing systems for simulating social engineering attacks or related topics, and compares these systems to identify their strengths and weaknesses.

The third chapter, Methodology, outlines the system requirements and user requirements for the educational system, as well as the proposed design, interface design, and planning for implementation and testing. It also includes a Gantt chart to illustrate the timeline for these activities.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The literature review chapter aims to provide a comprehensive overview of existing systems designed to educate users about social engineering attacks and related topics. Its primary objective is to compare these systems based on their features, capabilities, and effectiveness to identify gaps and opportunities for improvement in our proposed educational system, Securify.

This chapter will present a detailed summary of each reviewed system, focusing on aspects such as their design, functionality, and target audience. An evaluation of the strengths and weaknesses of each system will be conducted to compare their effectiveness in educating users about social engineering attacks. By analyzing these systems, we aim to gain valuable insights that will inform the design and implementation of Securify.

Through this literature review, we will identify innovative features, instructional methodologies, and engagement strategies employed by existing systems in the field. Additionally, we will consider how these systems address the challenges associated with educating users about social engineering attacks. This assessment will help us identify potential areas of improvement and innovative approaches to enhance the effectiveness of our proposed educational system.

The findings and insights obtained from this literature review will serve as a foundation for the subsequent chapters of our development, ensuring that Securify is designed to address current limitations and make a valuable contribution to the field of social engineering awareness and education.

2.2 Existing System

In this chapter, we will compare our proposed educational website, Securify, with three existing cybersecurity awareness and educational platforms. The purpose of this comparison is to evaluate the features, functionalities, and effectiveness of these platforms in educating users about cybersecurity and social engineering. The three platforms we will be examining are Cybrary, InfoSec Institute, and SecurityIQ.

2.2.1 SecurityIQ



Figure 1 SecurityIQ

SecurityIQ is a cybersecurity awareness and training platform designed for organizations (Cybersecurity Excellence Award, 2023). It offers interactive training modules, simulated phishing attacks, and assessments to educate employees about cybersecurity best practices. SecurityIQ focuses on creating a culture of security awareness within organizations and provides analytics to track user engagement and progress. You can compare Securify with SecurityIQ in terms of the effectiveness of training delivery, the engagement level of the educational content, and the ability to customize training programs for different user groups.

2.2.2 Infosec Institute



Figure 2 Infosec Institute

InfoSec Institute is an online platform that offers cybersecurity training, certifications, and resources (Infosec, 2020). It provides various courses covering different cybersecurity domains, including social engineering, penetration testing, and incident response. InfoSec Institute emphasizes hands-on training and offers virtual labs and practical exercises. You can compare Securify with InfoSec Institute based on the practicality and real-world relevance of the training, the availability of interactive exercises, and the credibility of certifications offered.

2.2.3 Cybrary



Figure 3 Cybrary

Cybrary is an online learning platform that offers a wide range of cybersecurity courses and resources (Cybrary, 2023). It provides both free and paid options, allowing users to access educational materials, video tutorials, and hands-on labs. Cybrary focuses on practical learning and offers certifications to validate cybersecurity skills. It can be compared with Securify in terms of the breadth and depth of cybersecurity content, interactive learning experiences, and the ability to earn certifications.

2.3 Comparison of Existing System

In this subchapter, we compare the features and elements of the three existing cybersecurity awareness platforms with Securify.

Table 1 Comparison of Existing System

Features	Cybrary	Infosec Institute	SecurityIQ	Securify
Type	Online platform	Online platform	Online platform	Online platform
Primary Focus	General audience	General audience	Organizations	Locals in Malaysia
Training Materials	Yes	Yes	Yes	Yes
Analytics and Reporting	Limited	Yes	Yes	Yes
Quizzes	Yes	Yes	Yes	Yes
Educational Materials	Yes	Yes	Yes	Yes
Live News	No	No	No	Yes

The comparison table provides an overview of the key elements between three existing cybersecurity awareness platforms, Cybrary, InfoSec Institute, and SecurityIQ, and our proposed educational website, Securify. Each platform falls under the category of an online platform, offering training and educational materials to users.

In terms of the primary focus, Cybrary, InfoSec Institute, and SecurityIQ target a general audience or organizations, while Securify stands out by specifically catering to locals in Malaysia. This localized approach allows Securify to address the specific cybersecurity education needs of the Malaysian community.

When it comes to training materials, all platforms offer resources to enhance users' cybersecurity knowledge. Quizzes are also available on each platform as a means

of assessing users' understanding. This interactive feature allows users to test their comprehension and reinforce their learning.

Analytics and reporting capabilities are provided by InfoSec Institute, SecurityIQ, and Securify. These features enable users to track their progress, measure the effectiveness of the educational materials, and identify areas for improvement.

Furthermore, all platforms offer educational materials to supplement users' cybersecurity education. These materials may include articles, guides, videos, and other resources covering various cybersecurity topics.

What sets Securify apart is the inclusion of live news updates related to cybersecurity. This unique feature ensures that users have access to the latest trends, threats, and developments in the field. By staying informed through live news updates, users can stay ahead of emerging cybersecurity challenges and make informed decisions regarding their online security.

In summary, while all the platforms provide valuable training materials and quizzes, Securify's focus on the local Malaysian audience, inclusion of live news updates, and comprehensive educational materials contribute to its distinctiveness as an educational and awareness platform.

2.4 Summary

This chapter presented a comparison between three existing cybersecurity awareness platforms, Cybrary, InfoSec Institute, and SecurityIQ, and our proposed educational website, Securify. The comparison focused on elements such as the type of product, primary focus, training materials, analytics and reporting, quizzes, educational materials (blog), and live news updates. While all platforms offer valuable training resources, Securify stands out by specifically targeting the local Malaysian audience, providing live news updates, and offering comprehensive educational materials. These distinctive features position Securify as an effective and localized cybersecurity educational platform.

CHAPTER 3

METHODOLOGY

3.1 Introduction

In the previous chapter, we conducted a literature review to identify the strengths and weaknesses of existing systems for educating users about social engineering attacks. Building upon the findings, this chapter presents the methodology employed in the development of our educational system, Securify. The focus is on detailing the steps, techniques, and tools used to design and build a high-quality, user-friendly platform that raises awareness about security and social engineering.

The methodology described in this chapter follows a systematic approach, encompassing the planning, design, implementation, and evaluation phases of the Securify website. User-centered design principles and industry best practices will be leveraged to ensure an intuitive and engaging user experience. The selection and organization of educational materials will be guided by the outcomes of the literature review to provide relevant and up-to-date information.

Additionally, the methodology incorporates the use of appropriate tools and technologies to enhance the website's functionality and performance. These tools may include content management systems, front-end frameworks, and secure hosting environments. The choice of tools will be based on their suitability for the project requirements and compatibility with the desired features of Securify.

By adhering to this methodology, we aim to create an effective educational system that addresses the gaps identified in existing systems and empowers users to recognize and defend against social engineering attacks. The methodology outlined in this chapter serves as a roadmap for the development process, ensuring the successful implementation of Securify.

3.2 Waterfall Model

The Waterfall model is a linear and sequential approach to the software development life cycle (SDLC) that follows a rigid and structured process where each phase must be completed before the next one begins (Conrad, 2011). It is a traditional methodology that is used for projects where the requirements are well-defined and unlikely to change.

Waterfall model is chosen as the development methodology because it is a simple and straightforward approach that is easy to understand and implement. Furthermore, it still remains the most popular model used in the software engineering field (Adenowo & Adenowo, 2020). Additionally, the Waterfall model is well-suited for educational purposes as it provides a clear and systematic process for students to follow, which will make it easier for them to understand the software development process. Some benefits of the Waterfall model include:

- It allows for clear and concise communication between the development team and stakeholders (Bucăța & Rizescu, 2017).
- It provides a clear and measurable process that can be used to track progress and identify any issues.
- It is well-suited for projects where the requirements are well-defined and unlikely to change.
- It provides a clear and systematic process for students to follow, which will make it easier for them to understand the software development process.

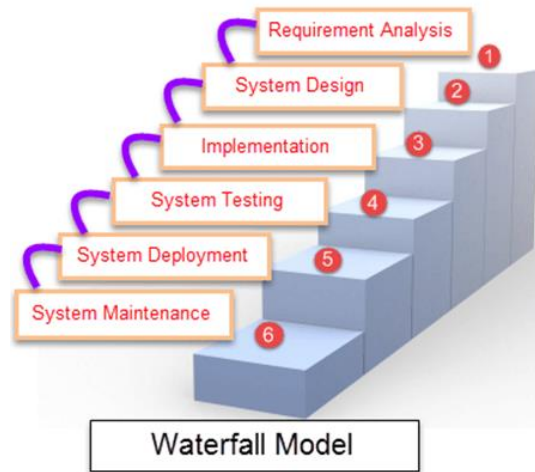


Figure 4 Waterfall Model

The figure above shows the phases of the Waterfall software development lifecycle (Sinha & Das, 2021).

3.2.1 Requirement Analysis

In this phase, the project requirements are gathered and analyzed to define the scope of the project. This includes identifying the goals and objectives of Securify, as well as any constraints or limitations. The requirements are documented in a requirements specification document.

3.2.2 System Design

In this phase, the system and software design are developed based on the requirements gathered in the first phase. This includes creating diagrams and models to visualize the system, as well as specifying the hardware and software components that will be used. The design is documented in a design specification document.

3.2.3 Implementation

During the implementation phase of the Securify project, we utilize FilamentPHP as our chosen tech stack. FilamentPHP is a comprehensive set of tools specifically

designed to facilitate the rapid development of visually appealing TALL stack applications. TALL stands for:

Table 2 TALL Stack Description

Framework/ Library	Description
Tailwind CSS	A highly customizable and utility-first CSS framework for efficient UI styling and design.
Alpine.JS	A lightweight JavaScript framework for building interactive user interfaces with minimal overhead.
Laravel	A powerful PHP framework that follows the MVC architectural pattern for scalable web application development.
Livewire	A full-stack framework enabling dynamic and interactive web interfaces using server-side rendering techniques.

On the other hand, here is a table outlining the software tools used to develop Securify, along with their respective purposes:

Table 3 Software Tools Used to Develop Securify

Framework/ Library	Purpose
VS Code	An integrated development environment (IDE) used for writing and editing code, providing features like syntax highlighting, code suggestions, and debugging capabilities.
XAMPP	A cross-platform software package that provides a local development environment for creating and testing web applications. It includes Apache as a web server, MySQL as a database server, and PHP for server-side scripting, making it suitable for PHP-based projects like Securify.
Sourcetree	A graphical user interface (GUI) for managing version control systems, specifically Git. It allows for easy tracking of changes, branching, and merging on the project.

The table below shows the hardware that are used to develop Securify:

Table 4 Hardware Used to Develop Securify

Framework/ Library	Purpose
PC	The main development machine used for coding, testing, and running the application.
LAN Adapter	A network adapter used to connect the development machine to the local area network.
External Hard Drive	An additional storage device used for backing up project files and transferring data.

3.2.4 Testing

In this phase, the system is tested to ensure that it meets the requirements and is free of errors. This includes conducting different types of testing such as unit testing, integration testing, and acceptance testing.

3.2.5 Deployment

In this phase, the system is deployed and made available to the end-users. This includes installing the software on the target machines, configuring the system, and training the users.

3.2.6 Maintenance

In this phase, the system is maintained, and any issues or bugs are fixed. This includes addressing any problems that may arise after the system has been deployed, as well as making any necessary modifications or updates to the system.

3.3 Gantt Chart

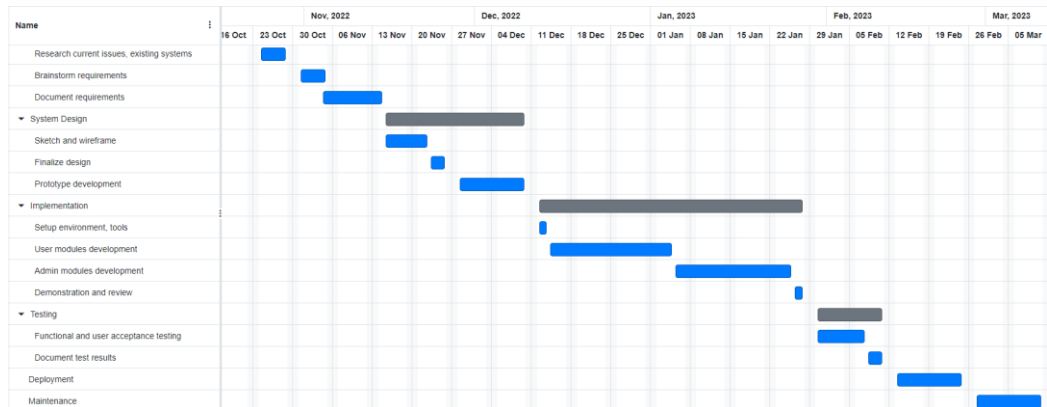


Figure 5 Gantt Chart

The figure above shows the Gantt chart of this project. In the context of a project using the Waterfall model, a Gantt chart would typically be used to show the progression of the different phases of the project, such as requirements gathering, design, development, testing, and deployment. Each phase would be represented by a horizontal bar that spans the duration of the phase, and the bars would be arranged in chronological order from left to right.

3.4 Project Requirements

3.4.1 Functional Requirements

- i. The system should allow the users and administrator to login and register.
- ii. The system should allow the users to answer quizzes.
- iii. The system should allow the user to revise their quiz answers.
- iv. The system should allow the users to read live social engineering news.
- v. The system should allow the users to read social engineering blogs.
- vi. The system should allow the administrator to manage quizzes.
- vii. The system should allow the administrator to manage news.
- viii. The system should allow the administrator to manage blogs.
- ix. The system should allow the administrator to manage topics.
- x. The system should allow the administrator to manage questions.
- xi. The system should allow the administrator to manage roles.
- xii. The system should allow the administrator to manage users.

3.4.2 Non-functional Requirements

- i. The system should be able to handle a large number of concurrent users and provide fast response times.
- ii. The system should be able to easily scale to accommodate future growth in the number of users.
- iii. The system should protect user data and prevent unauthorized access by using robust security features such as encryption and user authentication.
- iv. The system should be easy to use and navigate for users of all skill levels.
- v. The system should have a high uptime and be available for use at all times.

3.4.3 Constraint and Limitation

- i. **Time constraint:** This refers to the limitation imposed on the project schedule. It means that there is a specific timeline or deadline within which the development of Securify must be completed. Time constraints can affect various aspects of the project, including the development process, testing, and deployment. It requires efficient time management, prioritization, and adherence to project milestones to ensure timely delivery.
- ii. **Technical constraint:** Technical constraints refer to limitations or restrictions imposed by the chosen technology stack, hardware, software, or development environment. These constraints could arise from compatibility issues, hardware limitations, software dependencies, or specific requirements of the chosen tools or frameworks. It is important to identify and address these constraints early on to ensure smooth development and prevent potential bottlenecks or incompatibilities.
- iii. **Budget constraint:** Budget constraints involve limitations on the financial resources available for the development of Securify. This constraint encompasses factors such as funding availability, cost of acquiring software licenses, hardware expenses, infrastructure costs, and other project-related expenses. It requires careful budget planning and resource allocation to ensure that the development stays within the allocated budget and any financial limitations are taken into account throughout the project lifecycle.

3.5 Proposed Design

3.5.1 Context Diagram

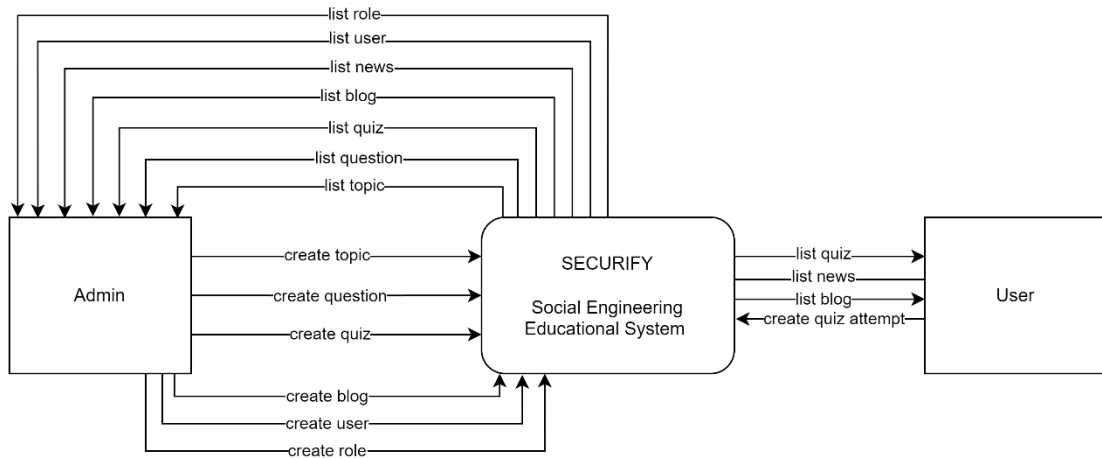


Figure 6 Context Diagram

The context diagram for Securify illustrates the primary entities involved in the system, namely the user and the administrator. Firstly, the administrator can create questions for a topic to be attached under a quiz. The system will then return the list of topics, questions, and quiz for the administrator to update or delete. The administrator can also create blogs for user to read. On the other hand, the user can attempt to answer the quiz created by the administrator earlier. Securify will also fetches live news related to the social engineering topic and display it to the user and administrator.

3.5.2 Use Case Diagram

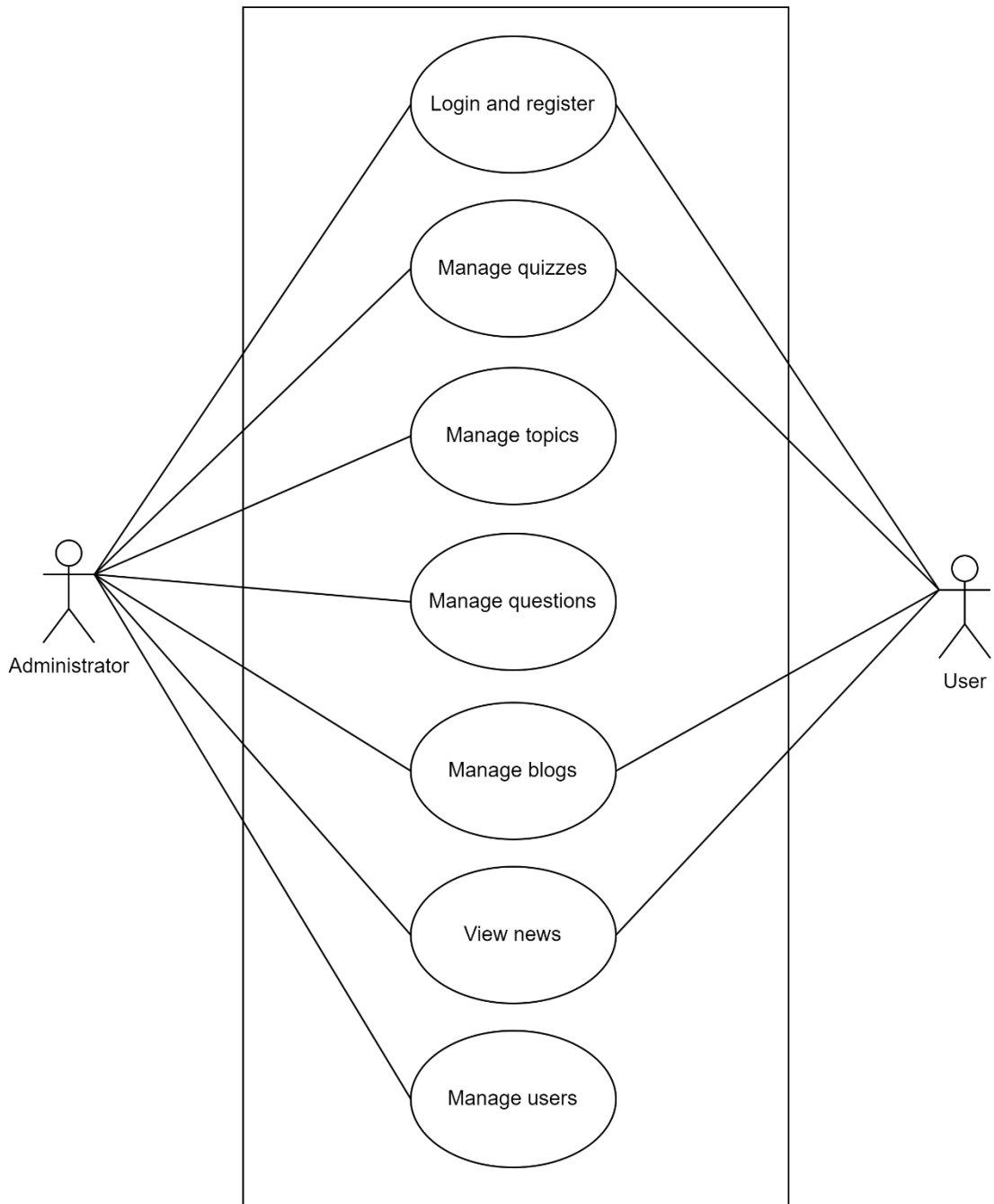


Figure 7 Use Case Diagram

The use case diagram for Securify illustrates the key interactions and functionalities available within the system. Users can log in or register to access the

educational content and features. The system allows users to manage quizzes, including creating, editing, and deleting quizzes that present social engineering scenarios. Users can also organize the content by creating, updating, and deleting topics or categories related to social engineering. Additionally, users have the ability to manage individual questions used within the quizzes, enabling them to create, edit, and delete question content, options, and correct answers.

Securify also provides a platform for users to create, edit, and delete blog posts about social engineering, contributing additional educational content and insights. In order to keep users informed about the latest scams and social engineering incidents, the system fetches live scam news using the NewsData API, allowing users to view up-to-date information. Administrators have the ability to manage user accounts, including tasks such as adding new users, editing user details, and managing user roles and permissions within the system.

The use case diagram provides a clear visual representation of these interactions and functionalities, helping to understand how users and the system interact with each other. It serves as a valuable tool for designing and developing the Securify system, ensuring that the necessary features are identified and implemented to fulfill the users' needs and requirements.

3.5.3 Flowchart

Table 5 Flowchart for User

Process	Action	Responsibility
<pre> graph TD Start([Start]) --> 1[1] 1 --> Account{Have account?} Account -- No --> 2[2] 2 --> 1 Account -- Yes --> 3[3] 3 --> Answer{Finish answer?} Answer -- No --> 3 Answer -- Yes --> 4[4] 4 --> End([End]) </pre>	<ol style="list-style-type: none"> 1. Login into the system Does the user have an account? 2. Register as a user. 3. Access social engineering quizzes. Finish answer? 4. View performance. 	<ol style="list-style-type: none"> 1. User 2. User 3. User 4. User

Table 6 Flowchart for Administrator

Process	Action	Responsibility
<pre> graph TD Start([Start]) --> 1[1] 1 --> 2[2] 2 --> 3[3] 3 --> 4[4] 4 --> Publish{Publish?} Publish -- No --> 3 Publish -- Yes --> 5[5] 5 --> End([End]) </pre>	<ol style="list-style-type: none"> 1. Login into the system 2. Create topic. 3. Create question. 4. Create answer. <p>Publish topic?</p> <ol style="list-style-type: none"> 5. View topic. 	<ol style="list-style-type: none"> 1. Administrator 2. Administrator 3. Administrator 4. Administrator

3.5.4 Activity Diagram

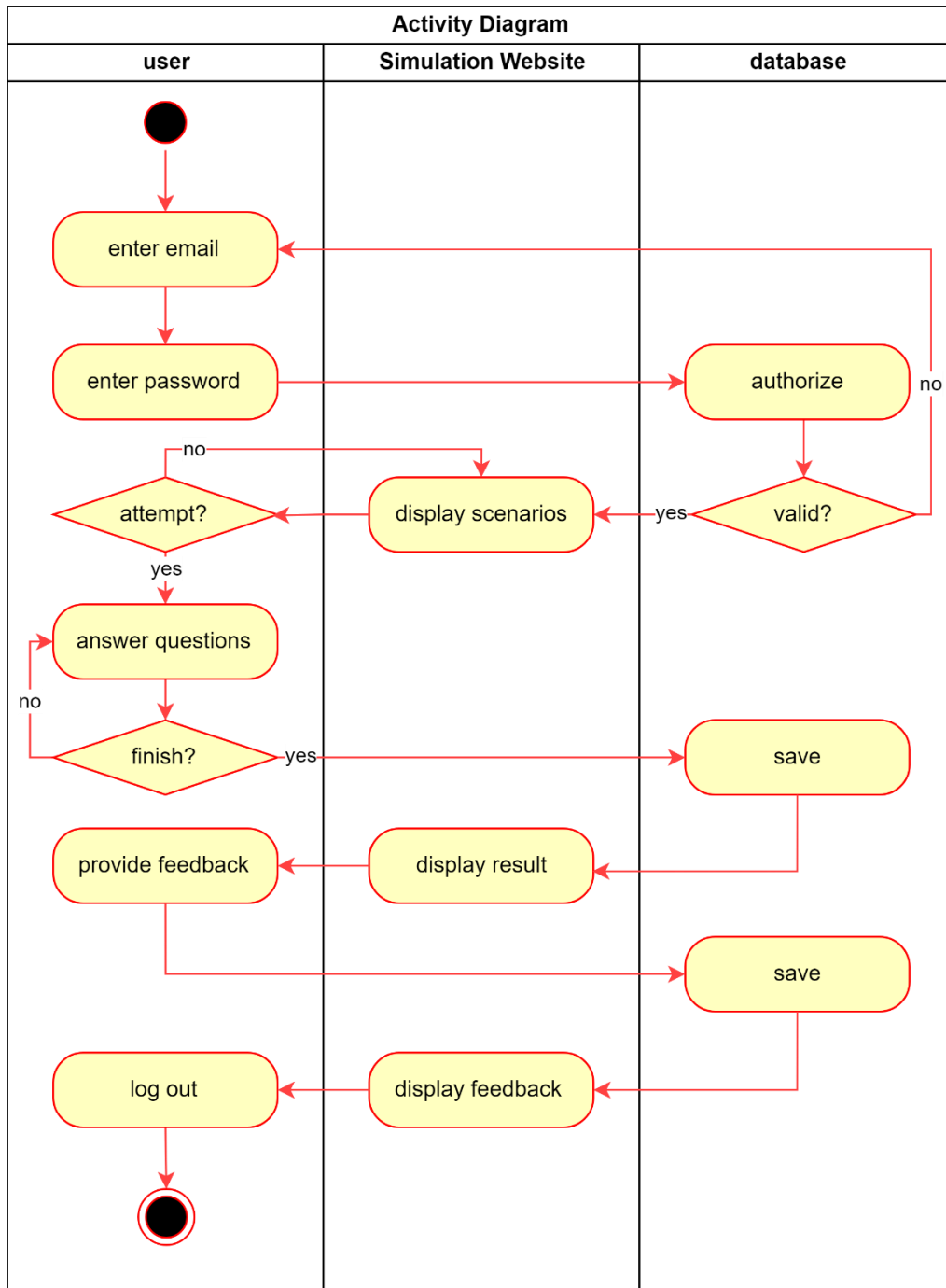


Figure 8 Activity Diagram for User

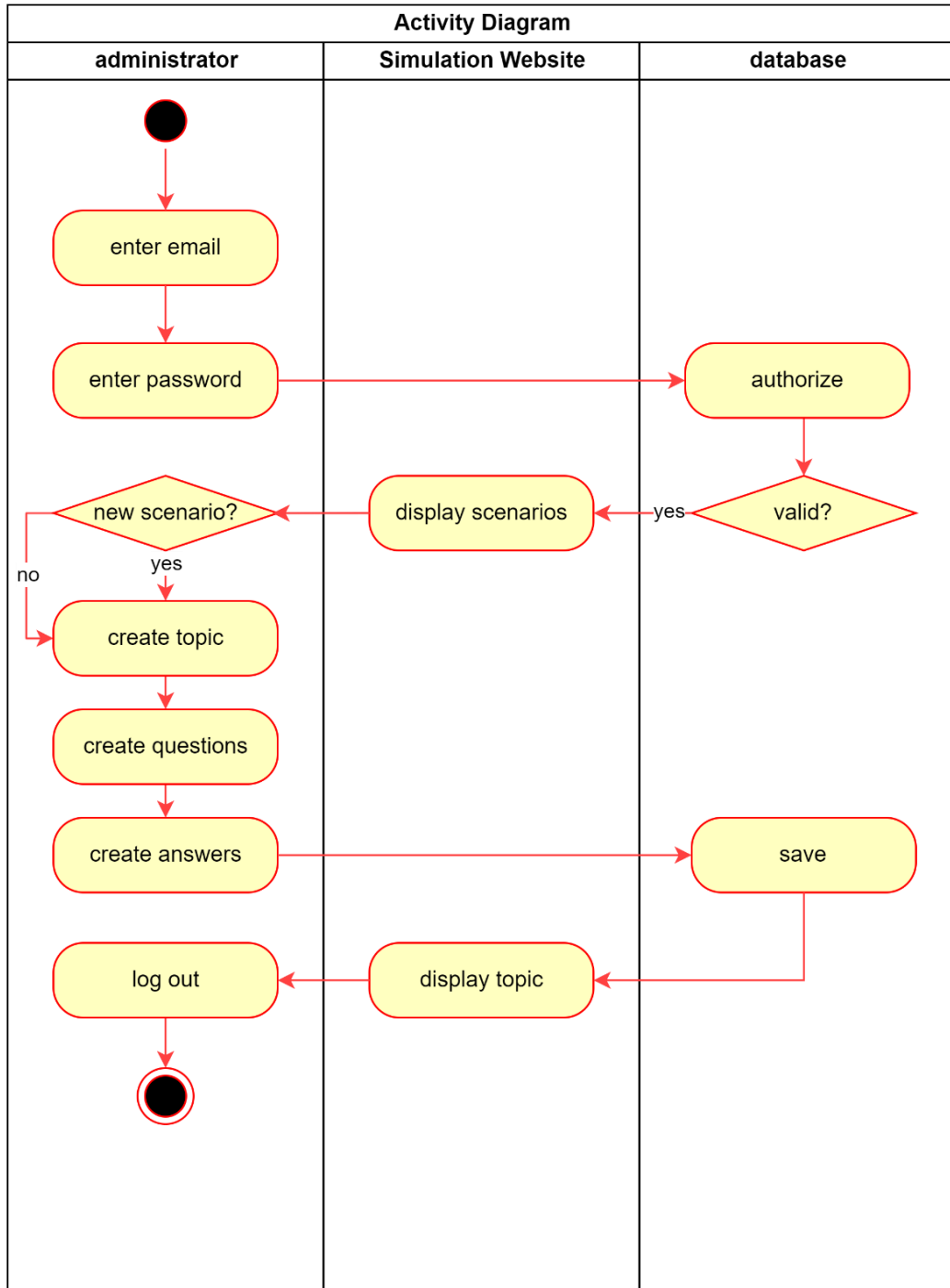


Figure 9 Activity Diagram for Administator

3.6 Data Design

3.6.1 Entity Relationship Diagram

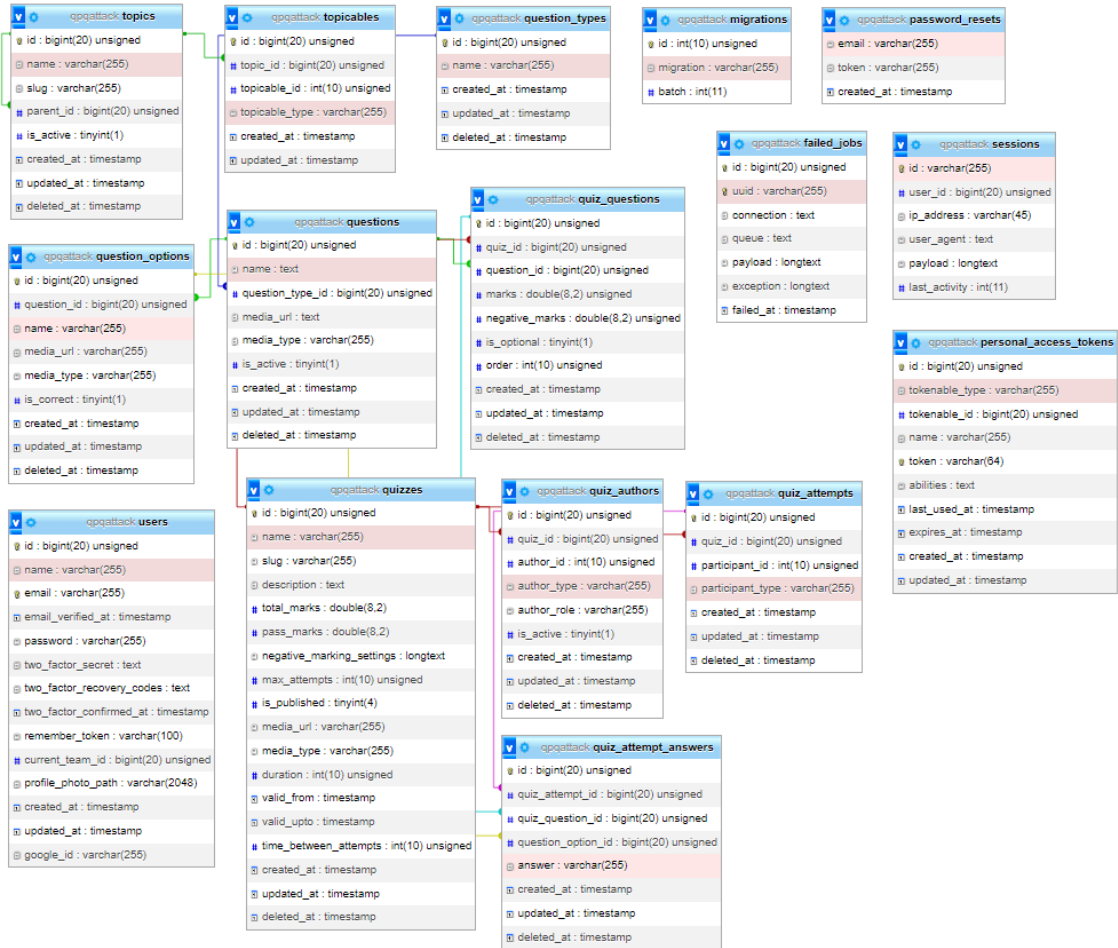


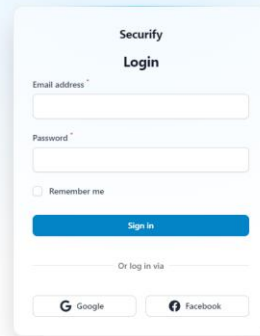
Figure 10 Entity Relationship Diagram

3.6.2 Data Dictionary

The data dictionary of Securify is attached on Appendix B.

3.7 Proof of Initial Concept

3.7.1 Login



The image shows a login form titled "Security Login". It features two input fields: "Email address" and "Password". Below these fields is a checkbox labeled "Remember me". A blue "Sign in" button is positioned below the checkbox. Underneath the button, there is a line of text that reads "Or log in via". At the bottom of the form, there are two buttons for social login: "Google" and "Facebook".

Figure 11 login page

3.7.2 Administrator Dashboard

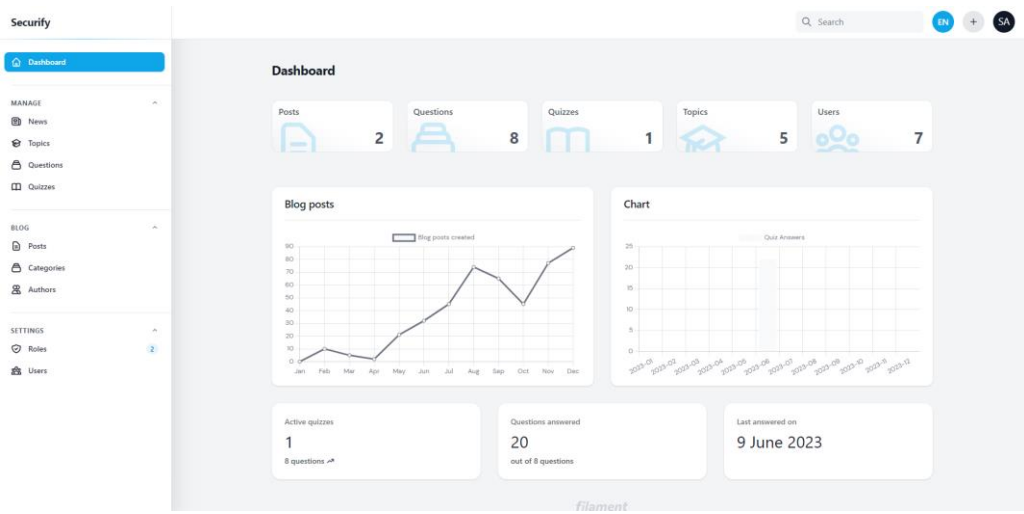


Figure 12 Administrator dashboard page

3.7.3 View News

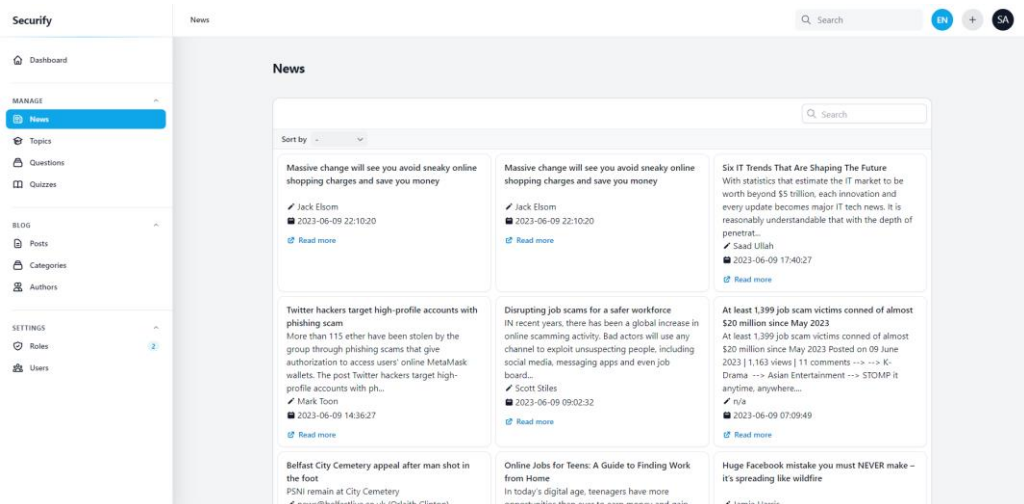


Figure 13 View list of live news

3.7.4 Manage Question

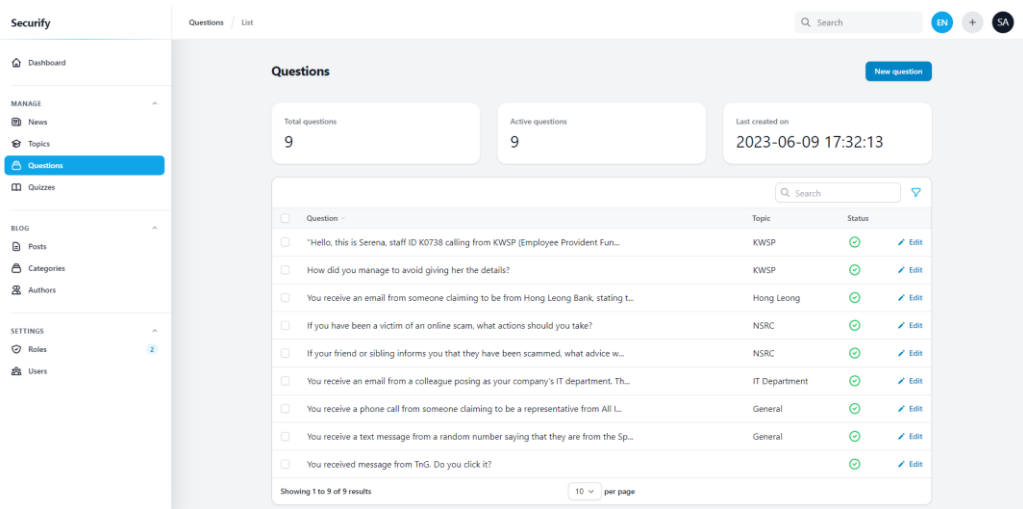


Figure 14 View list of questions

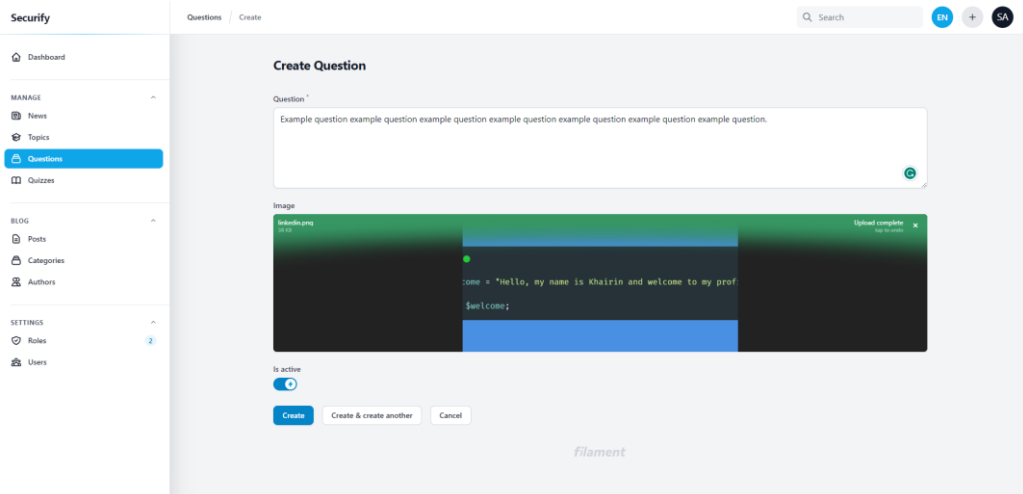


Figure 15 Create question

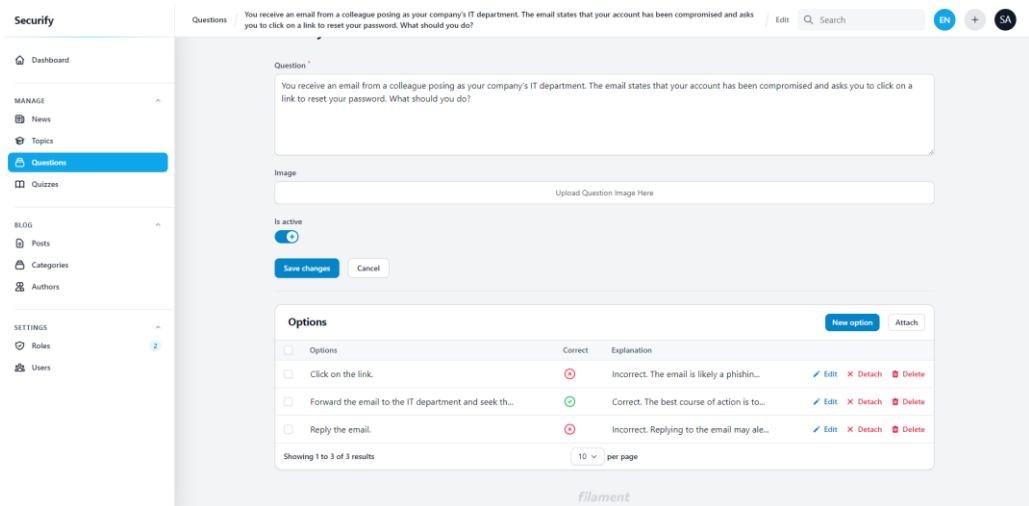


Figure 16 Create answers for question

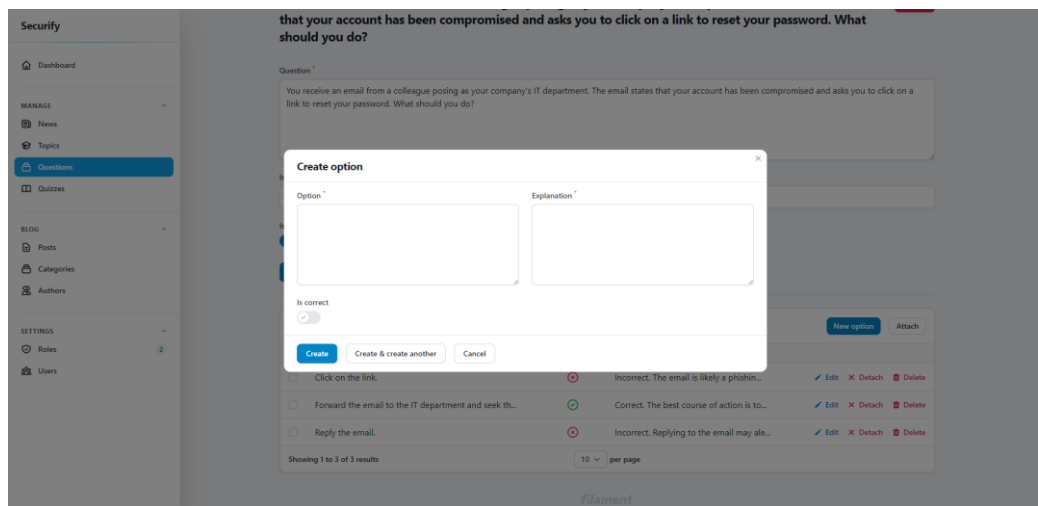


Figure 17 Enter answer details

3.7.5 Manage Topic

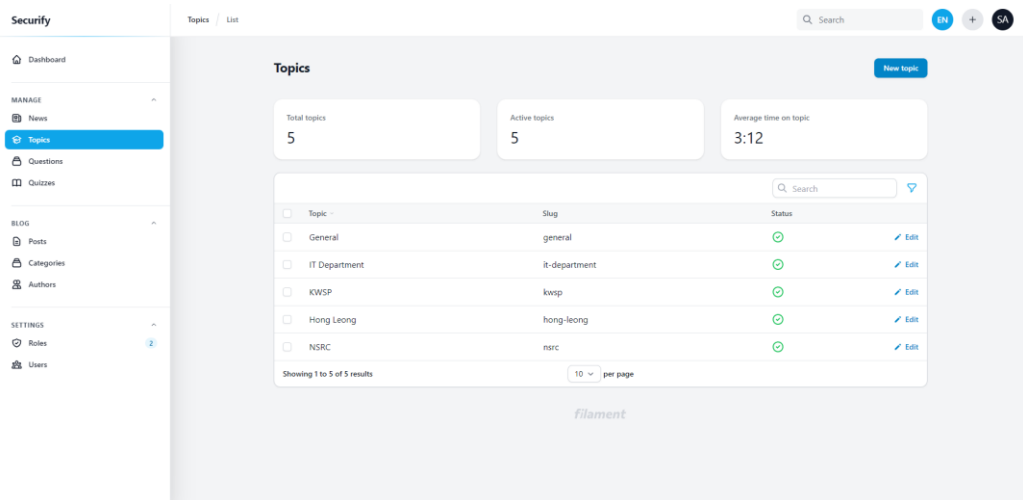


Figure 18 View list of topics page

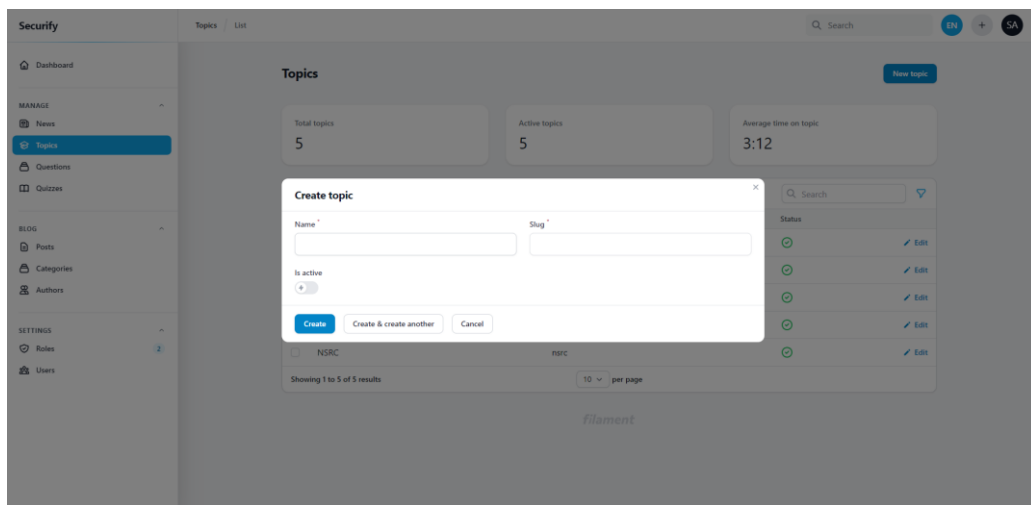


Figure 19 Create topic

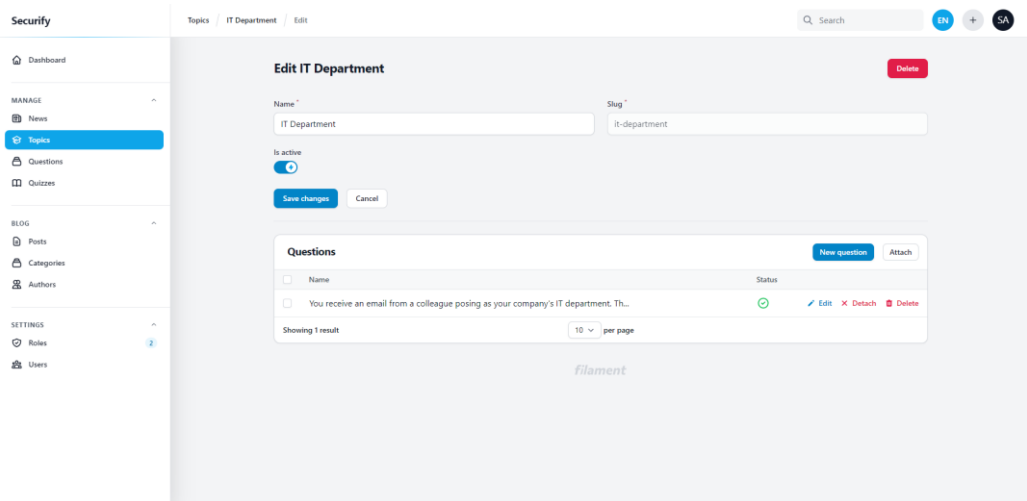


Figure 20 Create question for topic

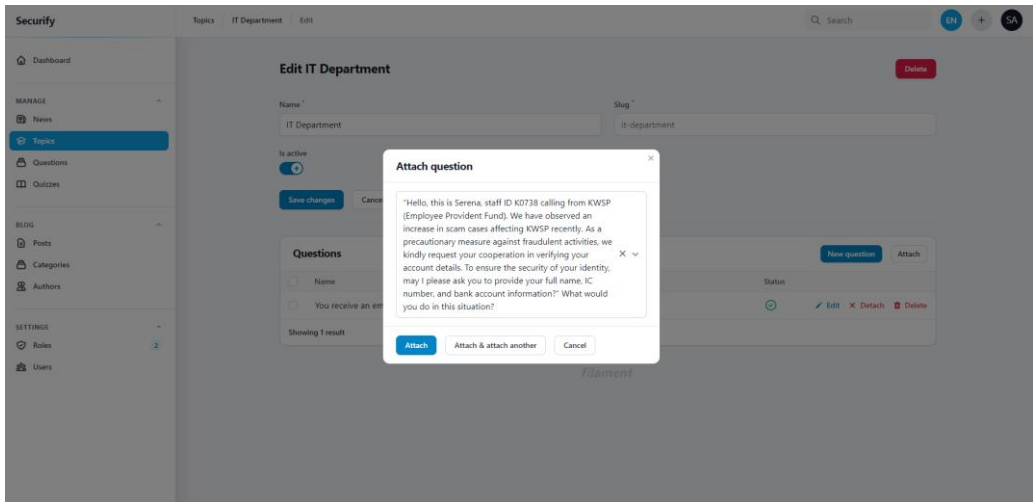


Figure 21 Attach question to topic

3.7.6 Manage Quiz

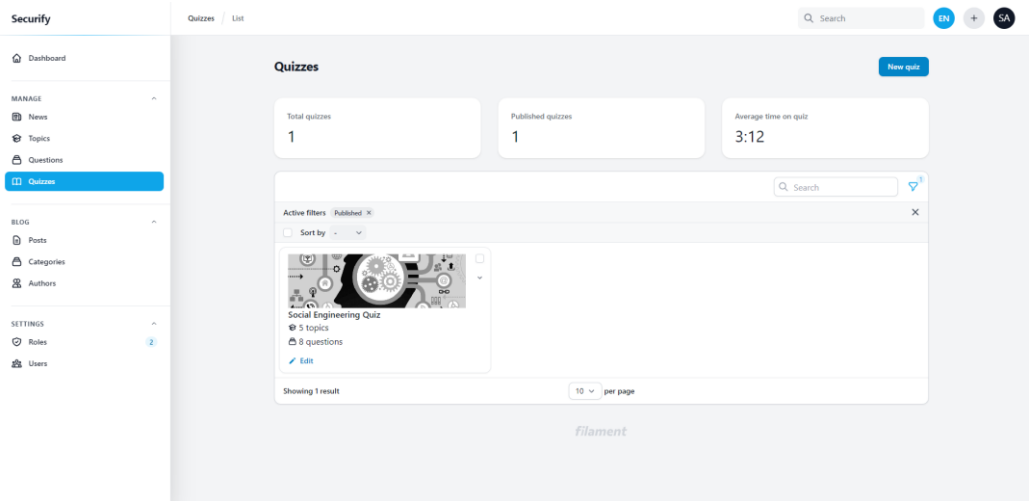


Figure 22 View list of quizzes

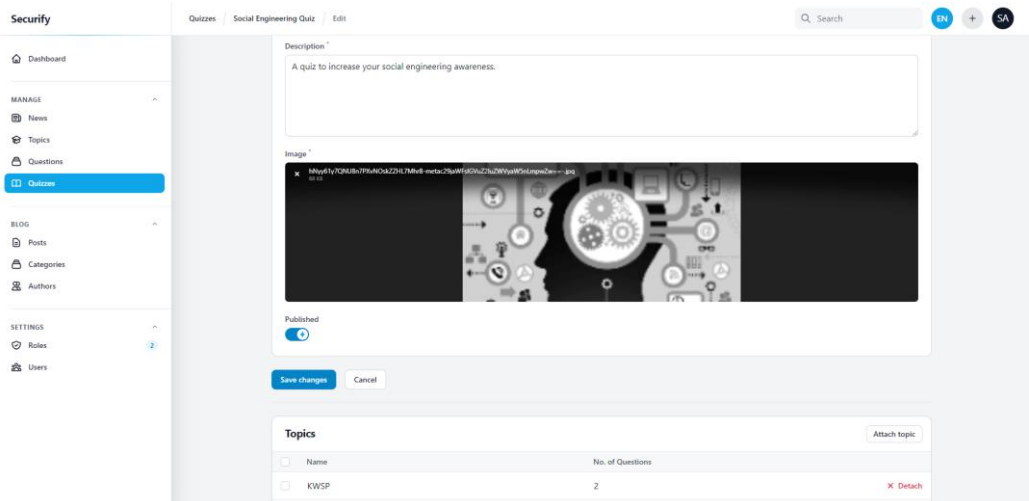


Figure 23 View and edit quiz details

3.7.7 Manage Blog

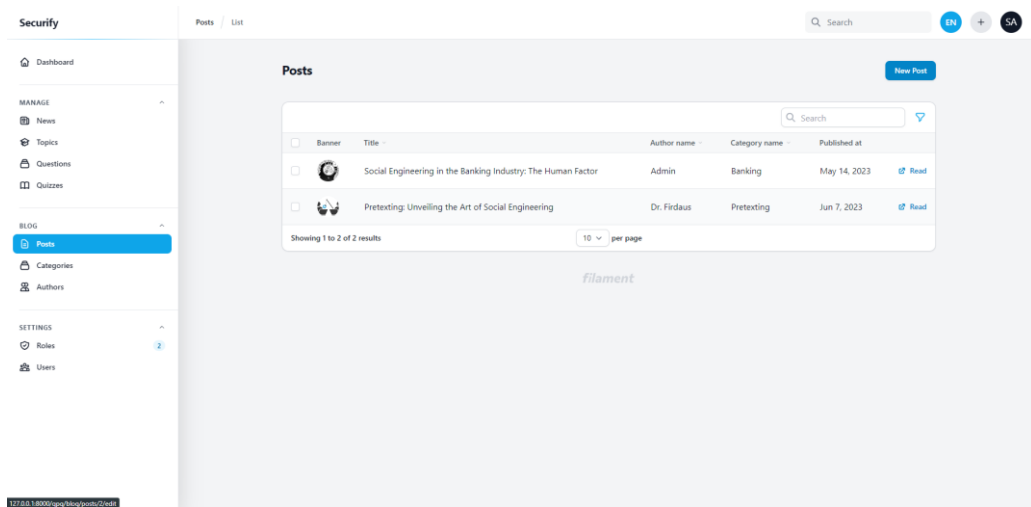


Figure 24 View list of blogs

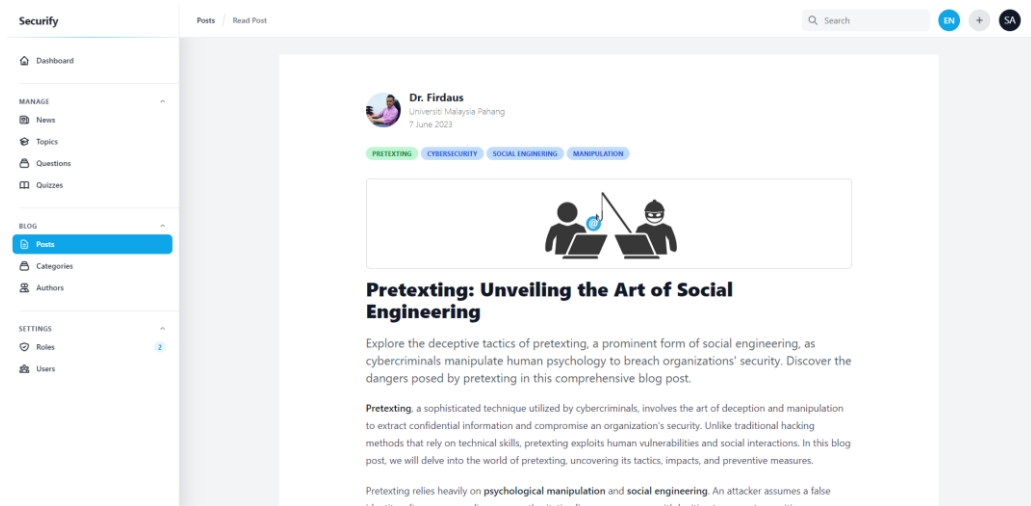


Figure 25 Read blog

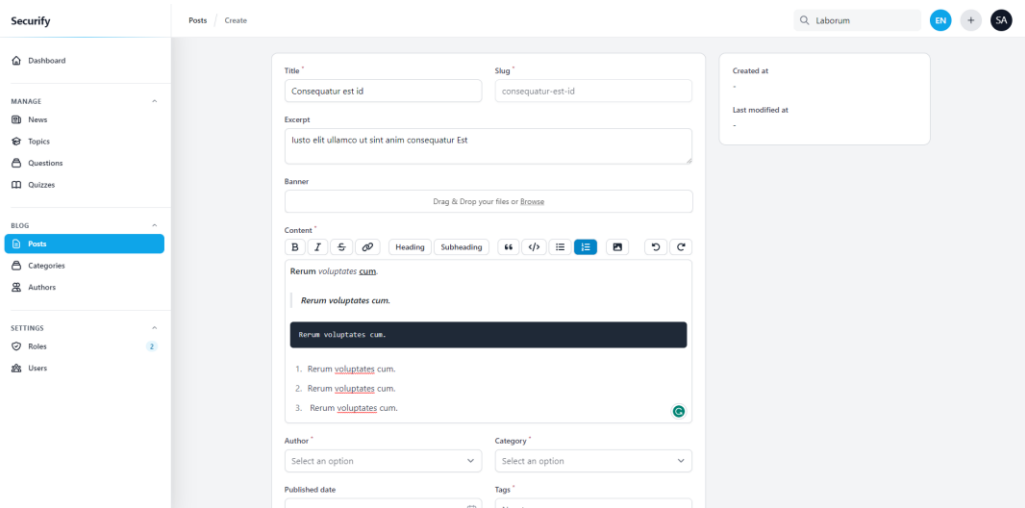


Figure 26 Create blog

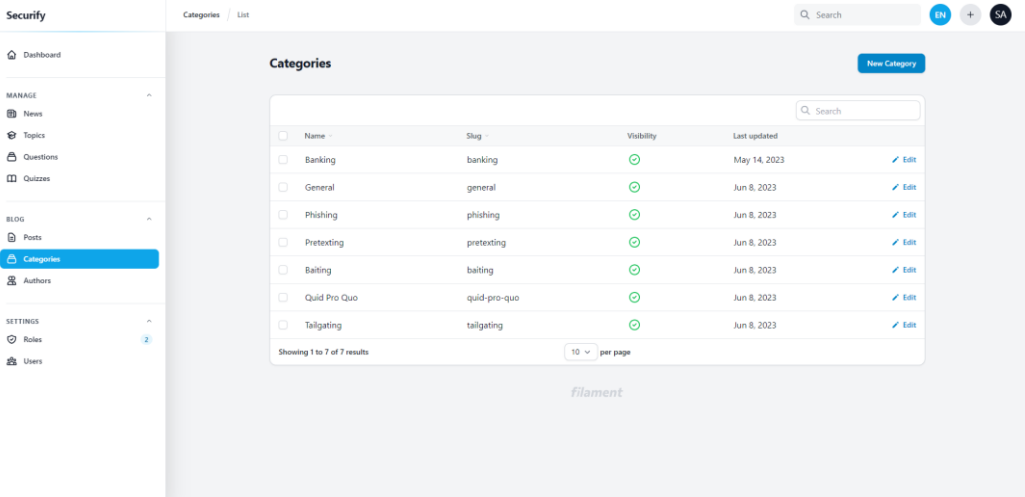


Figure 27 View list of categories

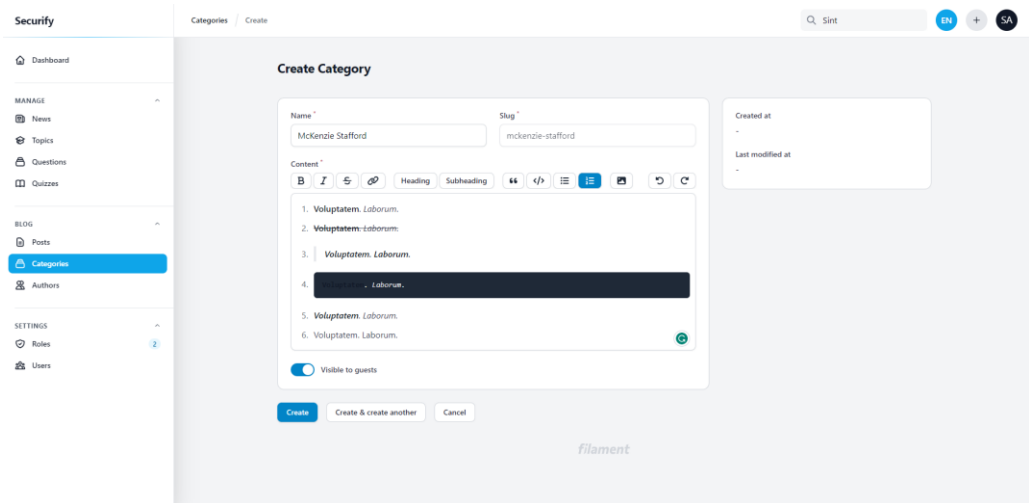


Figure 28 Create category

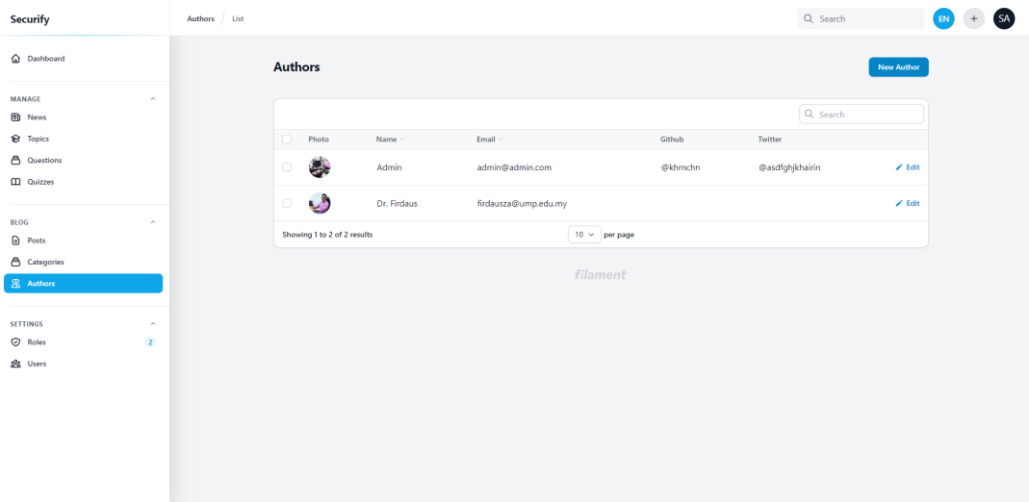


Figure 29 View list of authors

3.7.8 Manage User

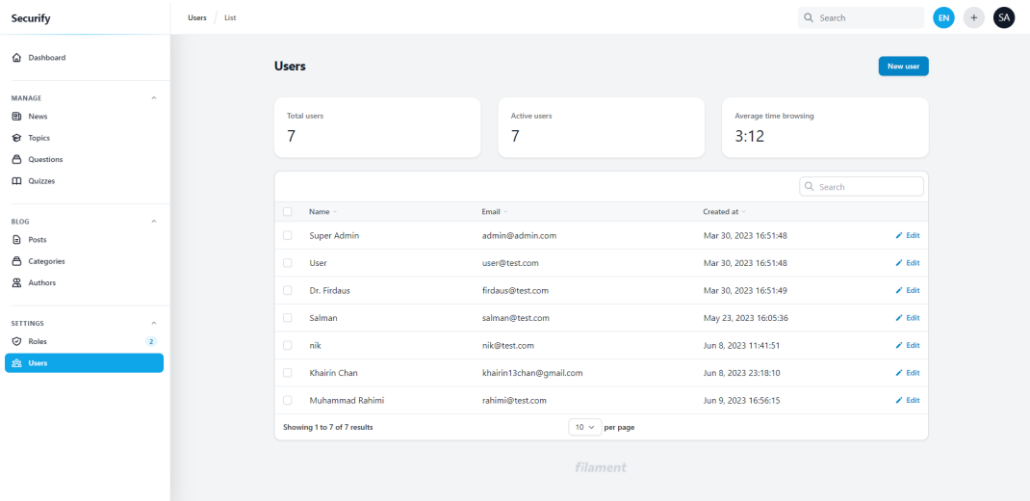


Figure 30 View list of users

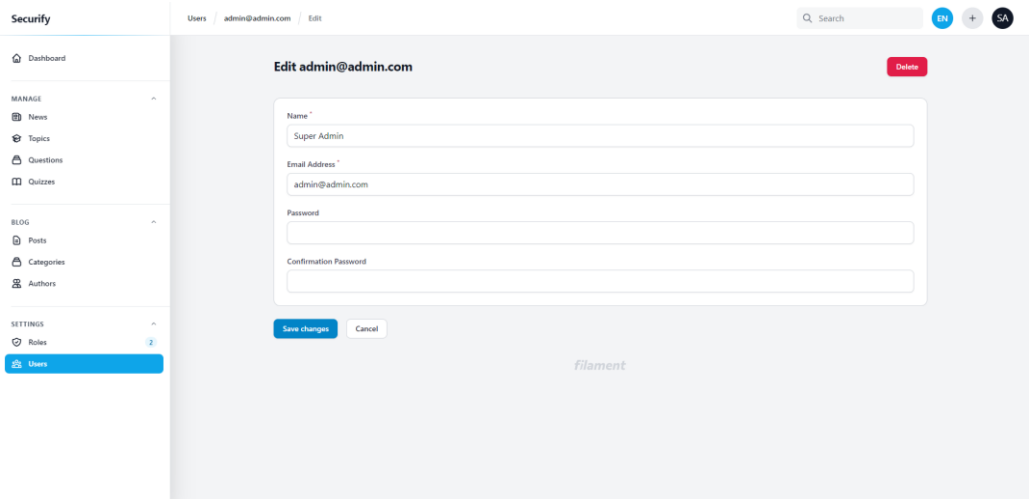


Figure 31 View and edit user details

3.7.9 Manage Roles

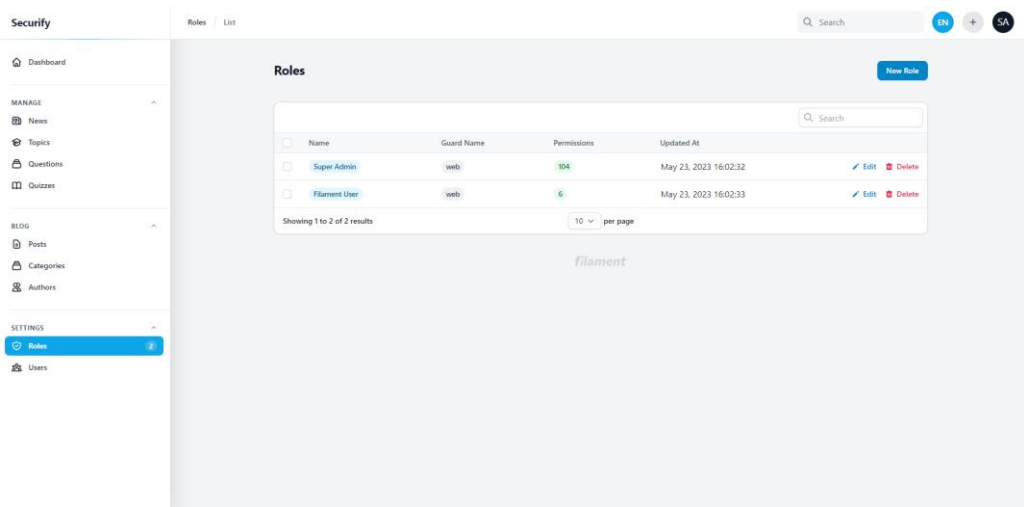


Figure 32 View list of roles

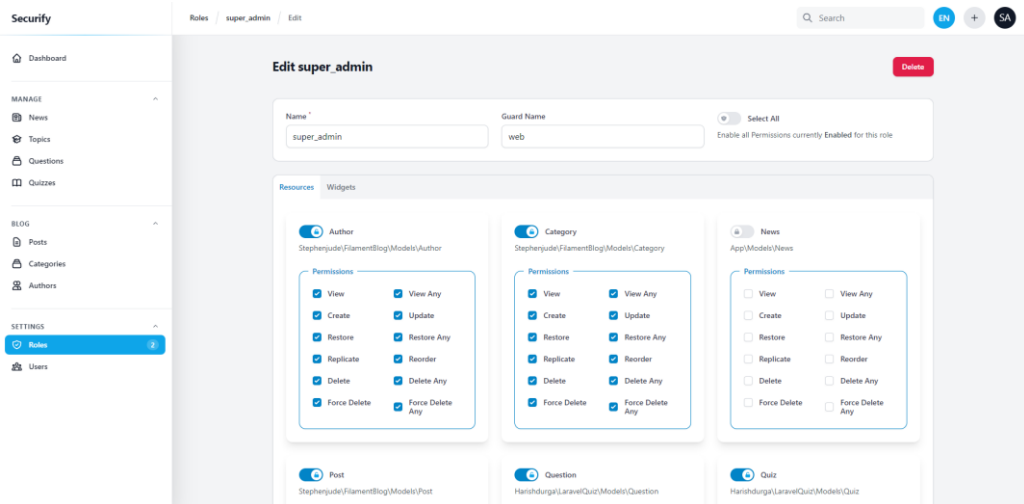


Figure 33 View and edit roles

3.7.10 User Dashboard

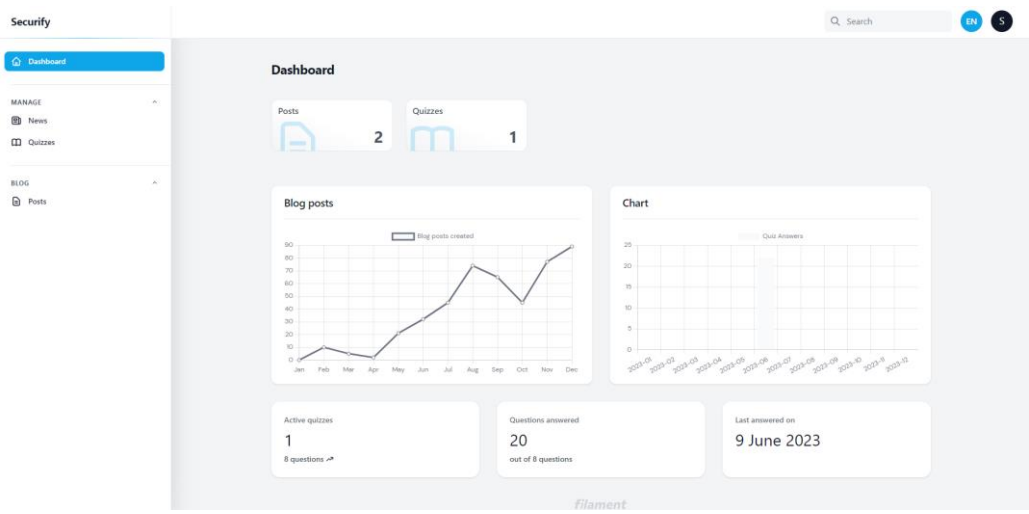


Figure 34 User login

3.7.11 View News

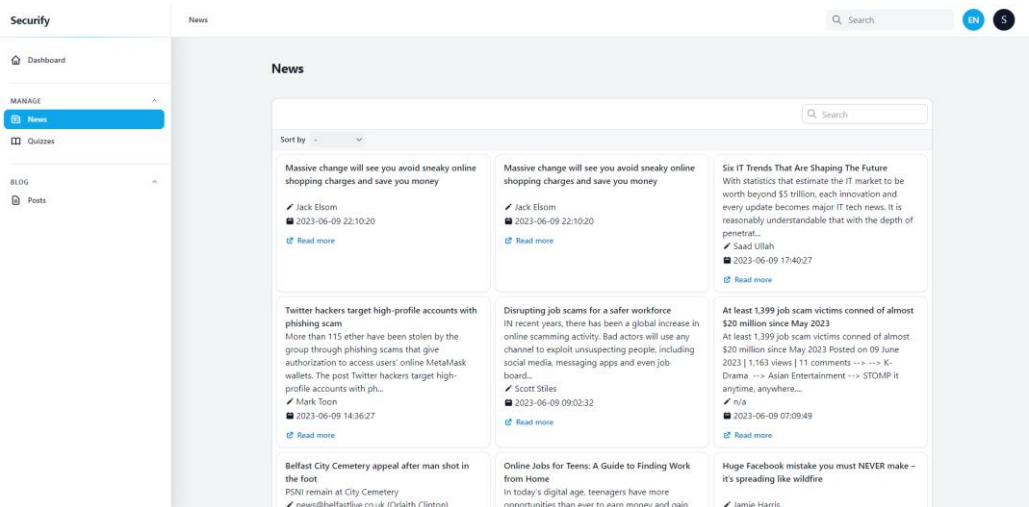


Figure 35 User dashboard

3.7.12 Quizzes

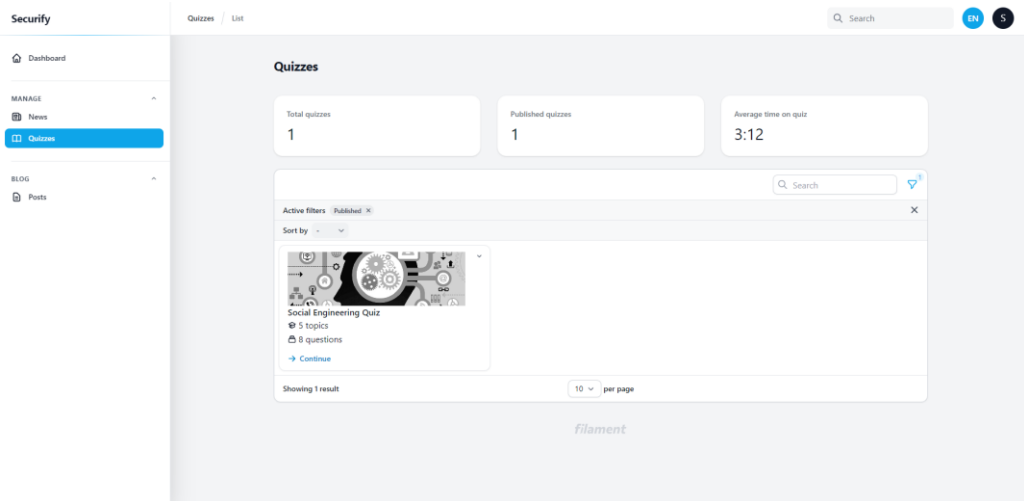


Figure 36 Quizzes

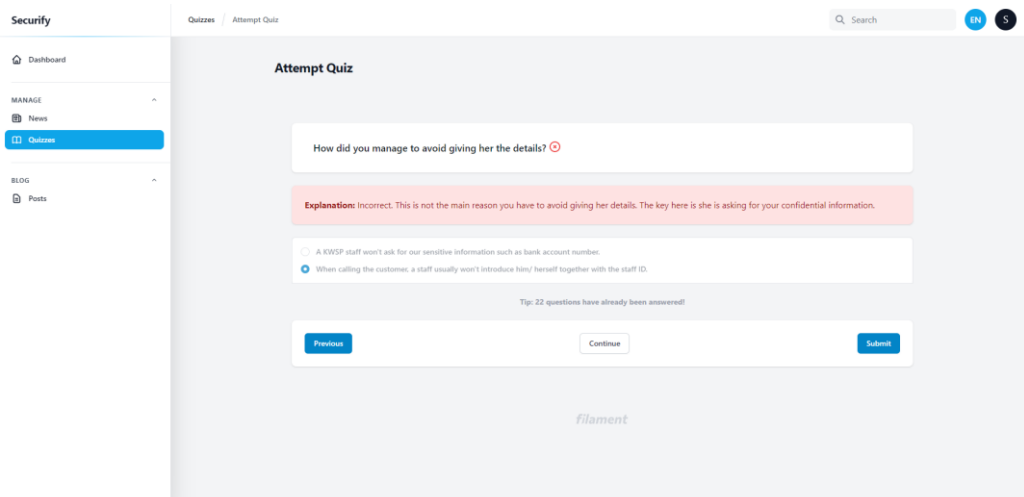


Figure 37 Attempt quiz

3.7.13 Blogs

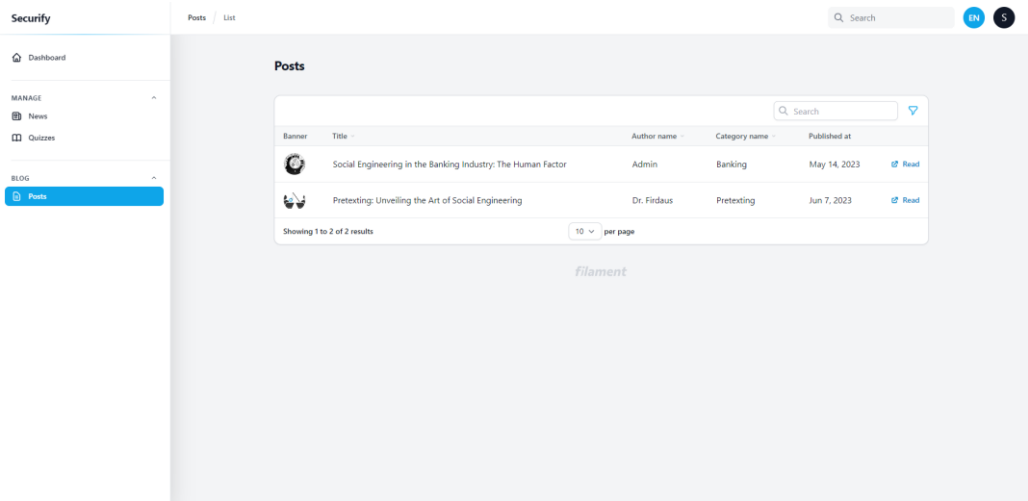


Figure 38 View list of blogs

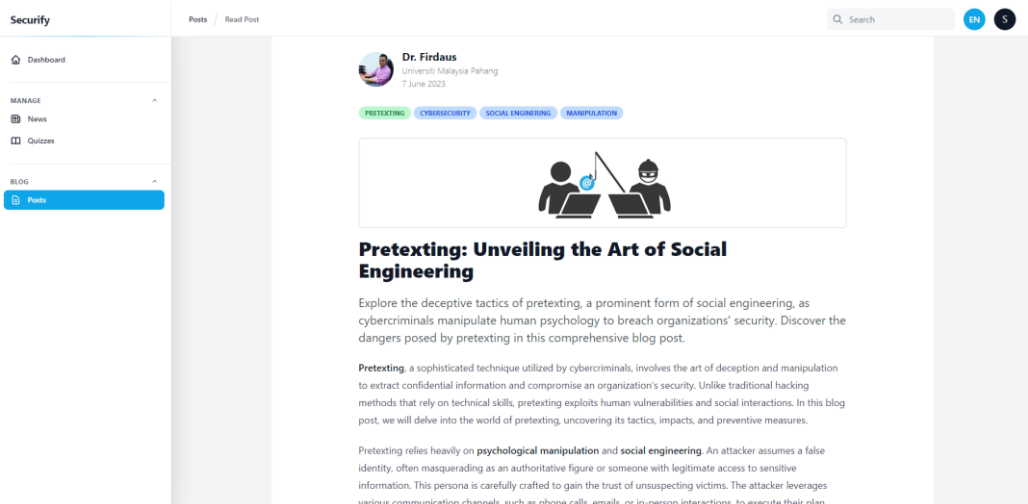


Figure 39 Read blog

3.8 Testing Plan

A validation and testing plan for Securify would be the two types of testing plans which are User Acceptance Test and Usability Test (“12 Usability Testing Templates/Examples [+Checklist] | Hotjar,” 2022).

3.8.1 User Acceptance Test

User acceptance test will be performed to ensure that the system meets the end-users' requirements and is usable for them. There are 2 user acceptance test forms for this system which are for the admin and user.

Table 7 User Acceptance Test

Module	Activities	Status		Comment
		Yes	No	
Login	Login using the correct credentials			
Dashboard	View dashboard widgets, charts, and statistics			
News	View live news related to scam			
Topic	View list of topics			
	Create topic			
	Edit topic			
	Delete topic			
Question	View list of questions			
	Create question			
	Edit question			
	Delete question			
Quiz	View list of quizzes			
	Create quiz			

	Edit quiz			
	Delete quiz			
Post	View list of posts			
	Create post			
	Edit post			
	Delete post			
	Read post			
Category	View list of categories			
	Create category			
	Edit category			
	Delete category			
Author	View list of authors			
	Create author			
	Edit author			
	Delete author			
Role	View list of roles			
	Create role			
	Edit role			
	Delete role			
Role	View list of users			
	Create user			
	Edit user			
	Delete user			

3.8.2 Usability Test

Table 8 Usability Test

No	Activities	Strongly Agree		Strongly Disagree		
		1	2	3	4	5
1	The system works effectively for me.					
2	The system is user friendly (easy to use and to interact with).					
3	It is easy to use the system to answer the quiz.					
4	The system has high validation and clearly provides a guide to fulfill the requirement.					
5	The interface of the system is consistent.					
6	The system provides a clear information.					
7	The system has great information organization.					
8	The system fulfills all the requirements as an educational platform.					

3.9 Potential Use of Proposed Solution

The proposed solution, Securify, has the potential to be utilized in various ways to address social engineering and scams. One primary use is as an educational and training platform. Securify can serve as a comprehensive resource for individuals, businesses, and organizations seeking to understand and combat social engineering tactics. Through quizzes, scenarios, and interactive content, users can test their knowledge, learn about different types of social engineering attacks, and enhance their ability to recognize and respond to them effectively.

Another important use of Securify is in prevention and raising awareness. By providing users with access to the latest news and information about scams worldwide, the platform can serve as a valuable source for staying informed about emerging threats and trends in social engineering. This awareness can enable individuals and organizations to take proactive measures to protect themselves, such as implementing stronger security measures, educating employees, and fostering a culture of vigilance against social engineering attacks.

Securify can also benefit professionals in the cybersecurity field, including ethical hackers, security consultants, and law enforcement agencies. They can leverage the platform to stay updated on the latest social engineering techniques, case studies, and mitigation strategies, enhancing their expertise and contributing to the prevention and investigation of social engineering incidents.

Overall, the potential use of Securify spans education, prevention, and awareness. By providing a comprehensive platform for learning, staying informed, and enhancing cybersecurity practices, Securify has the potential to play a crucial role in combating social engineering attacks and reducing the risks associated with scams in various contexts.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Introduction

This chapter delves into the comprehensive implementation process of Securify, the social engineering educational system. Securify has been developed with meticulous attention to detail, leveraging the robust FilamentPHP framework as its foundation. This framework, specifically designed for rapid development of TALL stack applications, has played a pivotal role in ensuring the system's efficiency, scalability, and user-friendliness. Throughout the development journey, other essential tools and technologies, such as Visual Studio Code as the IDE, XAMPP for local development environment, and Sourcetree for version control, have been employed to facilitate seamless development and collaboration. The chapter will provide detailed insights into the implementation, including the integration of core functionalities, database design, and system architecture. Furthermore, the testing phase has been executed rigorously to identify and resolve any potential issues or bugs, guaranteeing a robust and reliable system for users. Through this chapter, readers will gain a comprehensive understanding of the development and implementation of Securify, showcasing the commitment to delivering a high-quality social engineering educational system.

4.2 Implementation Process

Implementation is a process to develop the system from the requirements to the fully functional system that can be used by the end users.

4.2.1 Setup Version Control

To provide a comprehensive explanation of setting up the version control for Securify, we will break down the topic into three parts – project hosting, usage of sourcetree, and branching strategy.

Part 1: Project Hosting

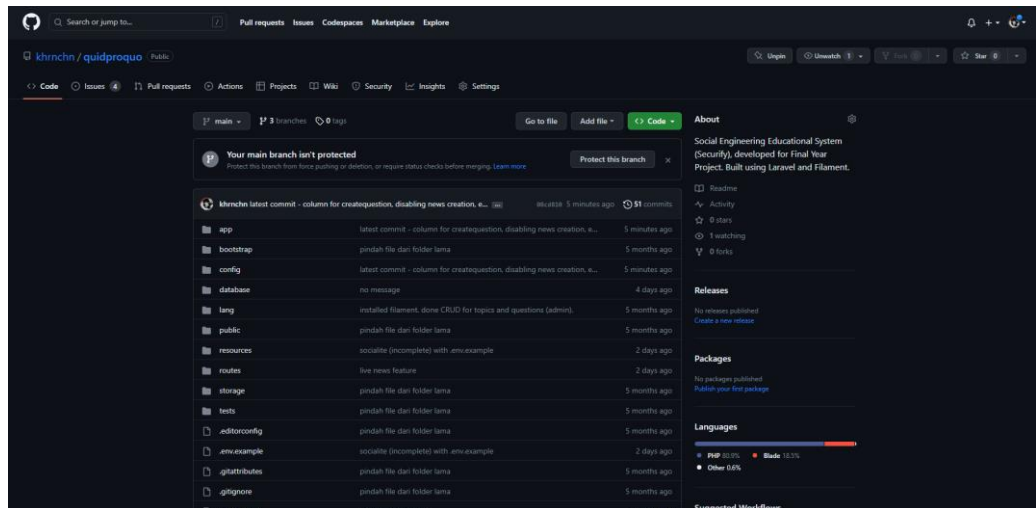


Figure 40 Github Repository

To host the Securify project on GitHub, I started by creating a repository on GitHub with the name "quidproquo." This repository serves as the central location for storing all the project files and related information. The repository's URL is github.com/khrnchn/quidproquo.

To provide an overview of the project to visitors, I edited the README file within the repository. The README file acts as a documentation source that includes essential information about the project, such as its purpose, features,

installation instructions, and usage guidelines. This ensures that anyone visiting the repository can quickly understand the project's scope and objectives.

During the development of Securify, I effectively utilized the Issues feature provided by GitHub. I created dedicated issues within the repository to track tasks, bugs, and discussions related to the project. Each issue contained detailed descriptions and specifications, assigned team members, and facilitated open communication and collaboration. By leveraging status labels, I could easily track the progress of each issue and ensure a structured and organized development process. The Issues feature played a crucial role in managing tasks, fostering collaboration, and maintaining transparency throughout the development of Securify.

By hosting the Securify project on GitHub, I leverage the benefits of a widely-used and trusted platform, enabling seamless collaboration, version control, and visibility of the project's development progress.

Part 2: Usage of Sourcetree

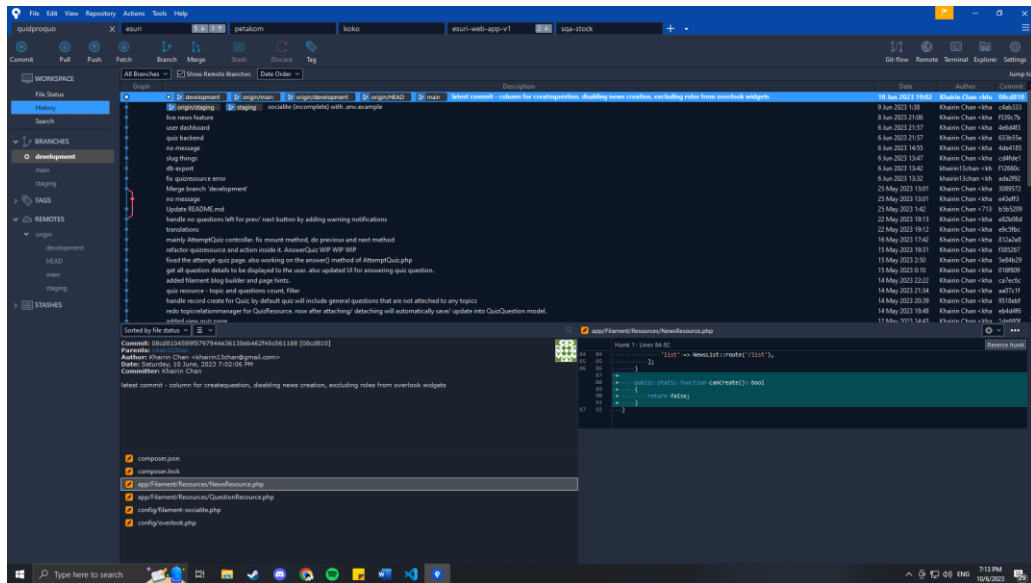


Figure 41 Sourcetree

As part of the version control setup, I used Sourcetree to clone the Securify project from the GitHub repository that I had previously created. Cloning the project allowed me to create a local copy of the codebase, enabling seamless collaboration and version control. Sourcetree provided an intuitive interface to perform the clone operation, ensuring that the project's files and commit history were accurately replicated on my local machine. This allowed me to work on the project, make changes, and easily synchronize my local copy with the remote repository on GitHub. Cloning the project using Sourcetree was a fundamental step in setting up the development environment for Securify.

Part 3: Branching Strategy

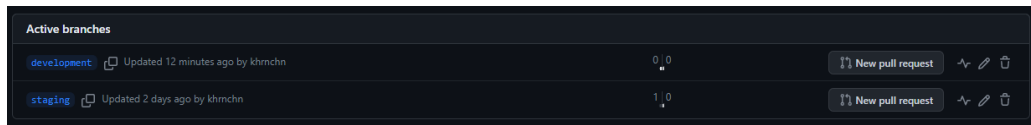


Figure 42 Project Branches

In the implementation process of Securify, a branching strategy was employed to manage the development workflow effectively. Alongside the main branch, two additional branches were created: the development branch and the staging branch. The development branch served as the primary branch for ongoing development work. It allowed for the integration of individual features and bug fixes in a separate environment, enabling continuous progress without directly impacting the main branch. The staging branch was utilized for pre-release testing and quality assurance. It served as a staging area where all the completed and tested features were merged for final testing before deployment. This branching strategy provided a structured approach to development, allowing for concurrent work on different features, easier collaboration, and the ability to thoroughly test changes before merging them into the main branch.

4.2.2 Design Database Structure

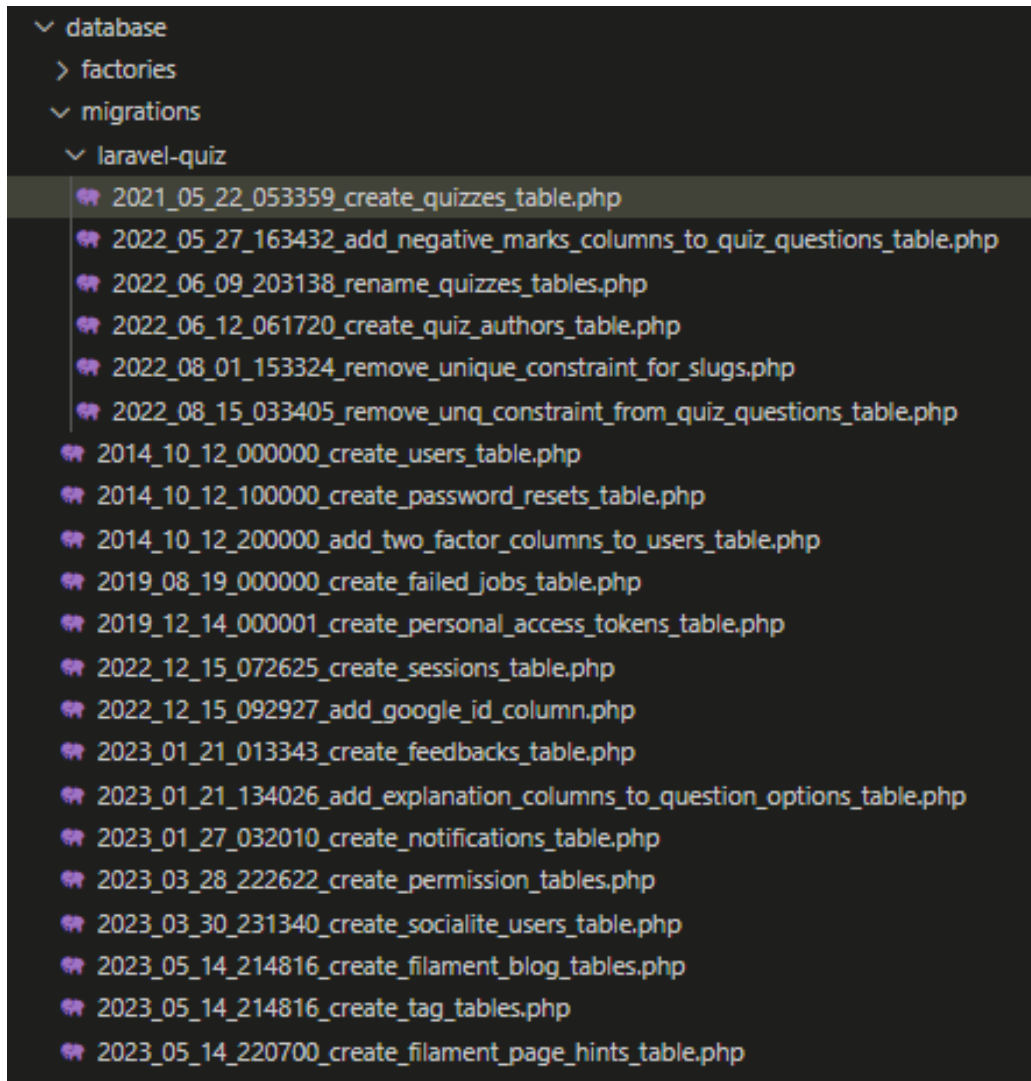
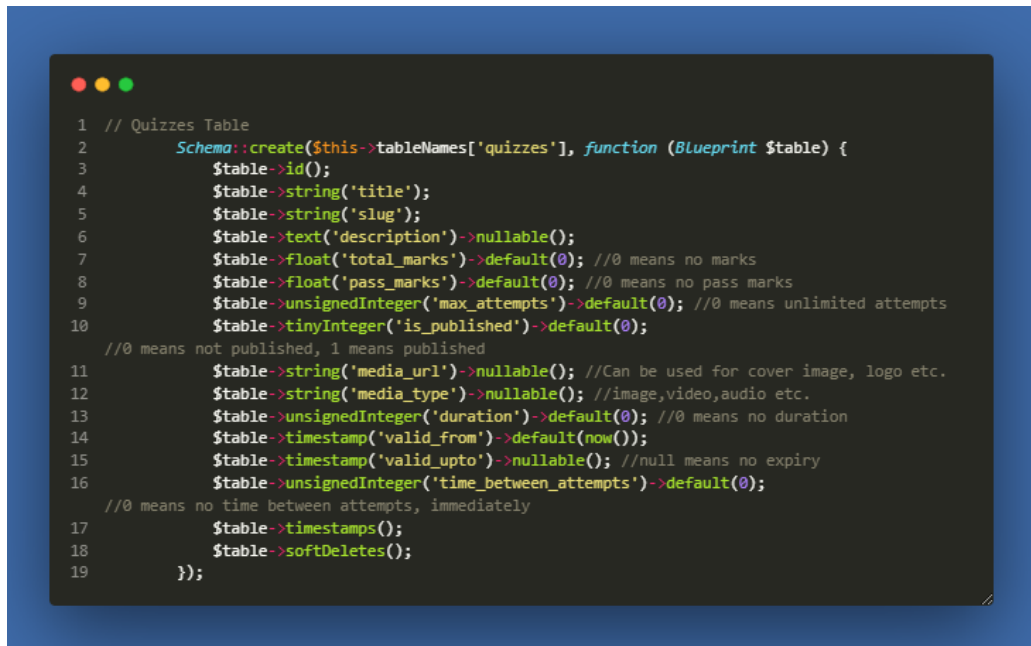


Figure 43 Migration Files

Before starting the development process of Securify, a detailed outline of the database structure was prepared. This involved defining the tables, their relationships, and the necessary fields to store and manage the required data. To bring this outline to life, I utilized Laravel's migration feature during the implementation phase. Migrations provided a structured approach to creating and managing the database schema using code. By defining migrations, I could specify the tables, their columns, data types, relationships, and any necessary constraints.

XAMPP's phpMyAdmin, a user-friendly web-based database management tool, was utilized to interact with the database. It facilitated the execution of migrations, allowing for the creation of the required tables and the management of the database structure. This approach ensured an organized and well-defined database structure to support the functionality of Securify throughout the development process.

A screenshot of a code editor with a dark background and light-colored text. The code is a PHP migration snippet for creating a 'quizzes' table. It includes comments explaining the purpose of various columns and their data types. The code is numbered from 1 to 19. The editor has a blue border and a window title bar with red, yellow, and green buttons.

```
1 // Quizzes Table
2 Schema::create($this->tableNames['quizzes'], function (Blueprint $table) {
3     $table->id();
4     $table->string('title');
5     $table->string('slug');
6     $table->text('description')->nullable();
7     $table->float('total_marks')->default(0); //0 means no marks
8     $table->float('pass_marks')->default(0); //0 means no pass marks
9     $table->unsignedInteger('max_attempts')->default(0); //0 means unlimited attempts
10    $table->tinyInteger('is_published')->default(0);
11    //0 means not published, 1 means published
12    $table->string('media_url')->nullable(); //Can be used for cover image, logo etc.
13    $table->string('media_type')->nullable(); //image,video,audio etc.
14    $table->unsignedInteger('duration')->default(0); //0 means no duration
15    $table->timestamp('valid_from')->default(now());
16    $table->timestamp('valid_upto')->nullable(); //null means no expiry
17    $table->unsignedInteger('time_between_attempts')->default(0);
18    //0 means no time between attempts, immediately
19    $table->timestamps();
20    $table->softDeletes();
21 });
```

Figure 44 Migration Code for Quiz Table

The above code snippet represents the migration for the "quizzes" table in the Securify project's database. It defines various columns for storing quiz-related information, such as the title, slug, description, total marks, pass marks, maximum attempts, publication status, media URL and type, duration, validity period, time between attempts, and timestamps. Additionally, the table includes soft deletes, allowing for the logical deletion of records while retaining their data in the database. This migration helps in setting up the necessary structure to store and manage quizzes within the Securify application.

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	bigint(20)		unsigned	No	None		AUTO_INCREMENT	Change Drop More
2	name	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
3	slug	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
4	description	text	utf8mb4_unicode_ci		Yes	NULL			Change Drop More
5	total_marks	double(8,2)			No	0.00			Change Drop More
6	pass_marks	double(8,2)			No	0.00			Change Drop More
7	negative_marking_settings	longtext	utf8mb4_bin		Yes	NULL			Change Drop More
8	max_attempts	int(10)		unsigned	No	0			Change Drop More
9	is_published	tinyint(4)			No	0			Change Drop More
10	media_url	varchar(255)	utf8mb4_unicode_ci		Yes	NULL			Change Drop More
11	media_type	varchar(255)	utf8mb4_unicode_ci		Yes	NULL			Change Drop More
12	duration	int(10)		unsigned	No	0			Change Drop More
13	valid_from	timestamp			No	2023-03-30 16:51:47			Change Drop More
14	valid_upto	timestamp			Yes	NULL			Change Drop More
15	time_between_attempts	int(10)		unsigned	No	0			Change Drop More
16	created_at	timestamp			Yes	NULL			Change Drop More
17	updated_at	timestamp			Yes	NULL			Change Drop More

Figure 45 Quiz Table in Phpmysqladmin

When the php artisan migrate command is executed, Laravel connects to the specified database, such as PHPMysqlAdmin, and automatically creates the required tables and modifies the database structure according to the defined migrations. In the case of the Securify project, the migrations include creating tables for topics, question types, questions, quizzes, and other related entities. In this example, the figure above shows the successful creation of the quizzes table.

4.2.3 Development of Securify

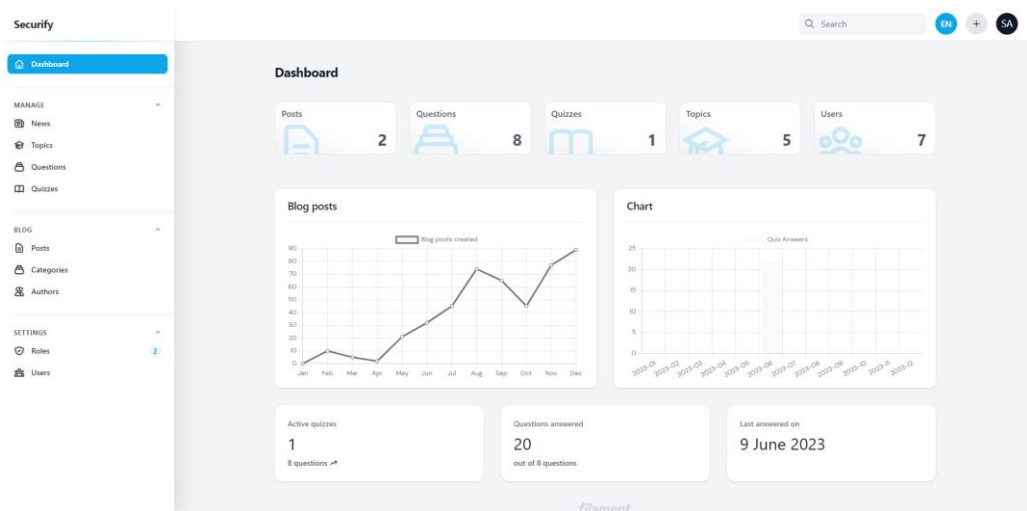


Figure 46 Administrator dashboard page

When the admin login to the system, they will be redirected to the first page which is the dashboard. As displayed in the figure, there are three types of widgets. The first type of widget is the system overview widget. It briefly shows how many resources there are for each model. The next type of widget is the chart widget, showing the number of blogposts and answers that have been submitted by the users. The third type of widget is the stats overview widget, showing the query results such as number of questions, answered questions, and more.

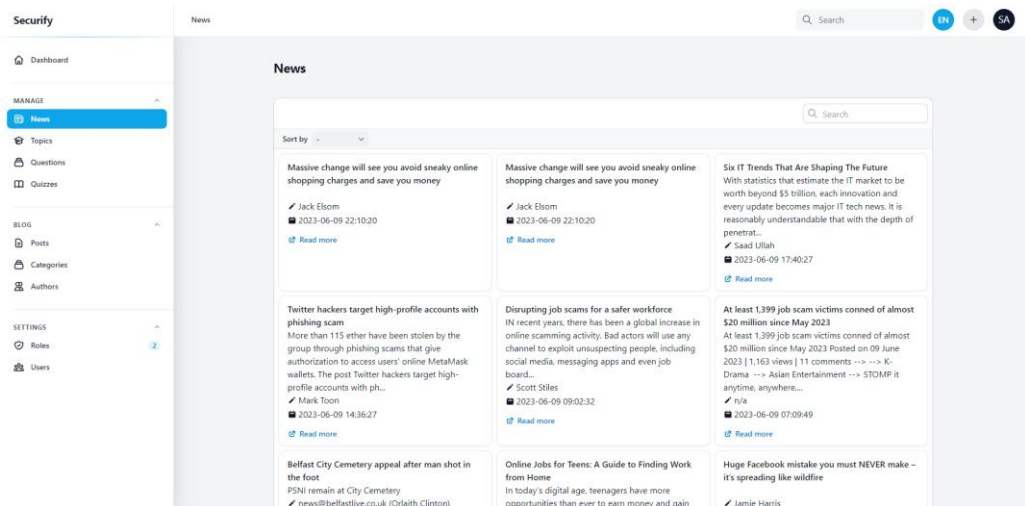


Figure 47 View list of live news

The page for viewing a list of news articles related to scams is designed to provide users with up-to-date information. The system utilizes the NewsData API to fetch live news from the last 48 hours from across the world using the keyword "scam". The UI presents a visually appealing and user-friendly list of news articles, displaying essential details such as the headline, author, publication date, and a brief summary of each article.

The UI also include additional features, such as search and filter options, allowing users to narrow down the displayed news articles based on specific criteria like date range, location, or related keywords. When the user click on the read news button, it will redirect the user to the news page.

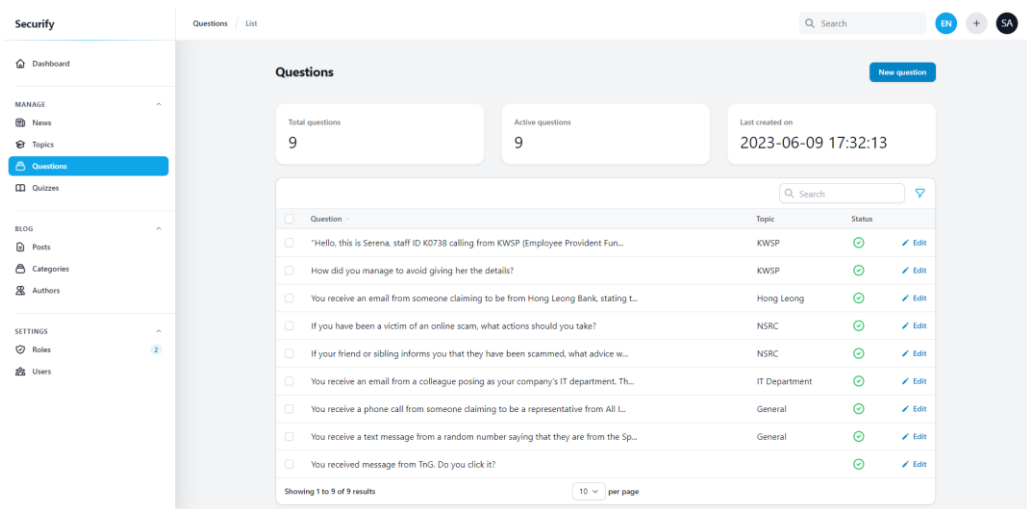


Figure 48 View list of questions

The figure above shows the question list interface. The administrator can view, search, and filter the questions. On the top right side, there is a 'New Question' button for the administrator to create a new question. While on each row of the record, there is an edit button for the administrator to edit the question.

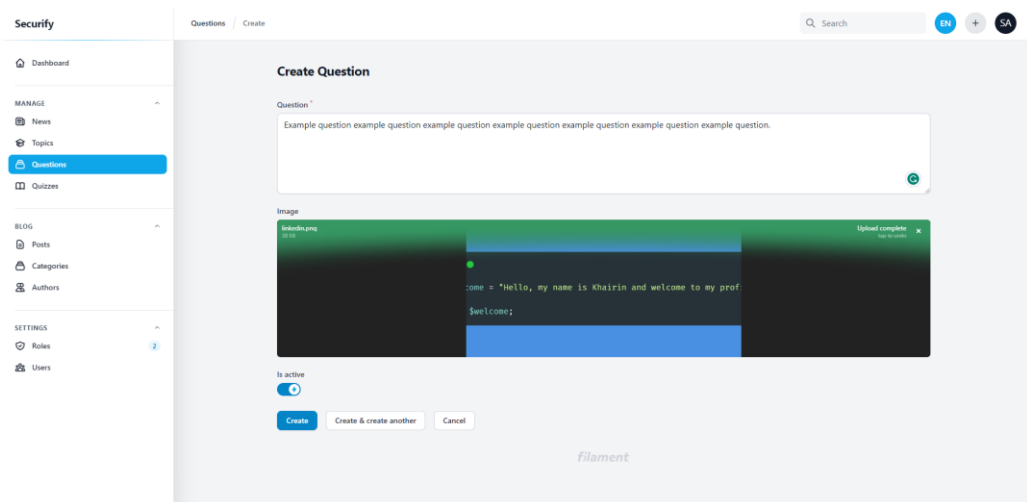


Figure 49 Create question

The question creation interface depicted above provides a user-friendly platform for administrators to input question details. The interface offers two distinct options for question creation: "Create" and "Create & Create Another." The "Create" option enables administrators to save the current question and proceed with other tasks, while the "Create & Create Another" option allows them to save the current question and immediately start creating another one. This streamlined approach enhances efficiency by eliminating the need to navigate back to the question creation interface for each subsequent question.

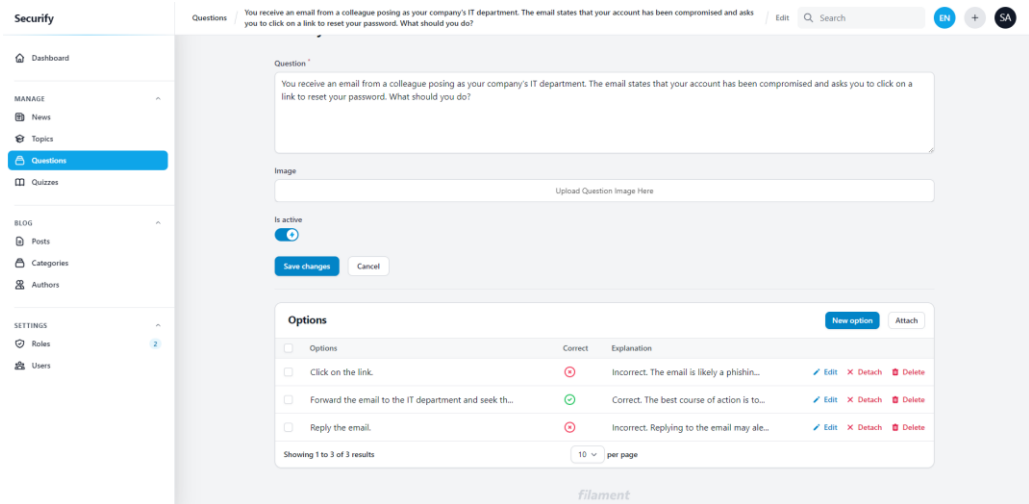


Figure 50 Create answers for question

After the creation of each question, the administrator can create options for the question. The administrator can also attach existing options to the question.

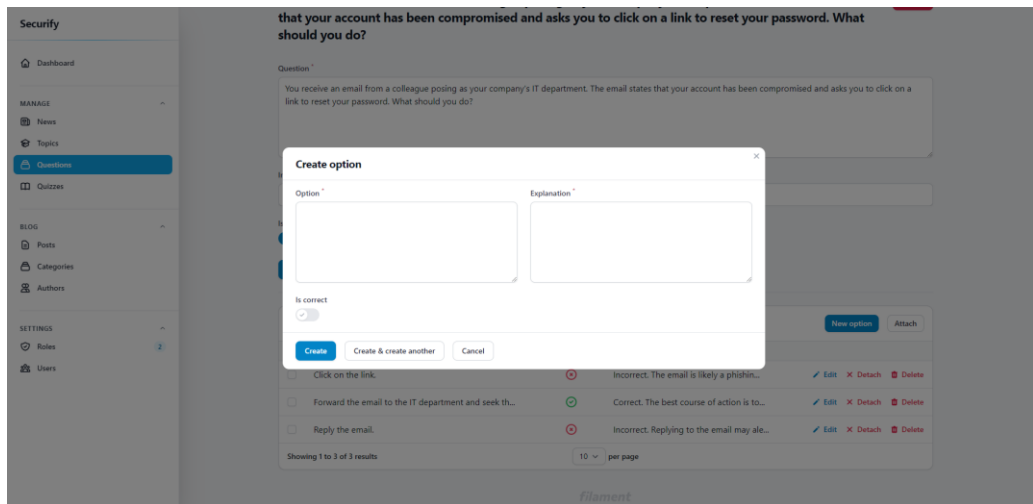


Figure 51 Enter answer details

The figure above shows the option creation modal for an individual question. The administrator can input the option, the explanation, and its status.

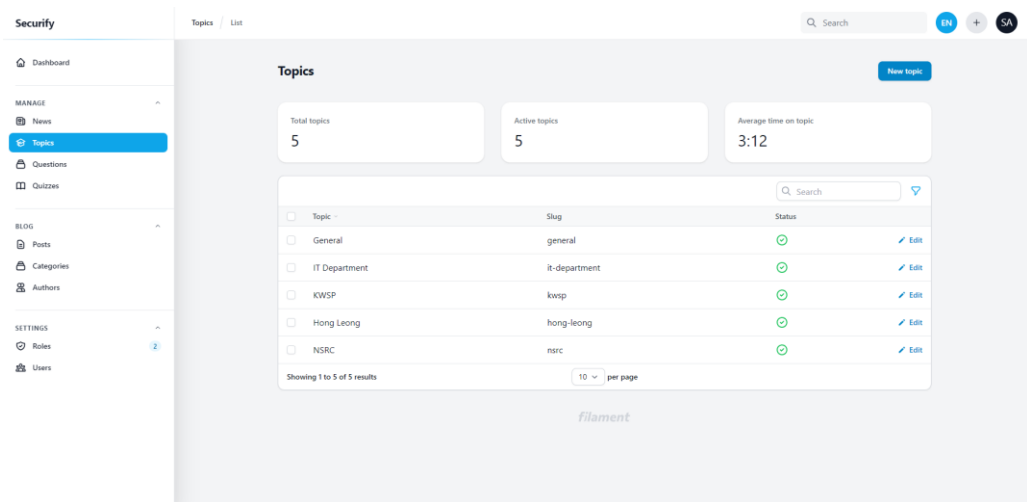


Figure 52 View list of topics page

The figure above shows the topic list interface. The administrator can view, search, and filter the topics. On the top right side, there is a ‘New Topic’ button for the administrator to create a new topic. While on each row of the record, there is an edit button for the administrator to edit the topic.

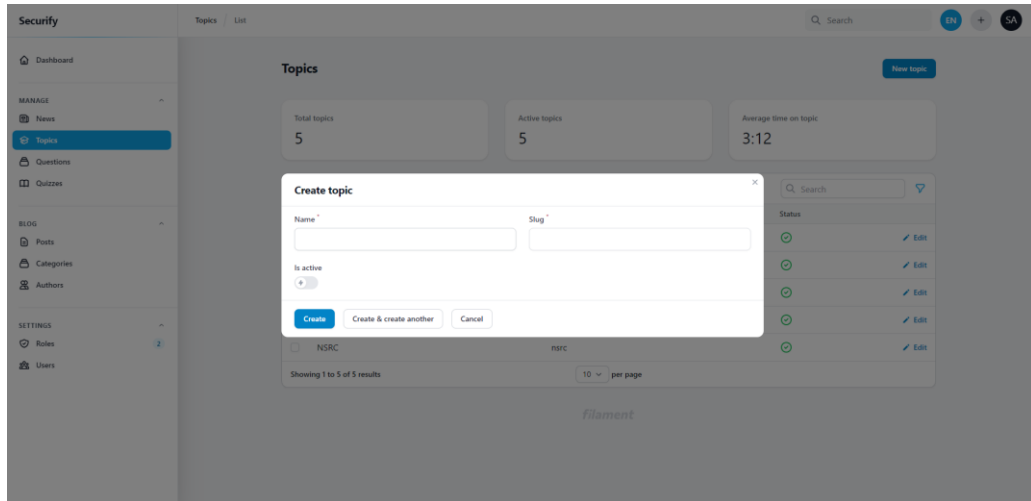


Figure 53 Create topic

The question creation interface depicted above provides a user-friendly modal for administrators to input topic details. The modal offers two distinct options for topic creation: "Create" and "Create & Create Another." The "Create" option enables administrators to save the current topic and proceed with other tasks, while the "Create & Create Another" option allows them to save the current topic and immediately start creating another one. This streamlined approach enhances efficiency by eliminating the need to navigate back to the topic creation interface for each subsequent question.

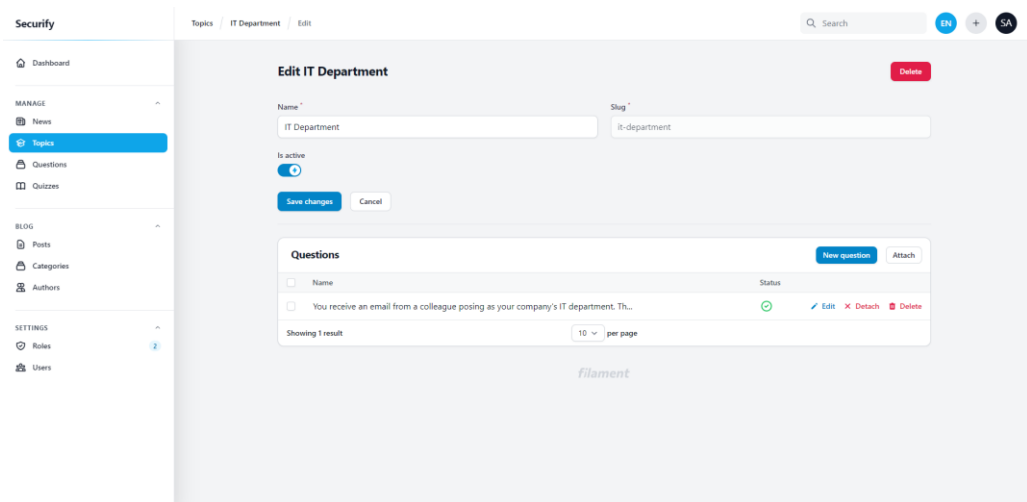


Figure 54 Create question for topic

Like the option creation flow, the administrator can also create questions for a topic using the Relation Manager feature provided by the FilamentPHP framework. The administrator can also attach existing questions to the topic.

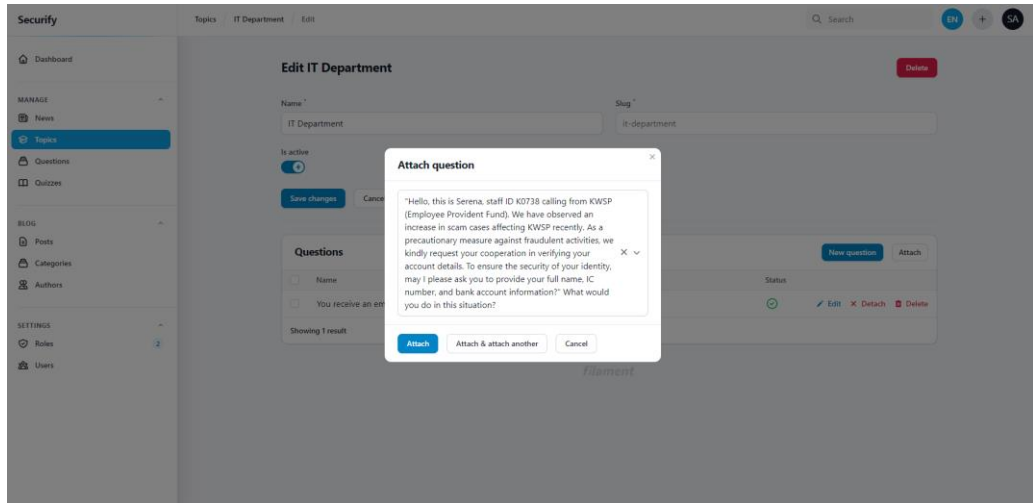


Figure 55 Attach question to topic

The above figure shows the modal for attaching question to a topic. The system provides a dropdown menu with the list of questions that can be attached.

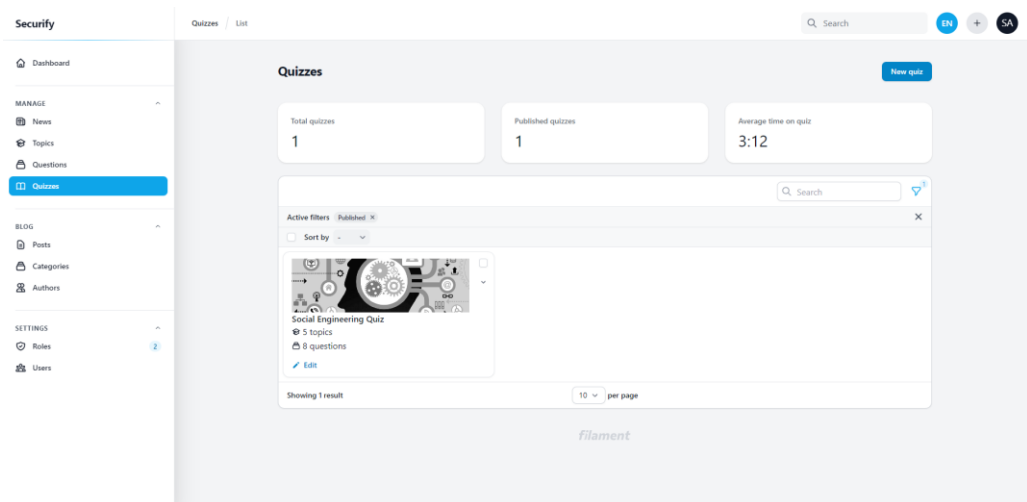


Figure 56 View list of quizzes

The figure above shows the quiz list interface. The administrator can view, search, and filter the quizzes. On the top right side, there is a 'New Quiz' button for the administrator to create a new quiz. While on each row of the record, there is an edit button for the administrator to edit the quiz.

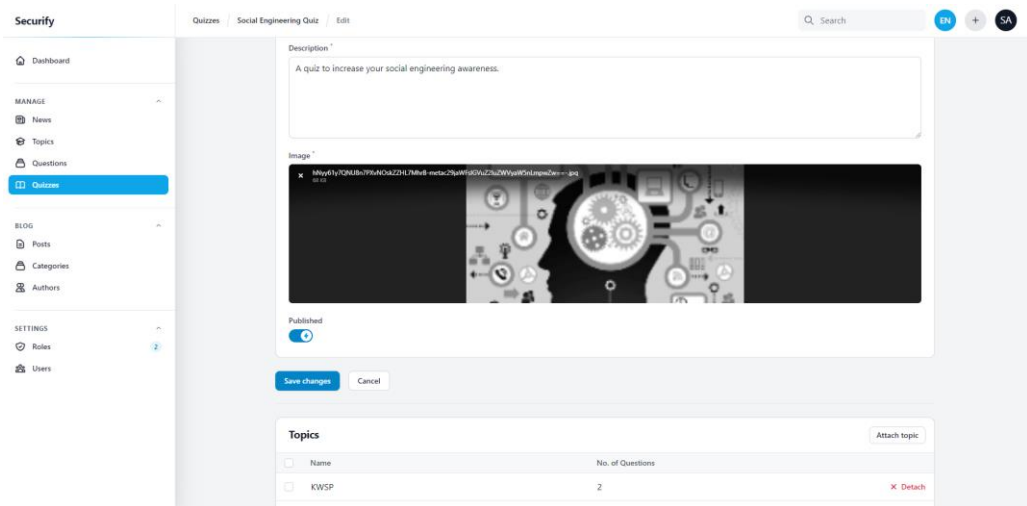


Figure 57 View and edit quiz details

The figure above shows the view and edit page for a quiz. As depicted in the user interface, there is a topic relation manager for the quiz. To add questions to a quiz, the administrator can attach the topic to the quiz. The quiz will then contain questions from the attached topic.

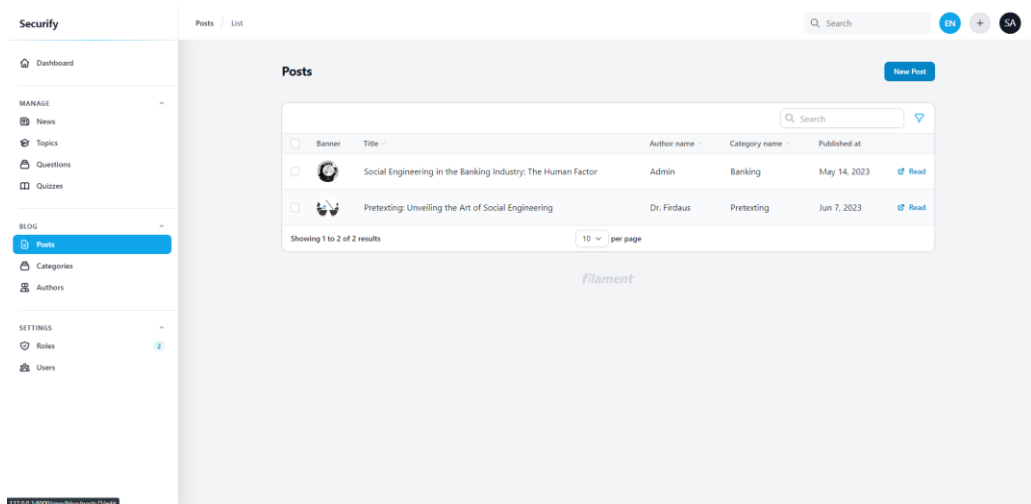


Figure 58 View list of blogs

The figure above shows the blog list interface. The administrator can view, search, and filter the blogs. On the top right side, there is a 'New Blog' button for the administrator to create a new blog. While on each row of the record, there is an edit button for the administrator to edit the blog.

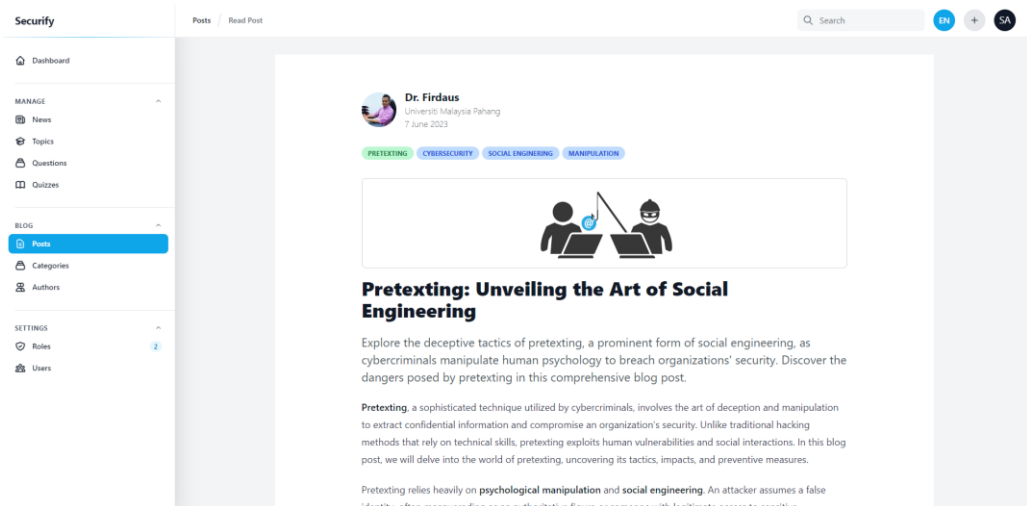


Figure 59 Read blog

The figure above shows the page for viewing blog. The administrator can preview the blog content that includes author details, categories, banner, title, excerpt, and content.

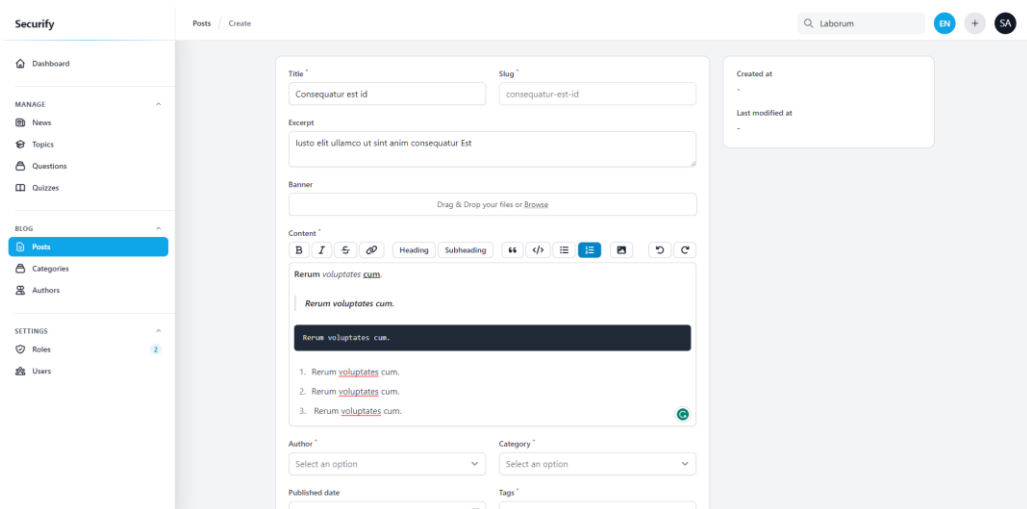


Figure 60 Create blog

The UI for blog creation in Securify incorporates a rich editor, providing administrators with a powerful and intuitive platform to compose and edit blog content. The rich editor interface offers a range of formatting options, including text formatting (such as bold, italic, underline), paragraph styles, alignment settings, and lists (both ordered and unordered). Administrators can easily insert images, videos, and hyperlinks into the blog content, enhancing its visual appeal and interactivity. Additionally, the rich editor supports advanced features like tables, code snippets, and customizable HTML elements, enabling administrators to create dynamic and engaging blog posts. With its user-friendly interface and comprehensive set of editing tools, the rich editor empowers administrators to craft compelling and visually appealing blog content within the Securify system.

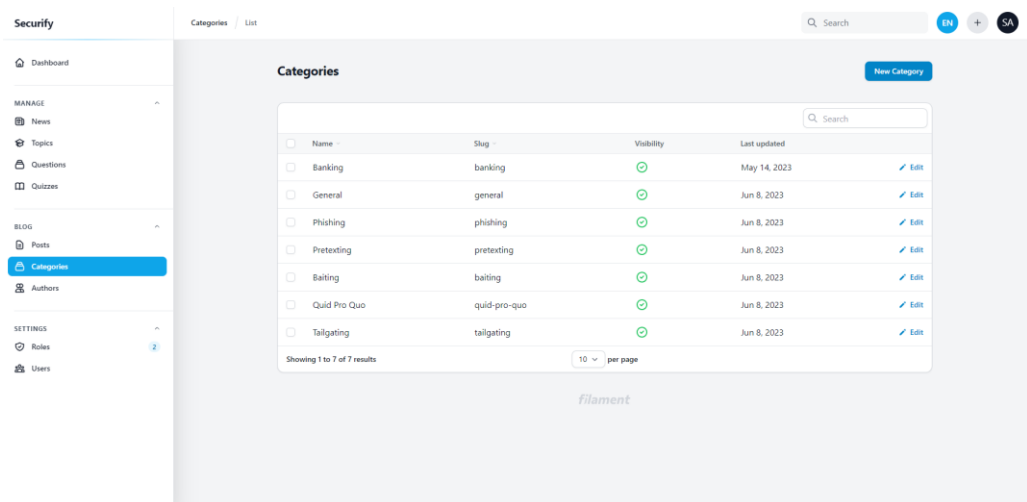


Figure 61 View list of categories

The figure above shows the category list interface. The administrator can view, search, and filter the categories. On the top right side, there is a ‘New Category’ button for the administrator to create a new category. While on each row of the record, there is an edit button for the administrator to edit the category.

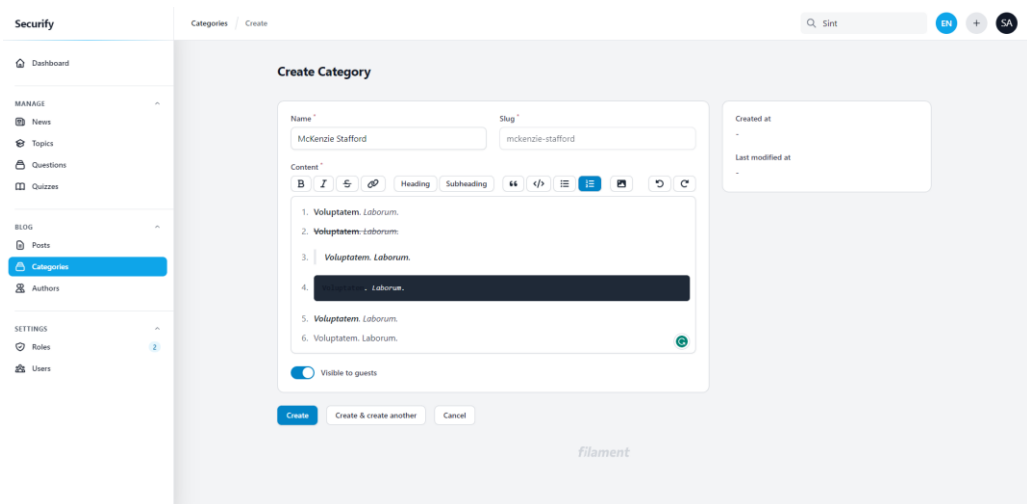


Figure 62 Create category

The category creation interface depicted above provides a user-friendly interface for administrators to input category details. The page offers two distinct options for category creation: "Create" and "Create & Create Another." The "Create" option enables administrators to save the current category and proceed with other tasks, while the "Create & Create Another" option allows them to save the current category and immediately start creating another one. This streamlined approach enhances efficiency by eliminating the need to navigate back to the category creation interface for each subsequent question.

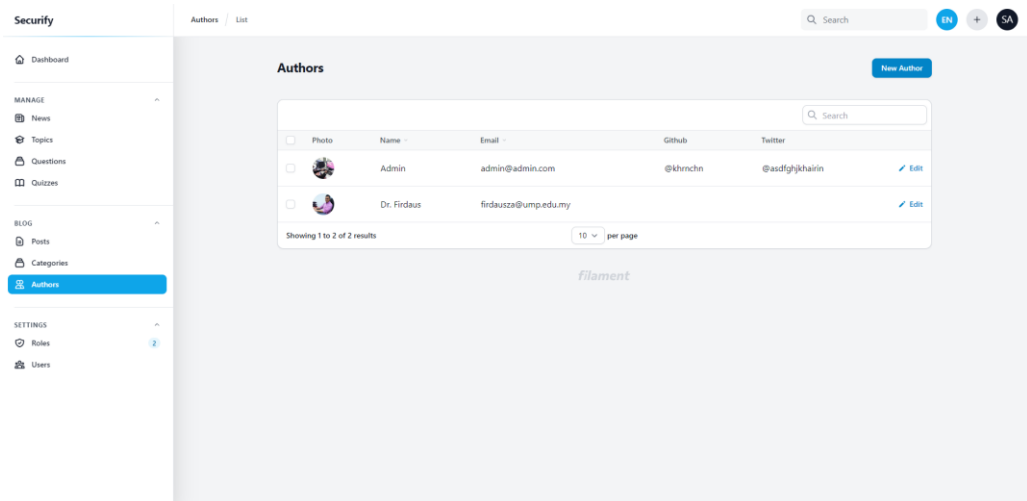


Figure 63 View list of authors

The figure above shows the author list interface. The administrator can view, search, and filter the authors. On the top right side, there is a 'New Author' button for the administrator to create a new author. While on each row of the record, there is an edit button for the administrator to edit the author.

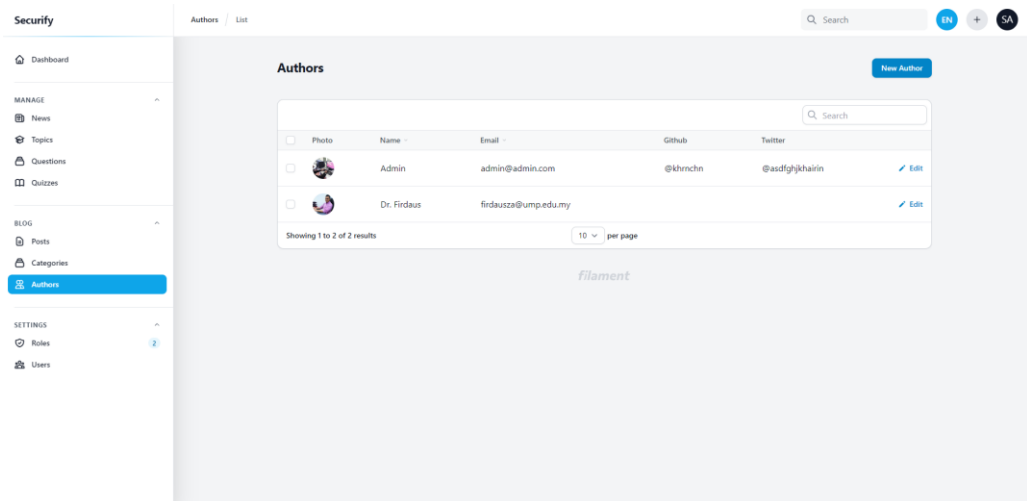


Figure 64 Create author

The category creation interface depicted above provides a user-friendly interface for administrators to input category details. The page offers two distinct options for category creation: "Create" and "Create & Create Another." The "Create" option enables administrators to save the current category and proceed with other tasks, while the "Create & Create Another" option allows them to save the current category and immediately start creating another one. This streamlined approach enhances efficiency by eliminating the need to navigate back to the category creation interface for each subsequent question.

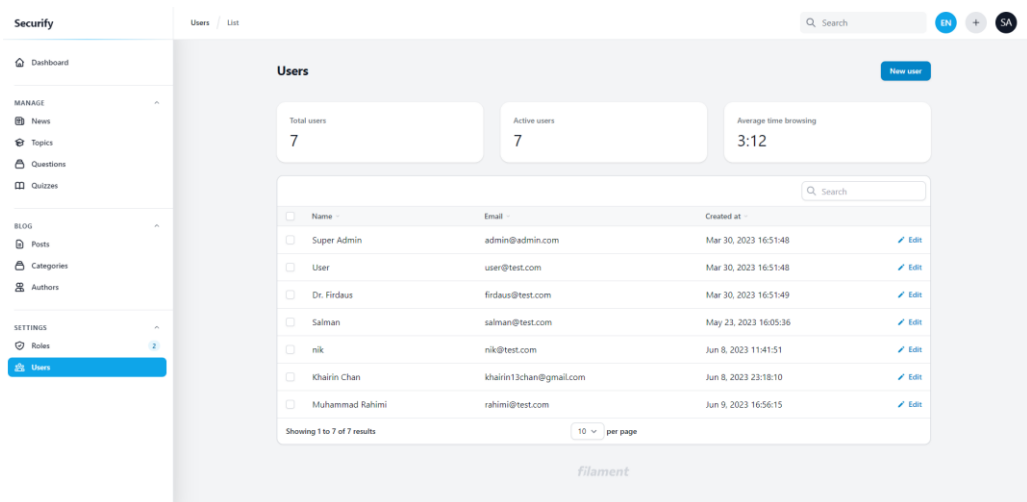


Figure 65 View list of users

The figure above shows the user list interface. The administrator can view, search, and filter the users. On the top right side, there is a 'New User' button for the administrator to create a new user. While on each row of the record, there is an edit button for the administrator to edit the user.

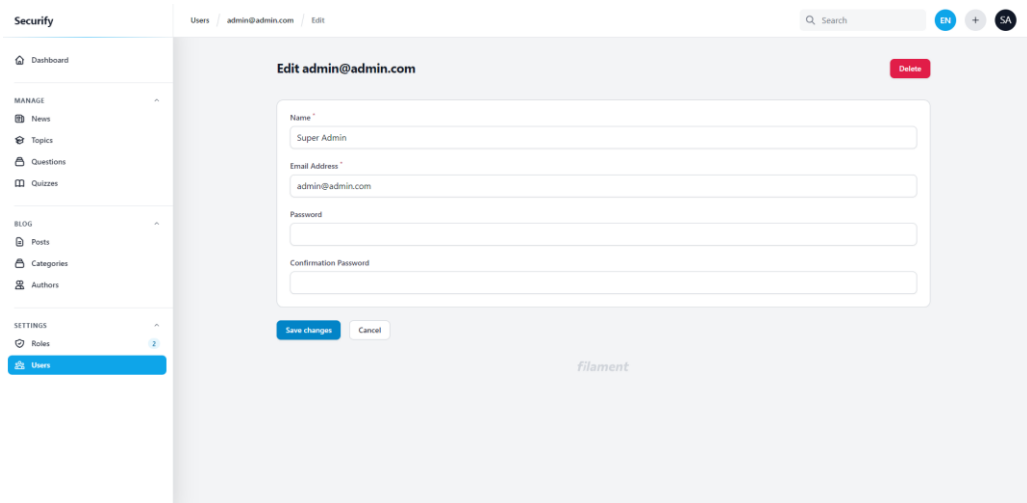


Figure 66 View and edit user details

The figure above shows the page for viewing and editing a user. The administrator can enter or update the user details such as name, and email address.

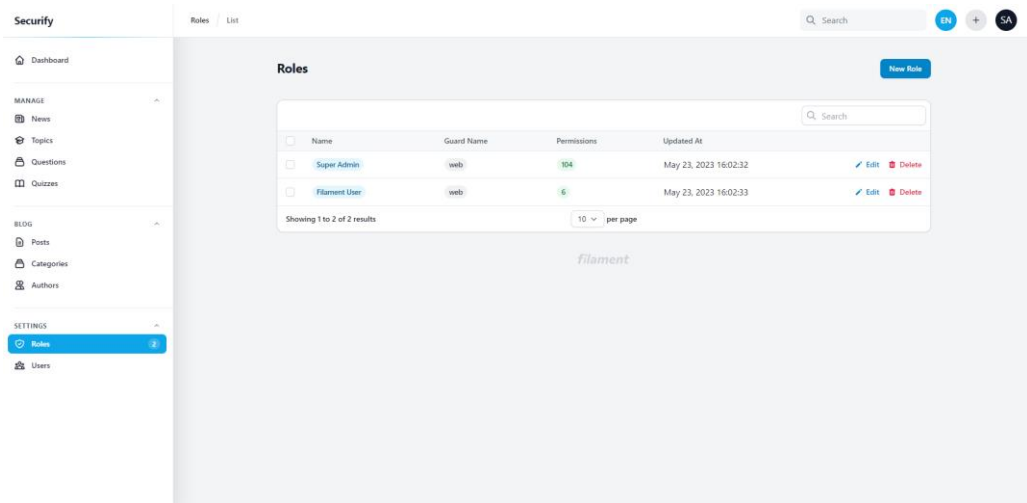


Figure 67 View list of roles

The figure above shows the role list interface. The administrator can view, search, and filter the roles. On the top right side, there is a 'New Role' button for the administrator to create a new role. While on each row of the record, there is an edit button for the administrator to edit the role.

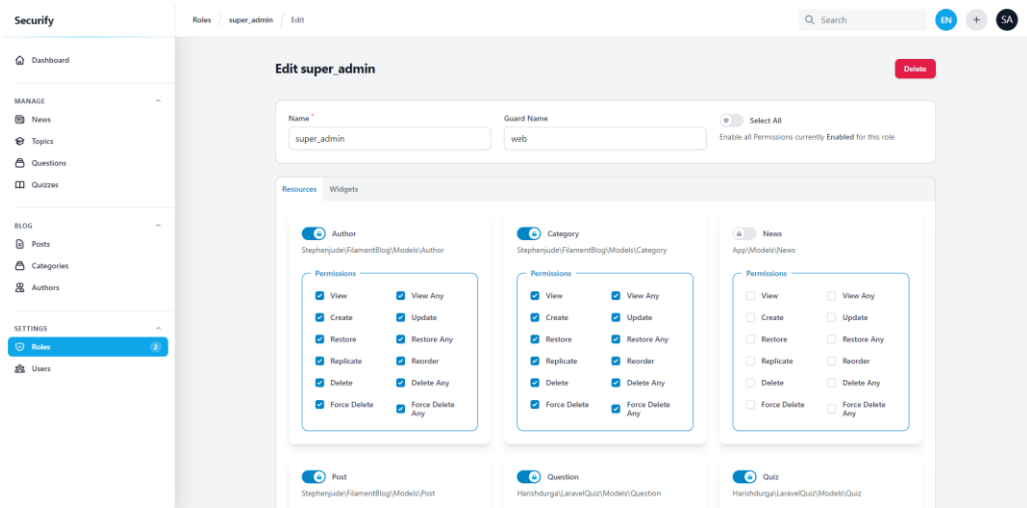


Figure 68 View and edit roles

The figure above shows the page for viewing and editing a role. The administrator can enter or update the role details specifically permissions for each resource.

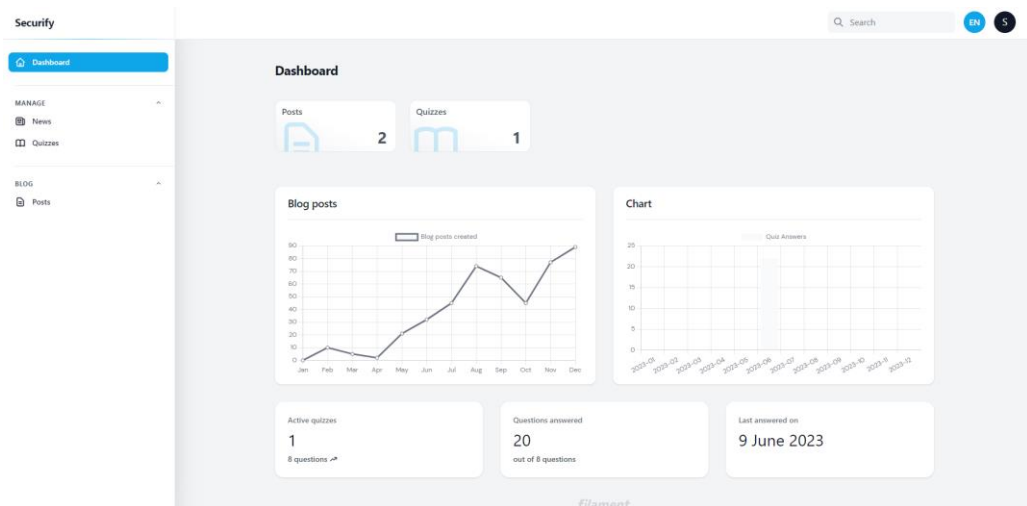


Figure 69 User dashboard

The figure above shows the dashboard page for the user. On the dashboard page, there are relevant information that are shown through widgets. There are three types of widgets – overview, charts, and cards.

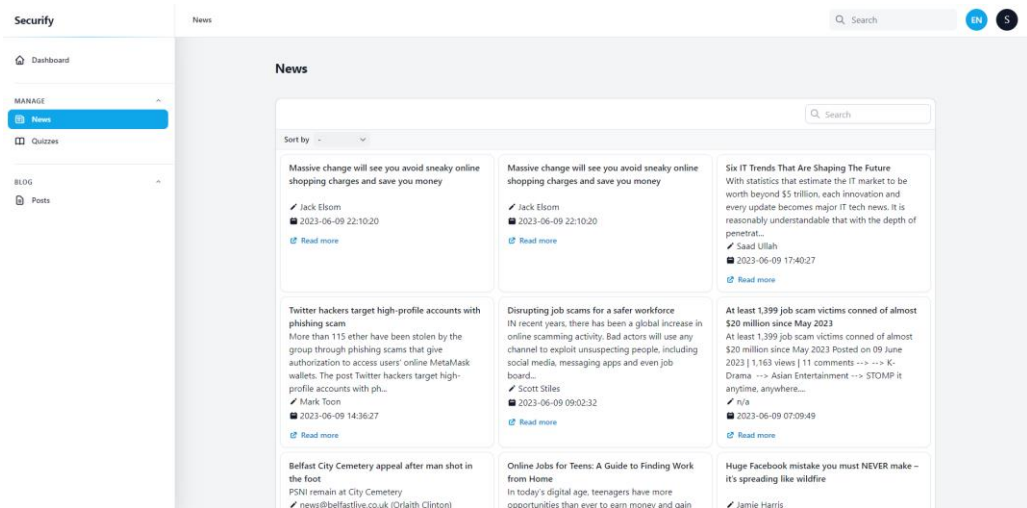


Figure 70 View list of live news

The page for viewing a list of news articles related to scams is designed to provide users with up-to-date information. The system utilizes the NewsData API to fetch live news from the last 48 hours from across the world using the keyword "scam". The UI presents a visually appealing and user-friendly list of news articles, displaying essential details such as the headline, author, publication date, and a brief summary of each article.

The UI also include additional features, such as search and filter options, allowing users to narrow down the displayed news articles based on specific criteria like date range, location, or related keywords. When the user click on the read news button, it will redirect the user to the news page.

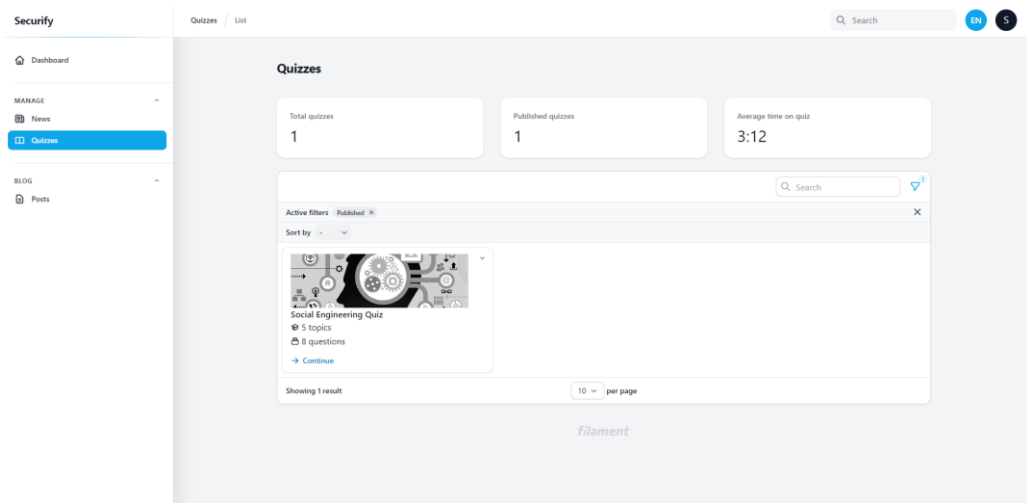


Figure 71 Quizzes

The figure above shows the quiz list interface. The user can view, search, and filter the quizzes. On each quiz card, there is an attempt or continue button for the user to answer or revise the quiz.

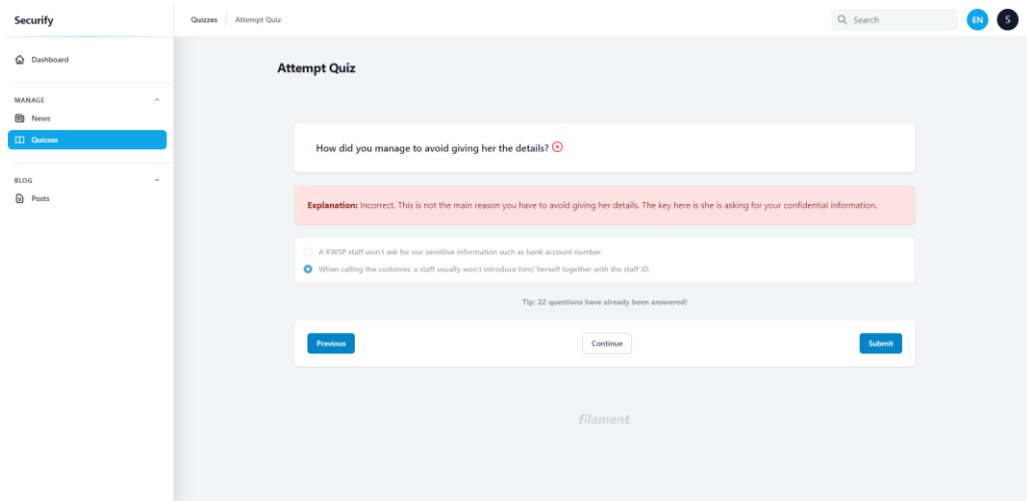


Figure 72 Attempt quiz

On the attempt quiz page, the user can answer questions related to social engineering scenarios. The user can navigate through questions by using the previous and continue button. The user can click on the submit button to save their option.

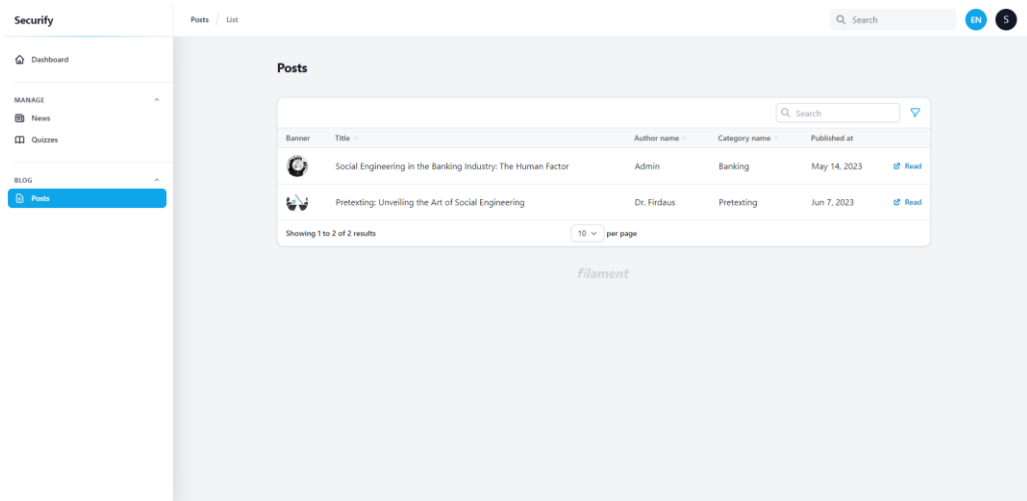


Figure 73 View list of blogs

The figure above shows the blog list interface. The user can view, search, and filter the blogs. While on each row of the record, there is a read button for the user to read the blog.

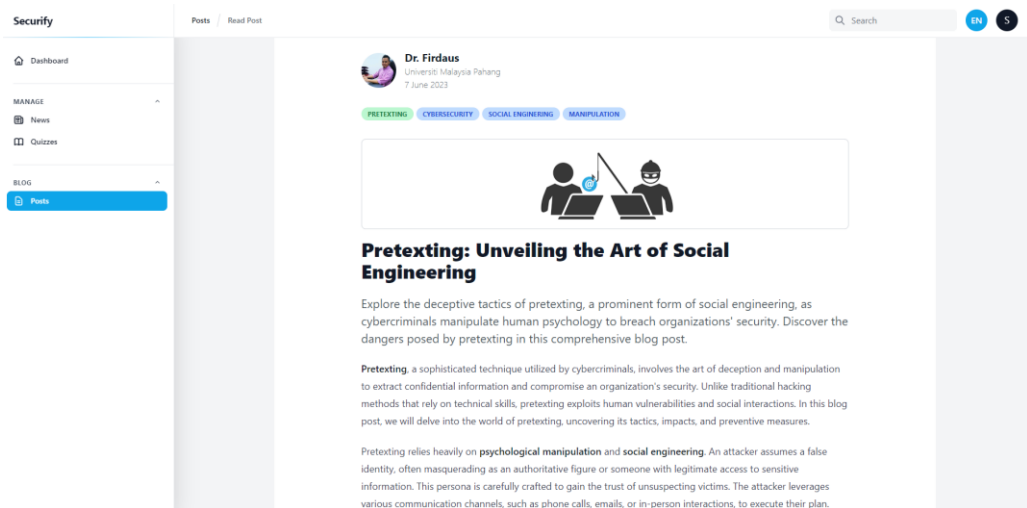


Figure 74 Read blog

The figure above shows the page for viewing blog. The user can read the blog content that includes author details, categories, banner, title, excerpt, and content.

4.3 Testing and Result Discussion

Once the development of Securify was complete, I proceeded with an extensive testing phase to evaluate the functionality and usability of the system. One critical component of the testing process was the User Acceptance Test (UAT), involving stakeholders and users who were given access to Securify to assess its features and capabilities. The UAT involved tasks such as navigating the user interface, performing various security-related actions, and providing feedback on the overall user experience. The purpose of the UAT was to gather user feedback, identify any potential issues or areas of improvement, and ensure that Securify met the requirements and expectations of its users. The result of the tests are attached to Appendix A.

In addition to the UAT, a feedback mechanism was established through a dedicated feedback form on the Securify platform. The form was designed to collect user input on the system's usability, effectiveness, and any suggestions for enhancements. The questions covered different aspects, including the clarity of security alerts, ease of configuration, and overall satisfaction with the system. The feedback collected through the form was invaluable in refining and enhancing the user experience of Securify. It allowed me to address usability issues, prioritize feature requests, and make necessary improvements based on user suggestions.

By incorporating both the UAT and the feedback form, Securify was able to undergo comprehensive testing and gather insights from actual users. This iterative approach ensured that the final product was robust, user-friendly, and aligned with the security needs of organizations and individuals. The valuable feedback obtained throughout the testing and evaluation phase played a crucial role in shaping Securify into an effective and reliable security solution.

CHAPTER 5

CONCLUSION

5.1 Introduction

The conclusion chapter presents a summary of the development journey of Securify, an innovative security solution that aims to become the preferred social engineering educational platform for individuals in Malaysia. Throughout its development, Securify has been designed with a specific focus on addressing the unique cybersecurity challenges faced by the local population. By providing comprehensive educational resources and practical tools, Securify aims to empower individuals to enhance their cybersecurity awareness and protect themselves from social engineering attacks.

What sets Securify apart from other cybersecurity awareness platforms is its emphasis on practicality and relevance. While many existing platforms offer general information on cybersecurity, Securify goes a step further by providing real-world scenarios and practical examples specific to the Malaysian context. This approach allows users to better understand and relate to the security challenges they may encounter in their daily lives, making the learning experience more engaging and effective.

By combining a user-friendly interface, interactive educational modules, and tailored content, Securify sets itself apart as a comprehensive and user-centric cybersecurity platform. Its mission is to equip individuals in Malaysia with the knowledge and skills necessary to safeguard their digital lives, fostering a safer and more secure online environment for all.

5.2 Discussion on User Acceptance

After the development phase of Securify, an implementation and evaluation process were conducted to assess the system's functionality, usability, and effectiveness. To validate the system's capabilities, a comprehensive User Acceptance Test (UAT) was carried out, where users were invited to explore and evaluate the key modules of Securify, including the Quiz Module, Topic Module, Question Module, News Module and more.

During the UAT, participants were given access to the various modules and were encouraged to interact with the system, attempting quizzes, exploring educational topics, and reading materials like news and blogs. The primary objective of the UAT was to ensure that all modules operated as intended and met the desired objectives of providing an engaging and informative social engineering educational platform.

Overall, the UAT results indicated that Securify's modules were successfully implemented and aligned with the initial objectives of creating a preferred social engineering educational platform in Malaysia. The positive feedback received during the evaluation process reinforced the effectiveness and usability of Securify, providing valuable insights for further improvements and enhancements.

5.3 Limitation and Constraint

As mentioned in Chapter 3, this project encountered several constraints that impacted its development and implementation. In this chapter, we will delve into the limitations and constraints faced in detail, highlighting the challenges and their implications on the project's outcome.

5.3.1 Time Constraint

To address the time constraint, I implemented a structured approach known as the Waterfall methodology. This allowed me to carefully plan and sequence the different phases of the development process. I established a project schedule with specific milestones and deadlines, ensuring that each phase of the project was completed within the allocated time frame.

As the sole author of the project, I took full responsibility for managing my time effectively. I created a detailed timeline that outlined the tasks and activities required for each phase of development. By breaking down the project into smaller, manageable tasks, I was able to allocate time for each task and prioritize them based on their importance and dependencies.

Throughout the development process, I closely monitored my progress against the established timeline. This allowed me to track my milestones and ensure that I was on track to meet the project's deadlines. If any deviations or delays were identified, I made adjustments to my work schedule and resource allocation to stay on track.

By following the Waterfall methodology and taking a disciplined approach to time management, I was able to overcome the time constraint and ensure that the development of the Securify platform progressed smoothly and met the desired timeline.

5.3.2 Technical Constraint

To address the technical constraints, I carefully evaluated different technology options and decided to use FilamentPHP for the development of Securify. The simplicity and ease of use offered by FilamentPHP helped overcome technical limitations efficiently. Additionally, I actively addressed compatibility issues, software dependencies, and hardware limitations by implementing appropriate workarounds and optimizations. These efforts ensured a smooth development process and a robust technical foundation for Securify.

5.3.3 Budget Constraint

To manage the budget constraint, I carefully planned and allocated financial resources for various aspects of the project. This included budgeting for system deployment, subscription to NewsData's API for data usage, server subscriptions, and other necessary expenses. I conducted thorough research to identify cost-effective solutions and explored alternatives to minimize expenses. By prioritizing essential components and optimizing resource allocation, I ensured that the project stayed within the allocated budget. Throughout the development process, I closely monitored and controlled the budget to avoid overspending and maintain financial discipline.

5.4 Future Work

Here are three potential additional features that can be considered for future development of Securify:

5.4.1 Social Engineering Simulation

Integrate a social engineering simulation module that allows users to experience and learn about different social engineering techniques in a safe and controlled environment. This feature can include simulated phishing attacks, impersonation scenarios, and other common social engineering tactics, providing users with hands-on experience and practical knowledge to better understand and defend against such threats.

5.4.2 Gamification Elements

Introduce gamification elements to enhance user engagement and motivation. This can include incorporating leaderboards, achievements, badges, and rewards based on user progress and performance within the platform. Gamification not only adds an element of fun but also encourages healthy competition among users, fostering a sense of accomplishment and continuous learning.

5.4.3 Interactive Case Studies

Develop interactive case studies that simulate real-world cybersecurity incidents and challenges. Users can engage with these case studies to analyze and assess different security scenarios, make decisions, and see the potential consequences of their actions. This feature will provide users with practical problem-solving skills, decision-making abilities, and critical thinking in a realistic context.

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<https://www.tripwire.com/state-of-security/5-social-engineering-attacks-to-watch-out-for>


APPENDICES


Appendix A User Acceptance Test

Module	Activities	Status		Comment
		Yes	No	
Login	Login using the correct credentials	x		No comment
Dashboard	View dashboard widgets, charts, and statistics	x		No comment
News	View live news related to scam	x		No comment
Topic	View list of topics	x		No comment
	Create topic	x		No comment
	Edit topic	x		No comment
	Delete topic	x		No comment
Question	View list of questions	x		No comment
	Create question	x		No comment
	Edit question	x		No comment
	Delete question	x		No comment
Quiz	View list of quizzes	x		No comment
	Create quiz	x		No comment

	Edit quiz	x		No comment
	Delete quiz	x		No comment
Post	View list of posts	x		No comment
	Create post	x		No comment
	Edit post	x		No comment
	Delete post	x		No comment
	Read post	x		No comment
Category	View list of categories	x		No comment
	Create category	x		No comment
	Edit category	x		No comment
	Delete category	x		No comment
Author	View list of authors	x		No comment
	Create author	x		No comment
	Edit author	x		No comment
	Delete author	x		No comment

Role	View list of roles	x		No comment
	Create role	x		No comment
	Edit role	x		No comment
	Delete role	x		No comment
Role	View list of users	x		No comment
	Create user	x		No comment
	Edit user	x		No comment
	Delete user	x		No comment

Conducted by	
Name	: AHMAD HISYAM BIN SURYANTO SUGIAN
Phone Number	: 012-6090772
Signature	: 


Verified by	
Name	: KHAIRIN CHAN BIN IBRAHIM CHAN
Phone Number	: CB20171
Signature	: 

Module	Activities	Status		Comment
		Yes	No	
Login	Login using the correct credentials	x		No comment
Dashboard	View dashboard widgets, charts, and statistics	x		No comment
News	View live news related to scam	x		No comment
Topic	View list of topics	x		No comment
	Create topic	x		No comment
	Edit topic	x		No comment
	Delete topic	x		No comment
Question	View list of questions	x		No comment
	Create question	x		No comment
	Edit question	x		No comment
	Delete question	x		No comment
Quiz	View list of quizzes	x		No comment
	Create quiz	x		No comment
	Edit quiz	x		No comment
	Delete quiz	x		No comment

	Attempt quiz	x		The quiz UX have a lot to be improved
Post	View list of posts	x		No comment
	Create post	x		No comment
	Edit post	x		No comment
	Delete post	x		No comment
	Read post	x		No comment
Category	View list of categories	x		No comment
	Create category	x		No comment
	Edit category	x		No comment
	Delete category	x		No comment
Author	View list of authors	x		No comment
	Create author	x		No comment
	Edit author	x		No comment
	Delete author	x		No comment
Role	View list of roles	x		No comment
	Create role	x		No comment
	Edit role	x		No comment

	Delete role	x		No comment
User	View list of users	x		No comment
	Create user	x		No comment
	Edit user	x		No comment
	Delete user	x		No comment


Conducted by	
Name	: MUHAMMAD IZZAT BIN MOHD RIZAL
Phone Number	: 013-296 1685
Signature	: 


Verified by	
Name	: KHAIRIN CHAN BIN IBRAHIM CHAN
Phone Number	: CB20171
Signature	: 

Module	Activities	Status		Comment
		Yes	No	
Login	Login using the correct credentials	x		No comment
Dashboard	View dashboard widgets, charts, and statistics	x		No comment
News	View live news related to scam	x		No comment
Topic	View list of topics	x		No comment
	Create topic	x		No comment
	Edit topic	x		No comment
	Delete topic	x		No comment
Question	View list of questions	x		No comment
	Create question	x		No comment
	Edit question	x		No comment
	Delete question	x		No comment
Quiz	View list of quizzes	x		No comment
	Create quiz	x		No comment
	Edit quiz	x		No comment
	Delete quiz	x		No comment

	Attempt quiz	x		The buttons are confusing
Post	View list of posts	x		No comment
	Create post	x		No comment
	Edit post	x		No comment
	Delete post	x		No comment
	Read post	x		No comment
Category	View list of categories	x		No comment
	Create category	x		No comment
	Edit category	x		No comment
	Delete category	x		No comment
Author	View list of authors	x		No comment
	Create author	x		No comment
	Edit author	x		No comment
	Delete author	x		No comment
Role	View list of roles	x		No comment
	Create role	x		No comment
	Edit role	x		No comment

	Delete role	x		No comment
User	View list of users	x		No comment
	Create user	x		No comment
	Edit user	x		No comment
	Delete user	x		No comment

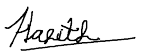
Conducted by	
Name	: NIK AHMAD FARIHIN BIN MOHD ZULKIFLI
Phone Number	: +60 14-839 3272
Signature	: 


Verified by	
Name	: KHAIRIN CHAN BIN IBRAHIM CHAN
Phone Number	: CB20171
Signature	: 

Module	Activities	Status		Comment
		Yes	No	
Login	Login using the correct credentials	x		No comment
Dashboard	View dashboard widgets, charts, and statistics	x		No comment
News	View live news related to scam	x		No comment
Topic	View list of topics	x		No comment
	Create topic	x		No comment
	Edit topic	x		No comment
	Delete topic	x		No comment
Question	View list of questions	x		No comment
	Create question	x		No comment
	Edit question	x		No comment
	Delete question	x		No comment
Quiz	View list of quizzes	x		No comment
	Create quiz	x		No comment
	Edit quiz	x		No comment
	Delete quiz	x		No comment

	Attempt quiz	x		I had difficulties navigating/ submitting answer
Post	View list of posts	x		No comment
	Create post	x		No comment
	Edit post	x		No comment
	Delete post	x		No comment
	Read post	x		No comment
Category	View list of categories	x		No comment
	Create category	x		No comment
	Edit category	x		No comment
	Delete category	x		No comment
Author	View list of authors	x		No comment
	Create author	x		No comment
	Edit author	x		No comment
	Delete author	x		No comment
Role	View list of roles	x		No comment
	Create role	x		No comment

	Edit role	x		No comment
	Delete role	x		No comment
User	View list of users	x		No comment
	Create user	x		No comment
	Edit user	x		No comment
	Delete user	x		No comment


Conducted by	
Name	: MUHD HARITH AIZAT BIN SUHAILI
Phone Number	: +60 11-4034 0426
Signature	: 


Verified by	
Name	: KHAIRIN CHAN BIN IBRAHIM CHAN
Phone Number	: CB20171
Signature	: 

Module	Activities	Status		Comment
		Yes	No	
Login	Login using the correct credentials	x		No comment
Dashboard	View dashboard widgets, charts, and statistics	x		No comment
News	View live news related to scam	x		No comment
Topic	View list of topics	x		No comment
	Create topic	x		No comment
	Edit topic	x		No comment
	Delete topic	x		No comment
Question	View list of questions	x		No comment
	Create question	x		No comment
	Edit question	x		No comment
	Delete question	x		No comment
Quiz	View list of quizzes	x		No comment
	Create quiz	x		No comment
	Edit quiz	x		No comment
	Delete quiz	x		No comment

	Attempt quiz	x		No comment
Post	View list of posts	x		No comment
	Create post	x		No comment
	Edit post	x		No comment
	Delete post	x		No comment
	Read post	x		No comment
Category	View list of categories	x		No comment
	Create category	x		No comment
	Edit category	x		No comment
	Delete category	x		No comment
Author	View list of authors	x		No comment
	Create author	x		No comment
	Edit author	x		No comment
	Delete author	x		No comment
Role	View list of roles	x		No comment
	Create role	x		No comment
	Edit role	x		No comment

	Delete role	x		No comment
User	View list of users	x		No comment
	Create user	x		No comment
	Edit user	x		No comment
	Delete user	x		No comment

Conducted by	
Name	: MUHAMAMAD HAZRIQ AKMAL BIN ZAIROL
Phone Number	: +60 12-330 2434
Signature	: 


Verified by	
Name	: KHAIRIN CHAN BIN IBRAHIM CHAN
Phone Number	: CB20171
Signature	: 

Module	Activities	Status		Comment
		Yes	No	
Login	Login using the correct credentials	x		No comment
Dashboard	View dashboard widgets, charts, and statistics	x		No comment
News	View live news related to scam	x		No comment
Topic	View list of topics	x		No comment
	Create topic	x		No comment
	Edit topic	x		No comment
	Delete topic	x		No comment
Question	View list of questions	x		No comment
	Create question	x		No comment
	Edit question	x		No comment
	Delete question	x		No comment
Quiz	View list of quizzes	x		No comment
	Create quiz	x		No comment
	Edit quiz	x		No comment
	Delete quiz	x		No comment

	Attempt quiz	x		Weird buttons, I expect the quiz to be like Kalam
Post	View list of posts	x		No comment
	Create post	x		No comment
	Edit post	x		No comment
	Delete post	x		No comment
	Read post	x		No comment
Category	View list of categories	x		No comment
	Create category	x		No comment
	Edit category	x		No comment
	Delete category	x		No comment
Author	View list of authors	x		No comment
	Create author	x		No comment
	Edit author	x		No comment
	Delete author	x		No comment
Role	View list of roles	x		No comment
	Create role	x		No comment

	Edit role	x		No comment
	Delete role	x		No comment
User	View list of users	x		No comment
	Create user	x		No comment
	Edit user	x		No comment
	Delete user	x		No comment


Conducted by	
Name	: MUHAMMAD IQMAL HAKIM BIN AMERUDDIN
Phone Number	: +60 10-767 9745
Signature	: 


Verified by	
Name	: KHAIRIN CHAN BIN IBRAHIM CHAN
Phone Number	: CB20171
Signature	: 

Module	Activities	Status		Comment
		Yes	No	
Login	Login using the correct credentials	x		No comment
Dashboard	View dashboard widgets, charts, and statistics	x		No comment
News	View live news related to scam	x		No comment
Topic	View list of topics	x		No comment
	Create topic	x		No comment
	Edit topic	x		No comment
	Delete topic	x		No comment
Question	View list of questions	x		No comment
	Create question	x		No comment
	Edit question	x		No comment
	Delete question	x		No comment
Quiz	View list of quizzes	x		No comment
	Create quiz	x		No comment
	Edit quiz	x		No comment
	Delete quiz	x		No comment

	Attempt quiz	x		Okay
Post	View list of posts	x		No comment
	Create post	x		No comment
	Edit post	x		No comment
	Delete post	x		No comment
	Read post	x		No comment
Category	View list of categories	x		No comment
	Create category	x		No comment
	Edit category	x		No comment
	Delete category	x		No comment
Author	View list of authors	x		No comment
	Create author	x		No comment
	Edit author	x		No comment
	Delete author	x		No comment
Role	View list of roles	x		No comment
	Create role	x		No comment
	Edit role	x		No comment

	Delete role	x		No comment
User	View list of users	x		No comment
	Create user	x		No comment
	Edit user	x		No comment
	Delete user	x		No comment


Conducted by	
Name	: FIRDAUS BIN MD SIDEK
Phone Number	: +60 16-494 4653
Signature	: 

Verified by	
Name	: KHAIRIN CHAN BIN IBRAHIM CHAN
Phone Number	: CB20171
Signature	: 

Module	Activities	Status		Comment
		Yes	No	
Login	Login using the correct credentials	x		No comment
Dashboard	View dashboard widgets, charts, and statistics	x		No comment
News	View live news related to scam	x		No comment
Topic	View list of topics	x		No comment
	Create topic	x		No comment
	Edit topic	x		No comment
	Delete topic	x		No comment
Question	View list of questions	x		No comment
	Create question	x		No comment
	Edit question	x		No comment
	Delete question	x		No comment
Quiz	View list of quizzes	x		No comment
	Create quiz	x		No comment
	Edit quiz	x		No comment
	Delete quiz	x		No comment

	Attempt quiz	x		Quite difficult to learn the UI at first
Post	View list of posts	x		No comment
	Create post	x		No comment
	Edit post	x		No comment
	Delete post	x		No comment
	Read post	x		No comment
Category	View list of categories	x		No comment
	Create category	x		No comment
	Edit category	x		No comment
	Delete category	x		No comment
Author	View list of authors	x		No comment
	Create author	x		No comment
	Edit author	x		No comment
	Delete author	x		No comment
Role	View list of roles	x		No comment
	Create role	x		No comment
	Edit role	x		No comment

	Delete role	x		No comment
User	View list of users	x		No comment
	Create user	x		No comment
	Edit user	x		No comment
	Delete user	x		No comment


Conducted by	
Name	: SALMAN BIN KHAIRUL ANUAR
Phone Number	: +60 11-3128 7855
Signature	: 


Verified by	
Name	: KHAIRIN CHAN BIN IBRAHIM CHAN
Phone Number	: CB20171
Signature	: 

Module	Activities	Status		Comment
		Yes	No	
Login	Login using the correct credentials	x		No comment
Dashboard	View dashboard widgets, charts, and statistics	x		No comment
News	View live news related to scam	x		No comment
Topic	View list of topics	x		No comment
	Create topic	x		No comment
	Edit topic	x		No comment
	Delete topic	x		No comment
Question	View list of questions	x		No comment
	Create question	x		No comment
	Edit question	x		No comment
	Delete question	x		No comment
Quiz	View list of quizzes	x		No comment
	Create quiz	x		No comment
	Edit quiz	x		No comment
	Delete quiz	x		No comment

	Attempt quiz	x		At first glance, the interface is weird because of the buttons
Post	View list of posts	x		No comment
	Create post	x		No comment
	Edit post	x		No comment
	Delete post	x		No comment
	Read post	x		No comment
Category	View list of categories	x		No comment
	Create category	x		No comment
	Edit category	x		No comment
	Delete category	x		No comment
Author	View list of authors	x		No comment
	Create author	x		No comment
	Edit author	x		No comment
	Delete author	x		No comment
Role	View list of roles	x		No comment
	Create role	x		No comment

	Edit role	x		No comment
	Delete role	x		No comment
User	View list of users	x		No comment
	Create user	x		No comment
	Edit user	x		No comment
	Delete user	x		No comment

Conducted by	
Name	: MUHAMMAD ASLAM BIN MAT ASRI
Phone Number	: +60 14-835 7667
Signature	: 


Verified by	
Name	: KHAIRIN CHAN BIN IBRAHIM CHAN
Phone Number	: CB20171
Signature	: 

Module	Activities	Status		Comment
		Yes	No	
Login	Login using the correct credentials	x		No comment
Dashboard	View dashboard widgets, charts, and statistics	x		No comment
News	View live news related to scam	x		No comment
Topic	View list of topics	x		No comment
	Create topic	x		No comment
	Edit topic	x		No comment
	Delete topic	x		No comment
Question	View list of questions	x		No comment
	Create question	x		No comment
	Edit question	x		No comment
	Delete question	x		No comment
Quiz	View list of quizzes	x		No comment
	Create quiz	x		No comment
	Edit quiz	x		No comment
	Delete quiz	x		No comment

	Attempt quiz	x		Quiz UI/ UX was unpleasant to me
Post	View list of posts	x		No comment
	Create post	x		No comment
	Edit post	x		No comment
	Delete post	x		No comment
	Read post	x		No comment
Category	View list of categories	x		No comment
	Create category	x		No comment
	Edit category	x		No comment
	Delete category	x		No comment
Author	View list of authors	x		No comment
	Create author	x		No comment
	Edit author	x		No comment
	Delete author	x		No comment
Role	View list of roles	x		No comment
	Create role	x		No comment
	Edit role	x		No comment

	Delete role	x		No comment
User	View list of users	x		No comment
	Create user	x		No comment
	Edit user	x		No comment
	Delete user	x		No comment

Conducted by	
Name	: MOHAMAD MOHSIN BIN ISMAIL
Phone Number	: +60 13-672 9087
Signature	: 

Verified by	
Name	: KHAIRIN CHAN BIN IBRAHIM CHAN
Phone Number	: CB20171
Signature	: 

Appendix B Data Dictionary

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1 blog_authors

Creation: May 14, 2023 at 09:48 PM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
id	bigint(20)	UNSIGNED	No		auto_increment			
name	varchar(255)		No					
email	varchar(255)		No					
photo	varchar(255)		Yes	NULL				
bio	longtext		Yes	NULL				
github_handle	varchar(255)		Yes	NULL				
twitter_handle	varchar(255)		Yes	NULL				
created_at	timestamp		Yes	NULL				
updated_at	timestamp		Yes	NULL				

2 blog_categories

Creation: May 14, 2023 at 09:48 PM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
id	bigint(20)	UNSIGNED	No		auto_increment			
name	varchar(255)		No					
slug	varchar(255)		No					
description	longtext		Yes	NULL				
is_visible	tinyint(1)		No	0				
seo_title	varchar(60)		Yes	NULL				
seo_description	varchar(160)		Yes	NULL				
created_at	timestamp		Yes	NULL				
updated_at	timestamp		Yes	NULL				

3 blog_posts

Creation: May 14, 2023 at 09:48 PM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
id	bigint(20)	UNSIGNED	No		auto_increment			
blog_author_id	bigint(20)	UNSIGNED	Yes	NULL		-> blog_authors.id ON UPDATE RESTRICT ON DELETE CASCADE		
blog_category_id	bigint(20)	UNSIGNED	Yes	NULL		-> blog_categories.id ON UPDATE RESTRICT ON DELETE SET_NULL		
title	varchar(255)		No					
slug	varchar(255)		No					
excerpt	text		Yes	NULL				
banner	varchar(255)		Yes	NULL				
content	longtext		No					
published_at	date		Yes	NULL				
created_at	timestamp		Yes	NULL				
updated_at	timestamp		Yes	NULL				

4 failed_jobs

Creation: Dec 15, 2022 at 04:48 PM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
id	bigint(20)	UNSIGNED	No		auto_increment			
uuid	varchar(255)		No					
connection	text		No					
queue	text		No					
payload	longtext		No					
exception	longtext		No					
failed_at	timestamp		No	current_timestamp()				

5 feedbacks

Creation: Jan 21, 2023 at 01:43 PM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
id	bigint(20)	UNSIGNED	No		auto_increment			
created_at	timestamp		Yes	NULL				
updated_at	timestamp		Yes	NULL				

6 filament_page_hints

Creation: May 14, 2023 at 10:07 PM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
id	bigint(20)	UNSIGNED	No		auto_increment			
uuid	char(36)		No					
title	varchar(255)		No					
route	varchar(255)		No					
url	varchar(255)		Yes	NULL				
hint	text		No					
created_at	timestamp		Yes	NULL				
updated_at	timestamp		Yes	NULL				

7 migrations

Creation: Dec 15, 2022 at 04:48 PM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
id	int(10)	UNSIGNED	No		auto_increment			
migration	varchar(255)		No					
batch	int(11)		No					

8 model_has_permissions

Creation: Mar 28, 2023 at 10:26 PM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
permission_id	bigint(20)	UNSIGNED	No			-> permissions.id ON UPDATE RESTRICT ON DELETE CASCADE		
model_type	varchar(255)		No					
model_id	bigint(20)	UNSIGNED	No					

9 model_has_roles

Creation: Mar 28, 2023 at 10:26 PM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
role_id	bigint(20)	UNSIGNED	No			-> roles.id ON UPDATE RESTRICT ON DELETE CASCADE		
model_type	varchar(255)		No					
model_id	bigint(20)	UNSIGNED	No					

10 notifications

Creation: Mar 28, 2023 at 10:26 PM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
id	char(36)		No					
type	varchar(255)		No					
notifiable_type	varchar(255)		No					
notifiable_id	bigint(20)	UNSIGNED	No					
data	text		No					
read_at	timestamp		Yes	NULL				
created_at	timestamp		Yes	NULL				
updated_at	timestamp		Yes	NULL				

11 password_resets

Creation: Dec 15, 2022 at 04:48 PM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
email	varchar(255)		No					
token	varchar(255)		No					
created_at	timestamp		Yes	NULL				

12 permissions

Creation: Mar 28, 2023 at 10:26 PM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
id	bigint(20)	UNSIGNED	No		auto_increment			
name	varchar(255)		No					
guard_name	varchar(255)		No					
created_at	timestamp		Yes	NULL				
updated_at	timestamp		Yes	NULL				

13 personal_access_tokens

Creation: Dec 15, 2022 at 04:48 PM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
id	bigint(20)	UNSIGNED	No		auto_increment			
tokenable_type	varchar(255)		No					
tokenable_id	bigint(20)	UNSIGNED	No					
name	varchar(255)		No					
token	varchar(64)		No					
abilities	text		Yes	NULL				
last_used_at	timestamp		Yes	NULL				
expires_at	timestamp		Yes	NULL				
created_at	timestamp		Yes	NULL				
updated_at	timestamp		Yes	NULL				

14 questions

Creation: Mar 30, 2023 at 10:57 PM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
id	bigint(20)	UNSIGNED	No		auto_increment			
name	text		No					
question_type_id	bigint(20)	UNSIGNED	Yes	NULL			-> question_types.id ON UPDATE RESTRICT ON DELETE CASCADE	
image_path	text		Yes	NULL				
media_type	varchar(255)		Yes	NULL				
is_active	tinyint(1)		No	1				
created_at	timestamp		Yes	NULL				
updated_at	timestamp		Yes	NULL				
deleted_at	timestamp		Yes	NULL				

15 question_options

Creation: Jan 21, 2023 at 01:46 PM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
id	bigint(20)	UNSIGNED	No		auto_increment			
question_id	bigint(20)	UNSIGNED	Yes	NULL		-> questions.id ON UPDATE RESTRICT ON DELETE CASCADE		
name	varchar(255)		Yes	NULL				
media_url	varchar(255)		Yes	NULL				
media_type	varchar(255)		Yes	NULL				
is_correct	tinyint(1)		No	0				
explanation	varchar(255)		Yes	NULL				
created_at	timestamp		Yes	NULL				
updated_at	timestamp		Yes	NULL				
deleted_at	timestamp		Yes	NULL				

16 question_types

Creation: Jan 20, 2023 at 12:38 AM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
id	bigint(20)	UNSIGNED	No		auto_increment			
name	varchar(255)		No					
created_at	timestamp		Yes	NULL				
updated_at	timestamp		Yes	NULL				
deleted_at	timestamp		Yes	NULL				

17 quizzes

Creation: Jan 20, 2023 at 12:38 AM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
id	bigint(20)	UNSIGNED	No		auto_increment			
name	varchar(255)		No					
slug	varchar(255)		No					
description	text		Yes	NULL				
total_marks	double(8,2)		No	0.00				
pass_marks	double(8,2)		No	0.00				
negative_marking_settings	longtext		Yes	NULL				
max_attempts	int(10)	UNSIGNED	No	0				
is_published	tinyint(4)		No	0				
media_url	varchar(255)		Yes	NULL				
media_type	varchar(255)		Yes	NULL				
duration	int(10)	UNSIGNED	No	0				
valid_from	timestamp		No	2023-03-30 16:51:47				
valid_upto	timestamp		Yes	NULL				
time_between_attempts	int(10)	UNSIGNED	No	0				
created_at	timestamp		Yes	NULL				
updated_at	timestamp		Yes	NULL				
deleted_at	timestamp		Yes	NULL				

18 quiz_attempts

Creation: Apr 08, 2023 at 11:15 PM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
id	bigint(20)	UNSIGNED	No		auto_increment			
quiz_id	bigint(20)	UNSIGNED	Yes	NULL		-> quizzes.id ON UPDATE RESTRICT ON DELETE CASCADE		
participant_id	int(10)	UNSIGNED	No					
created_at	timestamp		Yes	NULL				
updated_at	timestamp		Yes	NULL				
deleted_at	timestamp		Yes	NULL				

19 quiz_attempt_answers

Creation: May 14, 2023 at 11:20 PM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
id	bigint(20)	UNSIGNED	No		auto_increment			
quiz_attempt_id	bigint(20)	UNSIGNED	Yes	NULL		-> quiz_attempts.id ON UPDATE RESTRICT ON DELETE CASCADE		
quiz_question_id	bigint(20)	UNSIGNED	Yes	NULL		-> quiz_questions.id ON UPDATE RESTRICT ON DELETE CASCADE		
question_option_id	bigint(20)	UNSIGNED	Yes	NULL		-> question_options.id ON UPDATE RESTRICT ON DELETE CASCADE		
current_question_id	int(11)		Yes	NULL				
answer	varchar(255)		Yes	NULL				
created_at	timestamp		Yes	NULL				
updated_at	timestamp		Yes	NULL				
deleted_at	timestamp		Yes	NULL				

20 quiz_authors

Creation: Jan 04, 2023 at 12:02 AM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
id	bigint(20)	UNSIGNED	No		auto_increment			
quiz_id	bigint(20)	UNSIGNED	Yes	NULL			-> quizzes.id ON UPDATE RESTRICT ON DELETE CASCADE	
author_id	int(10)	UNSIGNED	No					
author_type	varchar(255)		No					
author_role	varchar(255)		Yes	NULL				
is_active	tinyint(1)		No	1				
created_at	timestamp		Yes	NULL				
updated_at	timestamp		Yes	NULL				
deleted_at	timestamp		Yes	NULL				

21 quiz_questions

Creation: May 14, 2023 at 06:05 PM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
id	bigint(20)	UNSIGNED	No		auto_increment			
quiz_id	bigint(20)	UNSIGNED	Yes	NULL		-> quizzes.id ON UPDATE RESTRICT ON DELETE CASCADE		
question_id	bigint(20)	UNSIGNED	Yes	NULL		-> questions.id ON UPDATE RESTRICT ON DELETE CASCADE		
marks	double(8,2)	UNSIGNED	No	0.00				
negative_marks	double(8,2)	UNSIGNED	No	0.00				
is_optional	tinyint(1)		No	0				
order	int(10)	UNSIGNED	No	0				
created_at	timestamp		Yes	NULL				
updated_at	timestamp		Yes	NULL				
deleted_at	timestamp		Yes	NULL				

22 roles

Creation: Mar 28, 2023 at 10:26 PM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
id	bigint(20)	UNSIGNED	No		auto_increment			
name	varchar(255)		No					
guard_name	varchar(255)		No					
created_at	timestamp		Yes	NULL				
updated_at	timestamp		Yes	NULL				

23 role_has_permissions

Creation: Mar 28, 2023 at 10:26 PM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
permission_id	bigint(20)	UNSIGNED	No			-> permissions.id ON UPDATE RESTRICT ON DELETE CASCADE		
role_id	bigint(20)	UNSIGNED	No			-> roles.id ON UPDATE RESTRICT ON DELETE CASCADE		

24 sessions

Creation: Dec 15, 2022 at 04:48 PM
Last update: Jun 12, 2023 at 01:32 PM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
id	varchar(255)		No					
user_id	bigint(20)	UNSIGNED	Yes	NULL				
ip_address	varchar(45)		Yes	NULL				
user_agent	text		Yes	NULL				
payload	longtext		No					
last_activity	int(11)		No					

25 socialite_users

Creation: Mar 30, 2023 at 11:14 PM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
id	bigint(20)	UNSIGNED	No		auto_increment			
user_id	bigint(20)	UNSIGNED	No					
provider	varchar(255)		No					
provider_id	varchar(255)		No					
created_at	timestamp		Yes	NULL				
updated_at	timestamp		Yes	NULL				

26 taggables

Creation: May 14, 2023 at 09:48 PM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
tag_id	bigint(20)	UNSIGNED	No			-> tags.id ON UPDATE RESTRICT ON DELETE CASCADE		
taggable_type	varchar(255)		No					
taggable_id	bigint(20)	UNSIGNED	No					

27 tags

Creation: May 14, 2023 at 09:48 PM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
id	bigint(20)	UNSIGNED	No		auto_increment			
name	longtext		No					
slug	longtext		No					
type	varchar(255)		Yes	NULL				
order_column	int(11)		Yes	NULL				
created_at	timestamp		Yes	NULL				
updated_at	timestamp		Yes	NULL				

28 topicables

Creation: Jan 20, 2023 at 12:38 AM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
id	bigint(20)	UNSIGNED	No		auto_increment			
topic_id	bigint(20)	UNSIGNED	Yes	NULL		-> topics.id ON UPDATE RESTRICT ON DELETE CASCADE		
topicable_id	int(10)	UNSIGNED	No					
topicable_type	varchar(255)		No					
created_at	timestamp		Yes	NULL				
updated_at	timestamp		Yes	NULL				

29 topics

Creation: Jan 20, 2023 at 12:38 AM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
id	bigint(20)	UNSIGNED	No		auto_increment			
name	varchar(255)		No					
slug	varchar(255)		No					
parent_id	bigint(20)	UNSIGNED	Yes	NULL			-> topics.id ON UPDATE RESTRICT ON DELETE SET_NULL	
is_active	tinyint(1)		No	1				
created_at	timestamp		Yes	NULL				
updated_at	timestamp		Yes	NULL				
deleted_at	timestamp		Yes	NULL				

30 users

Creation: Mar 30, 2023 at 11:15 PM

Column	Type	Attributes	Null	Default	Extra	Links to	Comments	MIME
id	bigint(20)	UNSIGNED	No		auto_increment			
name	varchar(255)		No					
email	varchar(255)		No					
email_verified_at	timestamp		Yes	NULL				
password	varchar(255)		Yes	NULL				
two_factor_secret	text		Yes	NULL				
two_factor_recovery_codes	text		Yes	NULL				
two_factor_confirmed_at	timestamp		Yes	NULL				
remember_token	varchar(100)		Yes	NULL				
current_team_id	bigint(20)	UNSIGNED	Yes	NULL				
profile_photo_path	varchar(2048)		Yes	NULL				
created_at	timestamp		Yes	NULL				
updated_at	timestamp		Yes	NULL				
google_id	varchar(255)		Yes	NULL				

