

**Digital Artisan Marketplace: Empowering Local Artists with a Digital Art E-commerce
Platform**

BY
HO CO AI

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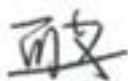
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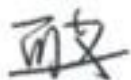
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ABSTRACT

In today's digital era, the intersection of technology and creativity provides opportunities for artisans to showcase and monetize their digital artworks. This project aims to develop an e-commerce platform that not only facilitates the buying and selling of digital art but also empowers local artisans by providing them a space to showcase their creativity. The significance of this project is to make an academic contribution to the field of business information by addressing the growing demand for digital platforms that fits to the needs of niche markets, such as local artists. By using e-commerce technology, this platform enables artists to overcome traditional barriers to entry into the global marketplace, including limited access to marketing resources.

In the art world, on the other hand, traditionally artworks have mainly been created by hand by artists. Recently artworks using digital technology have become widely recognized [1]. Digital art consumption is on the rise and online marketplaces are becoming increasingly important, the development of a specialized e-commerce platform for artists is timely and important. Ultimately, "Digital Artisan Marketplace" seek to empower artists, promote cultural diversity, and contribute to the vibrant ecosystem of digital creativity in the modern era.

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Chapter 1

Introduction

In this chapter, we are going to discover the background and motivation of our research, the problem statement, research objectives, project scope and direction, contributions, and the details of this research.

1.1 Problem Statement and Motivation

The arise of the digital era has revolutionized the way art is created, shared, and consumed, presenting both opportunities and challenges for local artists. Besides, e-commerce platform growing effectively, and it offer users to communicate dynamically at any time and place [2]. Therefore, with the popularize of digital media, artists are increasingly turning to digital platforms to showcase and monetize their creations. However, despite the growing popularity of digital platforms among artists, many users face significant challenges in leveraging dedicated online platform to showcase, sell or buy digital artworks [3].

- **Limited visibility into delivery status**

In today's digital marketplace, users often find themselves facing problems with lack of real-time tracking and updates on the delivery status of their purchased digital artworks. This deficiency in transparency leaves them feeling dissatisfied, as they are unable to monitor the progress of their purchases.

- **Concerns regarding intellectual property protection**

Digital artists face challenges in protecting their intellectual property rights. The lack of effective legal protections provides opportunities for infringement of digital copyright, leading to endless copyright issues [4]. Although the rise of online platforms has opened opportunities for artists to share and monetize their creations, but it has also exposed them to the threat of unauthorized reproduction and distribution. Without robust mechanisms in place to safeguard their work, artists are left vulnerable to piracy.

- **Limited engagement and interaction between individuals**

Despite the boundless potential of digital connectivity, users are often faced with barriers when it comes to bringing up meaningful interactions and engagement with others. The inability to purchase and send digital artworks as gifts to others represents a significant gap in the user experience [5]. Without the feature to facilitate communication and interaction within the platform, users are left feeling disconnected.

Considering these issues, the motivation behind this project is rooted in the recognition of the transformative potential of an e-commerce platform for artists specializing in digital artwork [6]. By addressing the identified issues head-on, this project seeks to provide artists with a dedicated space to showcase their creativity while ensuring the protection of their intellectual property rights. Through the development of an intuitive and user-friendly e-commerce platform, this project aims to democratize the process of monetizing digital creations, thereby enabling artists to unlock new opportunities for growth and recognition in the digital age. Ultimately, the motivation behind this project is driven by a commitment to bridging the gap between artists and their audience, advancing a community of digital creators, and contributing to the evolution of the digital art landscape.

1.2 Objectives

The objectives of this projects are

1. To enable users to track in delivery process.

Enhance transparency and accountability during the order fulfilment process. Users are empowered to check on the delivery status of their purchases in real-time. Ensure that the digital artworks reach their intended recipients promptly and securely.

2. To protect the intellectual property rights of artists.

Integrate robust intellectual property protection mechanism such as watermarking and digital rights management (DRM), to prevent unauthorized reproduction and distribution of digital artworks. Develop copyright verification systems to authenticate the legitimacy of artists' creations, safeguarding their creative integrity and financial interests.

3. To enable users to send digital artworks as thoughtful gifts to others.

Introduce interactive features such as gifting options and customizable messages, to empower users to send digital artworks as thoughtful gifts to their loved ones. Simplified the gifting process to enable users to effortlessly send digital artworks to others.

1.3 Project Scope and Direction

This proposed project will be separated into different modules.

- **User Management Module**

This module enables users to register and log in. It gives users the ability to manage their personal information with ease, including details such as phone numbers, and email addresses. Other than that, the module should enable users with a comprehensive view of their purchase history, enabling them to track past transactions and manage their accounts efficiency.

- **Product Management Module**

The product management module enables admins to control the products effectively. Through this module, admins can seamlessly add, delete, and manage the products according to their categories. The product will be separated into 3 main categories of digital art, which is art, photography, and 3D modelling art [7]. Key functionalities include edit product description, flexible pricing adjustment, and inventory management tools.

- **Security and Intellectual Property Module**

The security module serves as the backbone of the e-commerce platform, ensuring the confidentiality of user data and transactions. Key functionalities include data encryption, secure login, and stringent access controls. Besides, the module prioritizes the protection of artists' intellectual property rights by implementing measures to prevent illegally reproduced or distributed without proper authorization.

- **Tracking Module**

The tracking module enhances transparency and accountability in the order fulfilment process. Users are empowered to check on the delivery status of their purchases in real-time. When the email is delivered to the recipient's inbox, the module should notify the sender. If the email fails to send, the module should also notify the sender. Therefore, it can ensure that they reach their intended recipient in a timely manner.

- **Gifting Module**

The gifting module introduces a personalized touch to the e-commerce platform, allowing users to send digital artworks as thoughtful gifts to friends and loved ones. With features such as customizable messages, the module allows users to effortlessly send digital artworks, ensuring that the gifts are received. This module adds a layer of sentimentality to the shopping experience, facilitating meaningful connections between users and recipients.

1.4 Contributions

The main contribution of this proposed project involves developing an e-commerce website specifically for artisans, providing a dedicated platform to showcase and sell digital artworks. Within this context, the project aims to help artisans in monetizing their digital creations and reaching a wider audience. The project aims to enhance user satisfaction by improving the visibility of delivery status within the e-commerce platform. Acknowledging the significance of keeping users informed about the details of their orders, the platform implements advanced tracking mechanisms to provide real-time updates on the delivery progress.

Furthermore, one significant contribution of the project involves the development and implementation of a robust security module designed to protect the intellectual property rights of artists within the e-commerce platform. By integrating measures such as watermarking and digital rights management (DRM), the platform ensures that artists' creations are safeguarded against unauthorized reproduction and distribution [8]. By adding watermarks into digital artworks, the platform adds an extra layer of protection against potential infringers. The robust security measures implemented within the platform not only protect the intellectual property rights of artists but also uphold the integrity and value of digital artworks in online commerce.

Besides, the project introduces innovative features such as gifting module, enabling users to send digital artworks as thoughtful gifts to others. Through this module, users can write customizable messages and schedule gift deliveries at specific dates and times, ensuring that gifts are received at the perfect moment. This feature enhances the emotional connection between gift senders and recipients, enriching the overall user experience and fostering a sense of appreciation for the gifted digital artworks. By providing this innovative feature, this project can set itself apart from other existing similar websites and offer a more attractive service to users. Overall, the project offers a transformative solution to the challenges faced by local artisans in monetizing their digital creations, while also enhancing the shopping experience for users and fostering meaningful interactions within the digital art of community.

1.5 Report Organization

This report is organized into 6 chapters: Chapter 1 Introduction, Chapter 2 Literature Review, Chapter 3 System Design, Chapter 4 System Implementation and Testing, Chapter 5 System Outcome and Discussion, Chapter 6 Conclusion. The first chapter is the introduction of this project which includes problem statement, project background and motivation, project scope, project objectives, project contribution, highlights of project achievements, and report organization. In Chapter 2, a comprehensive literature review is undertaken, delving into the e-commerce landscape with a focus on prominent entities such as Etsy, DeviantArt, ArtStation, and Dribbble. This chapter culminates in a comparative analysis of these four existing systems.

Shifting to Chapter 3, the proposed methodology and approach are elaborated, commencing with the system design diagram, such as use case diagram and activity diagram. The fourth chapter is regarding the details on the design of the system. Furthermore, the fifth chapter reports the system implementation. This phase entails the hardware and software setup, settings, and the details of system operation. Progressing to Chapter 6, the system evaluation and discussion is reported, and the performance of the system will be tested. Lastly, Chapter 7 encapsulates the project's conclusion, with the findings, insights, and implications garnered throughout the research journey.

Chapter 2

Literature Reviews

This chapter will focus more on existing online digital artworks e-commerce website such as Etsy, DeviantArt, ArtStation, and Dribbble. The similar existing systems will be reviewed based on their functionalities and different modules, strengths, and weaknesses.

2.1 Etsy [9]

Etsy is a well-known online marketplace that allows artists, including digital artists, to sell their creations. It primarily focuses on handmade and vintage items, as shown in Figure 2.1. It also features a wide range of digital artworks such as prints, illustrations, and digital downloads, as shown in Figure 2.2. Besides, the ratings of each product will be shown. Through categories feature that Etsy provides, users are able to directly find the category of products that they are interested in. Users can favourite items and add them to their cart if they are willing to purchase. When purchasing products, users do not need to register a user's account for this site. When purchasing digital products, users need to fill in the email address, full name, and street address, as shown in Figure 2.3. Before proceeding to payment, users can choose the payment method and review the order. Based on Figure 2.4, the website will show the order summary for the user. If user registers an account for this site, they can manage personal information, view their purchase history to download the digital artworks and reviews, communicate with the seller, find special offers or discount, join the marketplace, and open shop.

However, there are good and bad points to every online platform. This website does not allow customers to purchase products as a gift for others. Customers are also unable to send a customized message to their recipients.

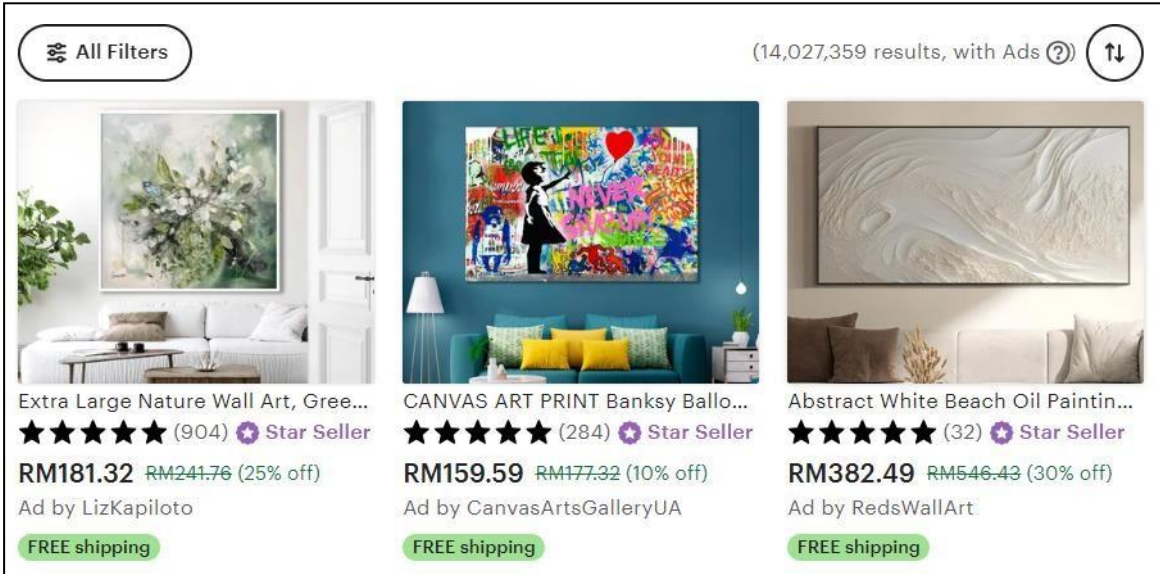


Figure 2.1 Handmade and Vintage Items

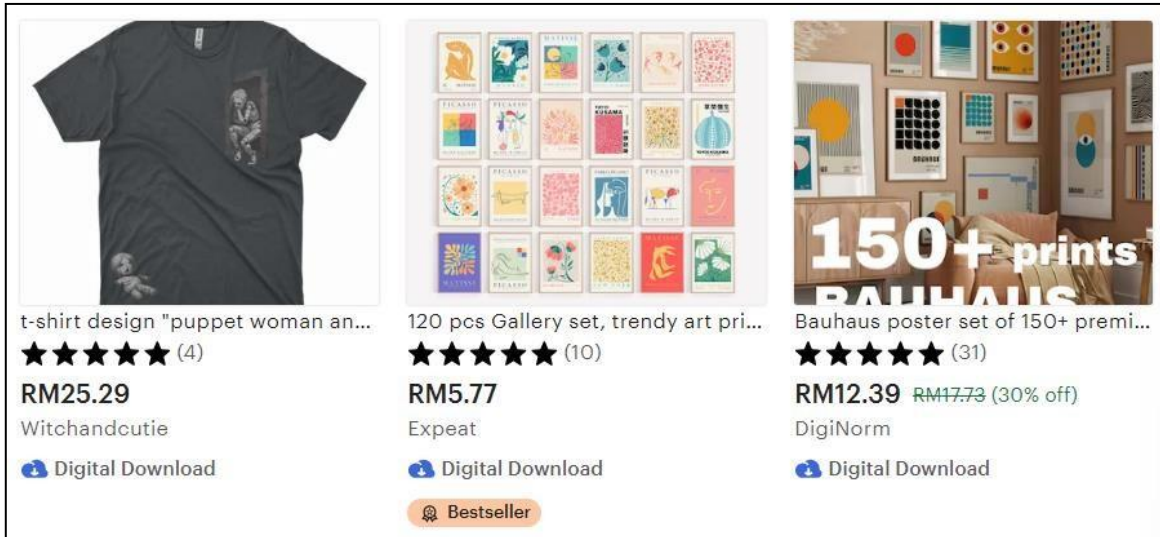


Figure 2.2 Digital Artworks

Enter your shipping address

Email *

Confirm email *

Country *

Malaysia ▼

Full name *

Street address *

Apt / Suite / Other (optional)

Postal code *

City *

State (optional)

Select state ▼

Phone number (optional)

Continue to payment

Figure 2.3 Shipping Detail

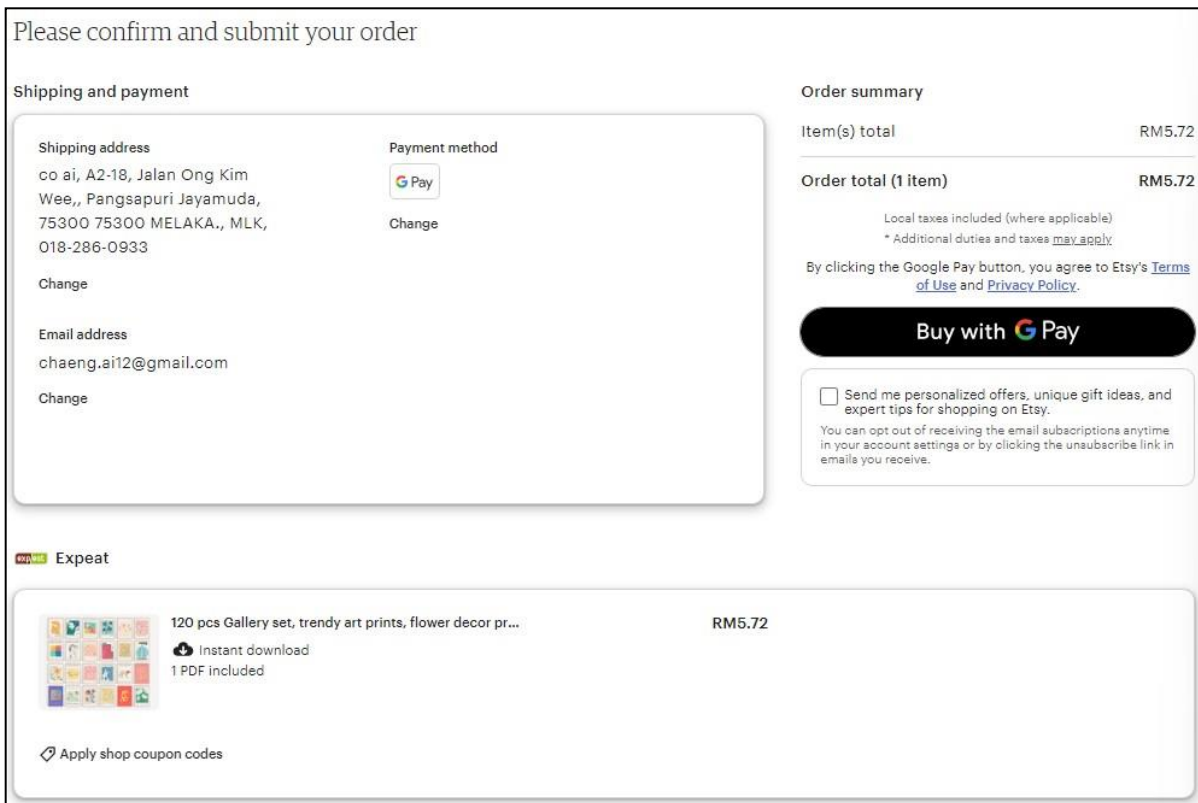


Figure 2.4 Order Summary

Strengths:

1. Offers a categories feature for users to easily navigate and find products.
2. Not requiring users to register an account for purchasing.
3. Able to view ratings and reviews.

Weaknesses:

1. Unable to send digital artworks as thoughtful gifts to others.
2. Unable to send a customized message to recipient.

2.2 DeviantArt [10]

DeviantArt serves as both a social networking platform and an online community for artists to showcase their artwork. While its primary focus is not e-commerce, it does offer artists the opportunity to sell prints and digital downloads of their creations directly through the site. Users can engage with the artworks that they like by sharing them on social media platforms, as shown in Figure 2.5. Additionally, based on Figure 2.6, users have the option to purchase and download artworks they desire. Before completing a purchase, DeviantArt protect the intellectual property rights of artists by adding watermarks to digital artworks.

However, to access all features and functions, users are required to register an account on the site. Besides, customers have the ability to show appreciation for artists by sending them gifts, as demonstrated in Figure 2.7. In DeviantArt, there are some free downloadable content that do not require any payment [11]. For premium content, users can purchase and download the artworks but are currently unable to send them as gifts to others directly within the site's interface.

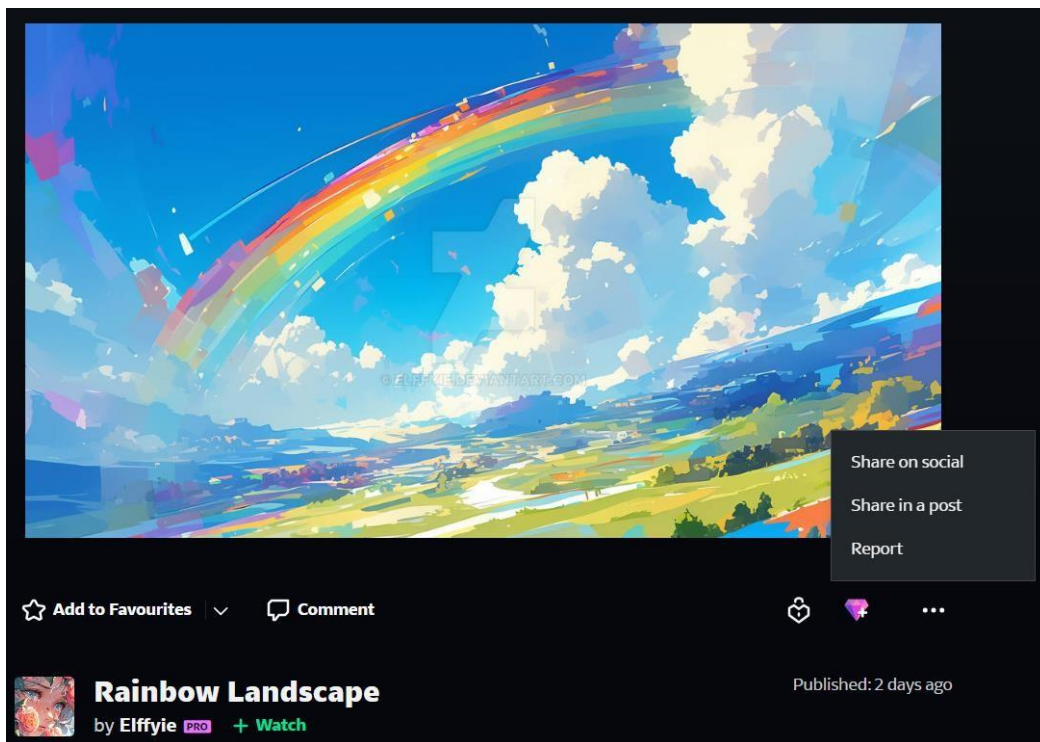


Figure 2.5 Sharing Feature

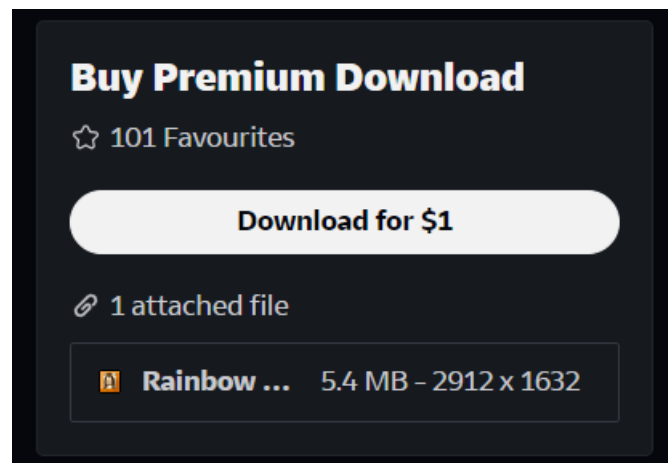


Figure 2.6 Purchase and Download

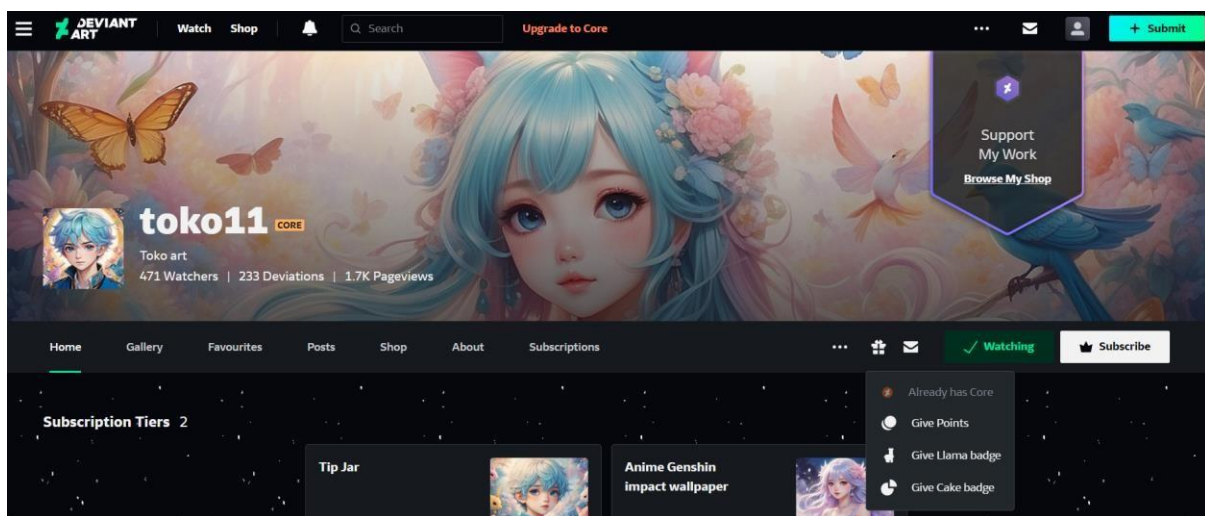


Figure 2.7 Send Gifts to Artist

Strengths:

1. Protect the intellectual property rights of artists by adding watermark.
2. Able to share the artworks with social media.

Weaknesses:

1. Unable to send digital artworks as thoughtful gifts to others.
2. Unable to customize messages to recipients.
3. All functions required the user to register an account.

2.3 ArtStation [12]

ArtStation functions primarily as a professional networking platform for artists within the entertainment industry, including digital artists, concept artists, and illustrators. While its primary focus on showcasing portfolios and facilitating connections with job opportunities, it also serves as a marketplace where artists can sell prints and digital downloads of their artwork directly to customers, as shown in Figure 2.8. Based on Figure 2.9, ArtStation offers the flexibility for artists to sell their artworks under both standard and commercial licenses, catering to diverse usage scenarios.

Moreover, users have the option to support artists by providing additional tips, thereby fostering a culture of appreciation and support within the community. However, to purchase digital artworks, users are required to register an account on ArtStation's platform. It's important to note that ArtStation has a unique delivery method for digital files, as files are not sent via email. Instead, users receive a temporary download link accessible through their ArtStation Library [13]. Despite these strengths, ArtStation currently lacks a feature to purchase gifts for others through its platform, representing a potential limitation for users seeking to share the joy of artwork with their peers and loved ones.

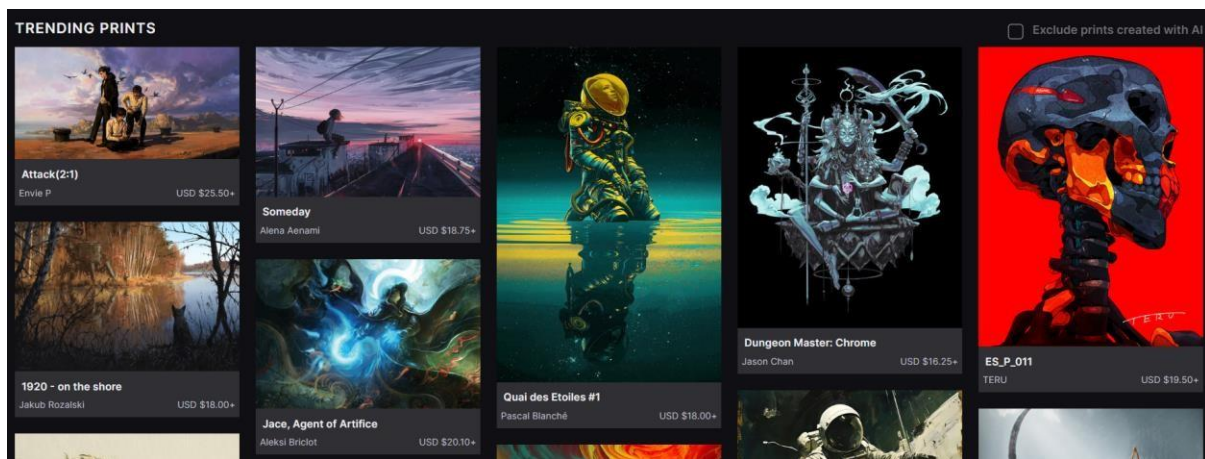


Figure 2.8 Prints and Digital Downloads

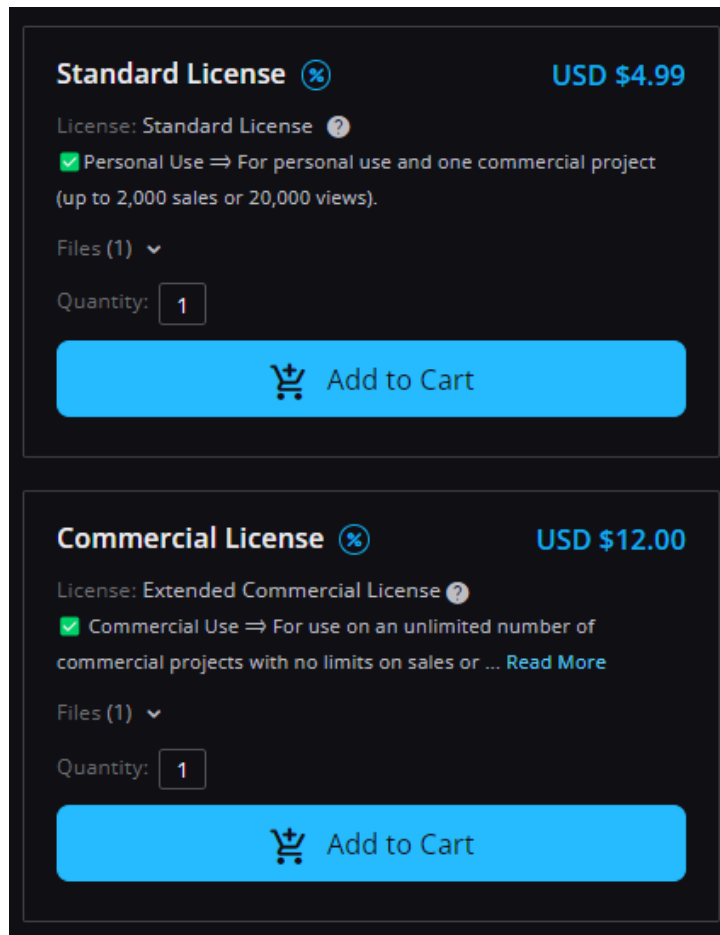


Figure 2.9 Standard License and Commercial License

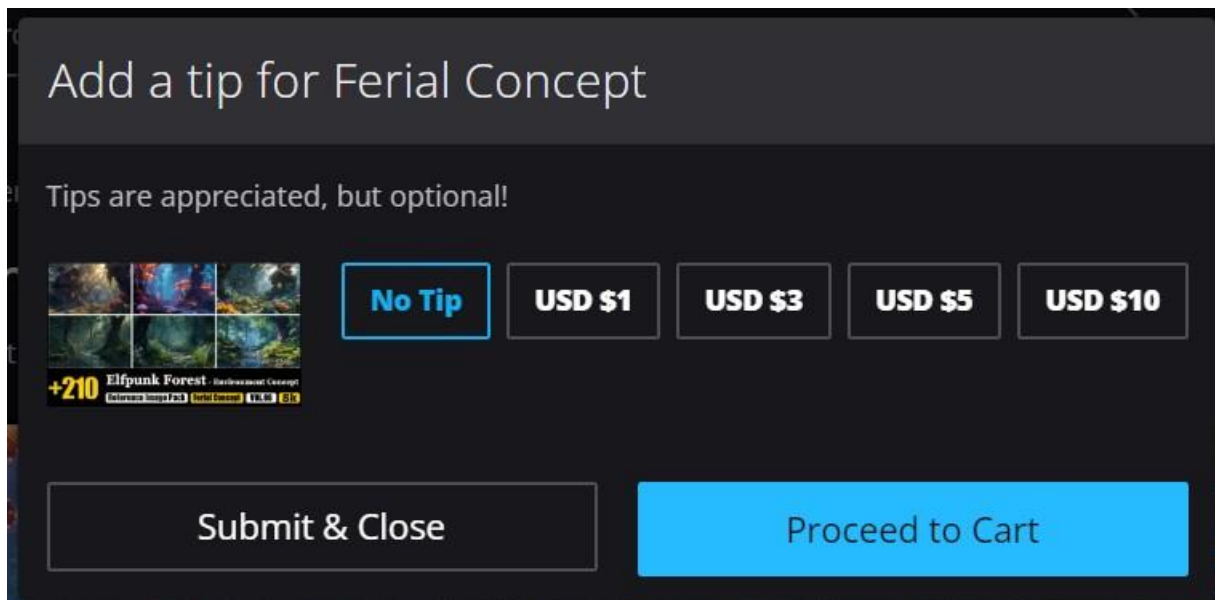


Figure 2.10 Additional Tips for Artist

Strengths:

1. Simple and user-friendly interface.
2. Ability to contact the seller.
3. Option to choose standard or commercial licenses.

Weaknesses:

1. Unable to send digital artworks as thoughtful gifts to others.
2. Lack of ability to customize messages to recipients.
3. All functions required the user to register an account.

2.4 Dribbble [14]

Dribbble serves as a platform for designers, illustrators, and creatives to showcase their work and connect with potential clients or collaborators. While its primary focus lies in design and illustration rather than fine art, the platform prioritizes assisting artists in reaching a broader audience and expanding their opportunities within the creative industry.

To fully using Dribbble's features, users are required to register an account, granting access to various functionalities. Users can share artworks that they like on social media platforms like Pinterest and Twitter, fostering broader exposure for artists' creations. Additionally, users have the option to like and save artworks to their personal collections. One feature of Dribbble is the ability for users to connect directly with artists for potential collaboration opportunities. Through messaging functionality, users can reach out to artists to express interest in projects or designs they admire, as shown in Figure 2.11. However, it's important to note that Dribbble is not based on commercial purpose, therefore, there is no protection of artists' intellectual property rights, as shown in Figure 2.12. The platform serves primarily as a showcase for artists to display their drawing styles.

Unfortunately, Dribbble does not provide features for gift sending or customized messages to others. These functionalities are not within the platform's scope, which may limit its appeal for users seeking personalized interactions or gifting options.

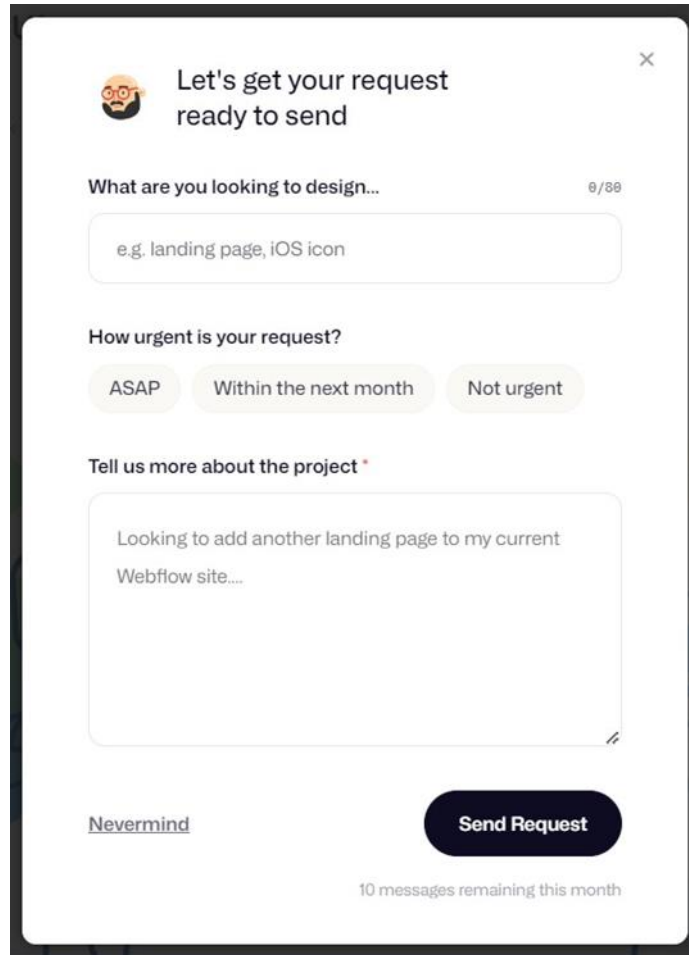


Figure 2.11 Messaging Functionality

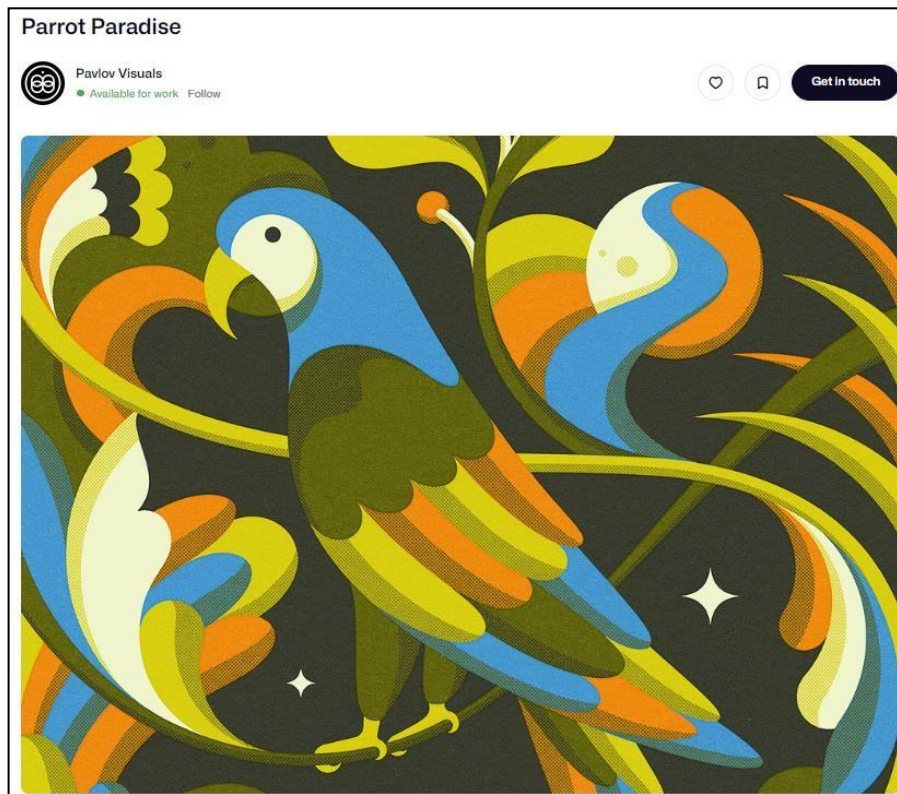


Figure 2.12 Lack of Intellectual Property Protection

Strengths:

1. Able to like and save the artworks into own collection.
2. Able to contact the artists.
3. Able to share the artworks with social media.

Weaknesses:

1. Unable to send digital artworks as thoughtful gifts to others.
2. Unable to customize messages to recipients.
3. There is no protection of artists' intellectual property rights.
4. All functions required the user to register an account.

2.5 Comparison between Existing System and Proposed System

	Etsy	DeviantArt	ArtStation	Dribbble	Proposed Website
Offer free artworks	x	✓	✓	✓	✓
Add to cart feature	✓	x	✓	x	✓
Timely notifications upon delivery confirmation	✓	x	✓	x	✓
Gifting feature	x	x	x	x	✓
Customized message feature	x	x	x	x	✓
Protection of artists' intellectual property rights	x	✓	x	x	✓

Tabele 2.5 Comparison between Existing System and Proposed System

2.6 Proposed System

After reviewing the important feature of e-commerce platform for digital artworks, and the strengths and weaknesses of each similar existing website. A website will be proposed with the following features:

1. User Authentication: Customers can register and sign in to the mobile application.
2. User Profile Management: Creation and management of user profiles, encompassing personal information such as phone number, date of birth and shipping addresses.
3. Search Functionality: An efficient search feature allowing customers to find desired items.
4. Menu Navigation: User-friendly navigation through the application's menu and main categories of products.
5. Shopping Cart: Management of selected items in the shopping cart.
6. Order Placement: Facilitation of the order placement process.
7. Order Status Tracking: Access to the real time status of orders.
8. Gifting Functionality: Able to send items as a gift to others with a customized message.

Chapter 3

System Methodology/Approach OR System Model

The project's processes were organized into distinct phases throughout its development lifecycle.

3.1 Project Methodology

A methodology is proposed to ensure that this project is developed at a sustainable rate and finished on schedule.

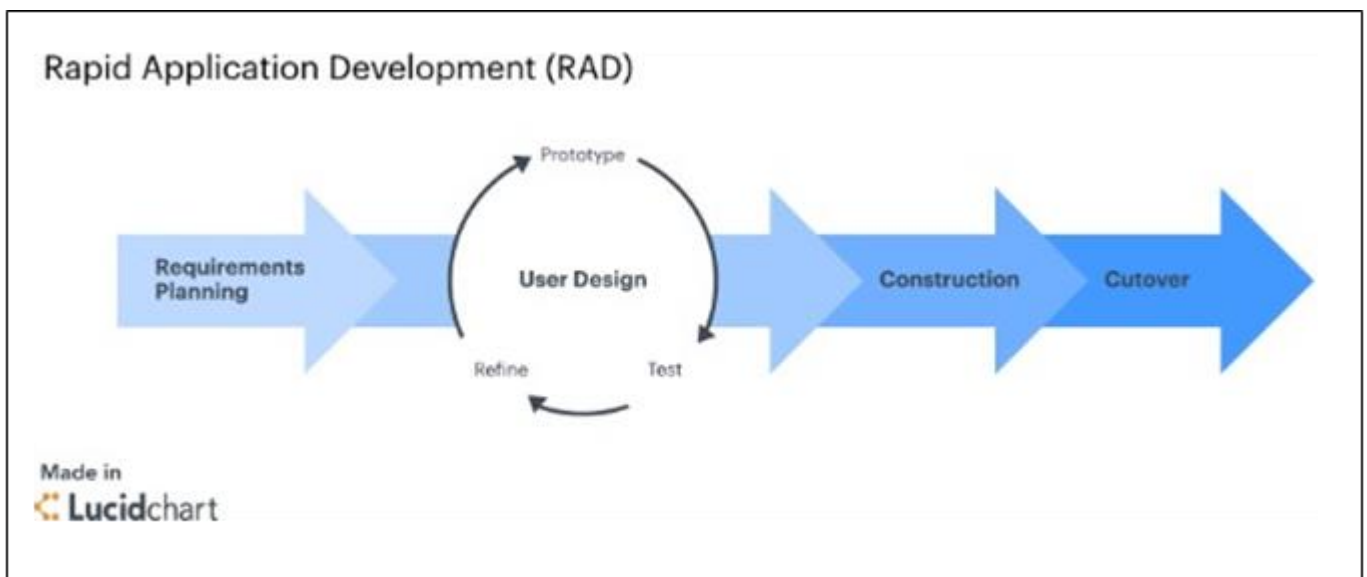


Figure 3.1 Rapid Application Development

Source: <https://www.lucidchart.com/blog/rapid-application-development-methodology>

The main advantage of the Rapid Application Development (RAD) approach lies in its ability to facilitate quick project turnaround, making it an attractive option for professionals operating in fast-paced environments such as software development. This approach leads to greater efficiency, accelerated development cycles, and improved communication among stakeholders. While RAD typically follows four primary steps, the process can be further segmented or customized to suit specific project requirements.

3.1.1 Phase 1 - Planning Phase

During this phase, the initial requisites are gathered and researching the project background is the first step. After that, establish the problem statement, define the project's scope, and formulate the project objectives. Next, a selection will be made among comparable existing applications for the purpose of evaluation, aiming to pinpoint their strengths and weaknesses. By dissecting these attributes, the project scope and project objectives for the proposed endeavour will be crystallized.

3.1.2 Phase 2 - Design Phase

Transitioning to the design stage, the system's specifications will be defined, UML diagrams will be crafted, and an overarching system architecture will be outlined. The prototype's development will then commence, employing an incremental development approach. User feedback will be sought to refine the module functionalities and enhance the overall system design. This iterative process will be reiterated if the prototype falls short of specific requirements, thereby evolving the prototype across multiple iterations.

3.1.3 Phase 3 - Implementation Phase

The remaining system functionalities will be progressively developed and integrated to culminate in a comprehensive application during the implementation phase.

3.1.4 Phase 4 - Testing and Maintenance Phase

After the development stage, the application progresses to the testing phase. Functional testing is conducted to verify that all classes collaborate seamlessly without errors. Additionally, performance testing is performed to assess the application's efficiency under various conditions. Once testing is completed and the application is deemed stable, it is ready for launch. The application is then distributed to users, who provide feedback on its usability and performance. Concurrently, feedback from users is collected and recorded for maintenance purposes. During the maintenance stage, periodic upgrades are made to enhance the system's functionality and address any issues or bugs that may arise. Maintenance activities are carried out systematically to ensure the continued smooth operation of the application and to meet evolving user needs.

3.2 Technology Involved

3.2.1 Hardware

The hardware involved in this project is only a computer. Computers can quickly read, create and maintain a successful website.

Table 3.2 Specifications of laptop

Description	Specifications
Model	MSI GF63 Thin 9SCXR
Processor	Intel(R) Core(TM) i7-9750H CPU @ 2.60GHz 2.60 GHz
Operating System	Windows 11
Graphic	NVIDIA GEFORCE GTX
Memory	16.0 GB RAM
Storage	1TB

3.2.2 Software

To ensure that the proposed project able to run seamlessly, there are some software components that need to install and download on the device.

PHP Programming Language



Figure 3.2.2.1 Logo of PHP Programming Language

Figure 3.2.2.1 shows the logo of PHP, a widely-used open-source general-purpose scripting language highly esteemed for web development [15]. PHP, which stands for Hypertext Preprocessor, is acclaimed for its versatility and efficiency in crafting dynamic and interactive web pages. Within this project, PHP serves as the primary programming language, providing a sturdy and scalable framework for dynamic web application development.

Java Script



Figure 3.2.2.2 Logo of JavaScript Programming Language

Figure 3.2.2.2 displays the logo of JavaScript, a programming language predominantly utilized for web development. JavaScript is celebrated for its capacity to produce dynamic and interactive web pages, facilitating the implementation of intricate features that enhance user experience and interactivity on the web [16]. Within this project, JavaScript assumes a pivotal role in crafting client-side functionalities, facilitating the seamless integration of interactive elements and dynamic content within web applications. Given its widespread adoption and vast array of libraries and frameworks, JavaScript stands as an indispensable tool for contemporary web development.

CSS



Figure 3.2.2.3 Logo of Cascading Style Sheets

CSS, short for Cascading Style Sheets, is a cornerstone technology employed alongside HTML and JavaScript to elevate the visual presentation and layout of web pages. It empowers developers to specify the style, appearance, and formatting of HTML elements, thereby enabling the creation of visually striking and well-organized websites [17]. Within this project, CSS assumes the responsibility of defining the aesthetic components of the user interface, encompassing aspects such as colors, fonts, layout, and responsiveness. Through the utilization of CSS, developers can craft immersive and visually compelling web experiences that captivate users and enhance the overall caliber of the web application.

PhpMyAdmin



Figure 3.2.2.4 Logo of phpMyAdmin

phpMyAdmin stands as an open-source administration tool utilized for managing MySQL and MariaDB databases. It furnishes database administrators with a user-friendly interface to undertake a spectrum of tasks, spanning database creation, management, and maintenance [18]. Leveraging its intuitive graphical user interface (GUI), phpMyAdmin streamlines database administration endeavors, enabling users to execute SQL queries, import and export data, and manage database users and privileges with efficiency. Within this project, phpMyAdmin assumes a pivotal role as a valuable asset for database management and administration. Its integration empowers developers to interact seamlessly with databases, thereby facilitating the development of robust and scalable web applications.

3.3 System Design Diagram / Equation

3.3.1 Use Case Diagram

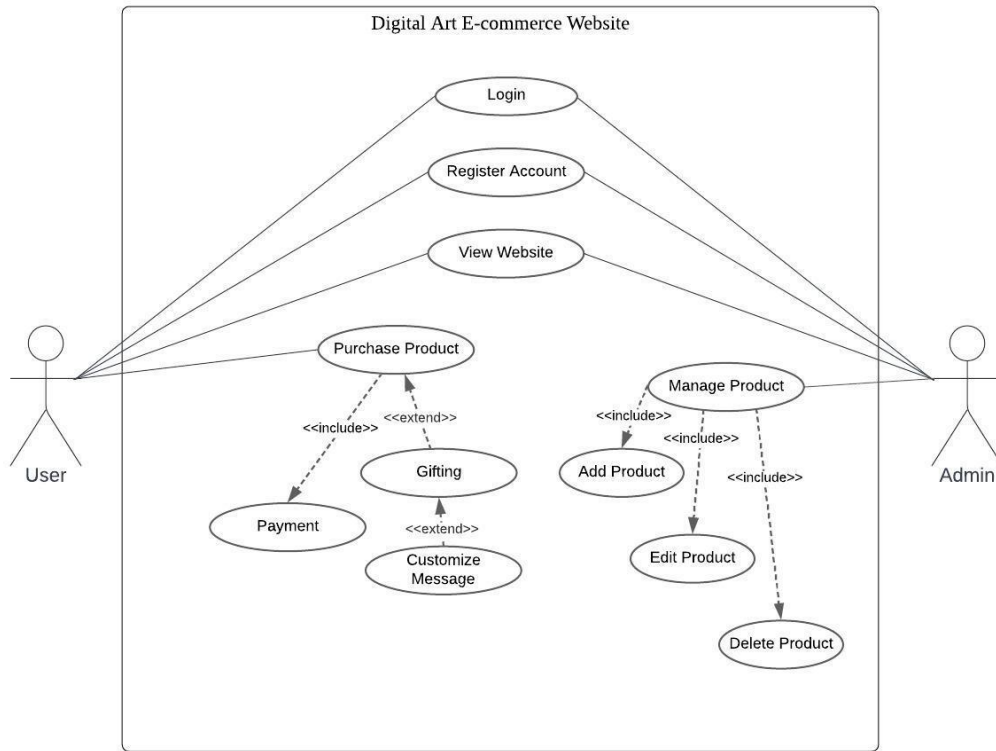


Figure 3.3.1 Use case diagram of Digital Artwork E-commerce Website

Based on the use case diagram provided, users have the ability to carry out several fundamental actions on the website, including logging in, registering new accounts, and browsing products. They can also make purchases for themselves or others, with the option to include a personalized message if they're sending a gift. Upon proceeding to checkout, users will initiate the payment process.

On the administrative side, the admin oversees product management tasks such as adding, editing, and deleting digital artworks from the website. This involves uploading new artworks along with detailed descriptions categorized appropriately.

3.3.2 Use Case Description

Table 3.3.2.1 Login – Use Case Description

Use Case Name	Login
Purpose	To enable user to login their account
Actor	User
Normal Flow of Events	<ol style="list-style-type: none"> 1. The user inputs their email or username along with the correct password. 2. System will check the validity of the inputs. 3. If the input is valid, the system will proceed to the user's main page.
Alternate Flows	If the user clicks the "Sign Up" button, the system will redirect the user to the account registration page.

Table 3.3.2.2 Register Account – Use Case Description

Use Case Name	Register Account
Purpose	To enable new user to create an account
Actor	User
Normal Flow of Events	<ol style="list-style-type: none"> 1. The user fills in the required information, including name, date of birth, email address, and phone number. 2. The provided information will be stored in the database system. 3. After the creation successful, the system will direct the user to main page.
Alternate Flows	-

Table 3.3.2.3 Purchase Product – Use Case Description

Use Case Name	Purchase Product
Purpose	To enable user to select a digital artwork for purchasing.
Actor	User
Normal Flow of Events	<p>The system will display the different type of artwork on the display.</p> <p>When user select a digital artwork and click on purchase. System will show the selected digital artwork detail in the new page.</p> <p>If the user clicks on the “Purchase for myself” button.</p> <ol style="list-style-type: none"> 1. User will need to fill in the address details such as name, and email address. 2. User click “Done” button and proceed to payment process. 3. User fill in the payment details. 4. System generates an email notification to the user when the product is sent. 5. User receives an email containing the digital artwork. 6. User can view their purchase history in their account.
Alternate Flows	<p>If the user clicks on the “Purchase as a gift” button.</p> <p>Then, the system will also enable the sender to customize messages that will send to the recipient before moving to the payment process.</p> <p>User will need to fill in the details such as the name of sender and recipient and their email address.</p>

Table 3.3.2.4 Manage Product – Use Case Description

Use Case Name	Manage Product
Purpose	To enable admin to add, edit, or delete products for users to view.
Actor	Admin
Normal Flow of Events	<p>Admin logs into the admin site and proceed to the “ManageProduct” site.</p> <p>When admin wants to add a new artwork</p> <ol style="list-style-type: none"> 1. Admin needs to upload the new artwork and add description for the products based on the category. <p>When admin wants to update an existing artwork</p> <ol style="list-style-type: none"> 1. Admin clicks on the “Edit” button on the selected artwork. 2. System will show the information detail of the selected artwork. 3. Admin can modify and save the new details. <p>When admin wants to delete an existing artwork</p> <ol style="list-style-type: none"> 1. Admin clicks on the “Delete” button on the selected artwork. 2. The system removes the selected artwork from the website. <p>After making changes, the changes will be saved, changed and added to the website.</p>
Alternate Flows	-

3.3.3 Activity Diagram

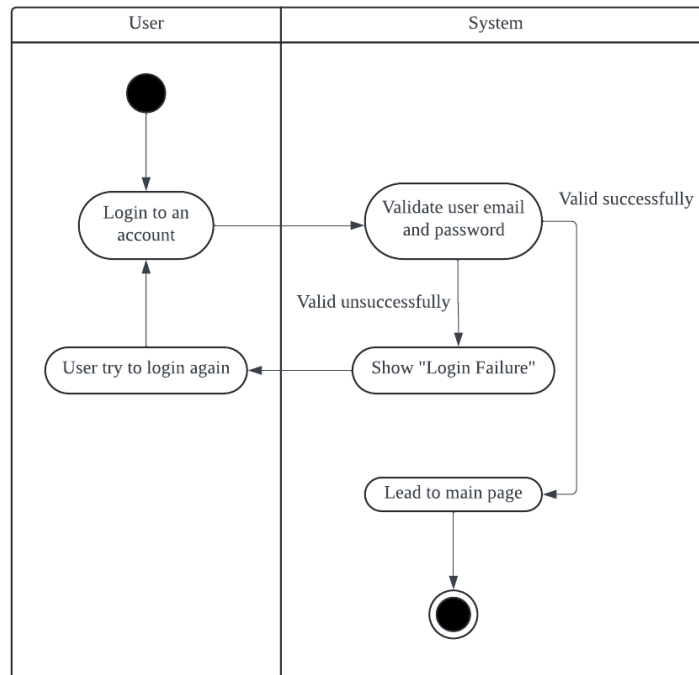


Figure 3.3.3.1 Login - Activity Diagram

The activity diagram shows the login process flow. Initially, upon accessing the system, the user encounters the login screen, where they input their credentials. Subsequently, the system verifies the user's email and password combination. If incorrect information is entered, the system displays a "Login Failure" message in a small window, permitting the user to retry the login process.

Upon successful validation of the email address and password, the system directs the user to the main page of the website.

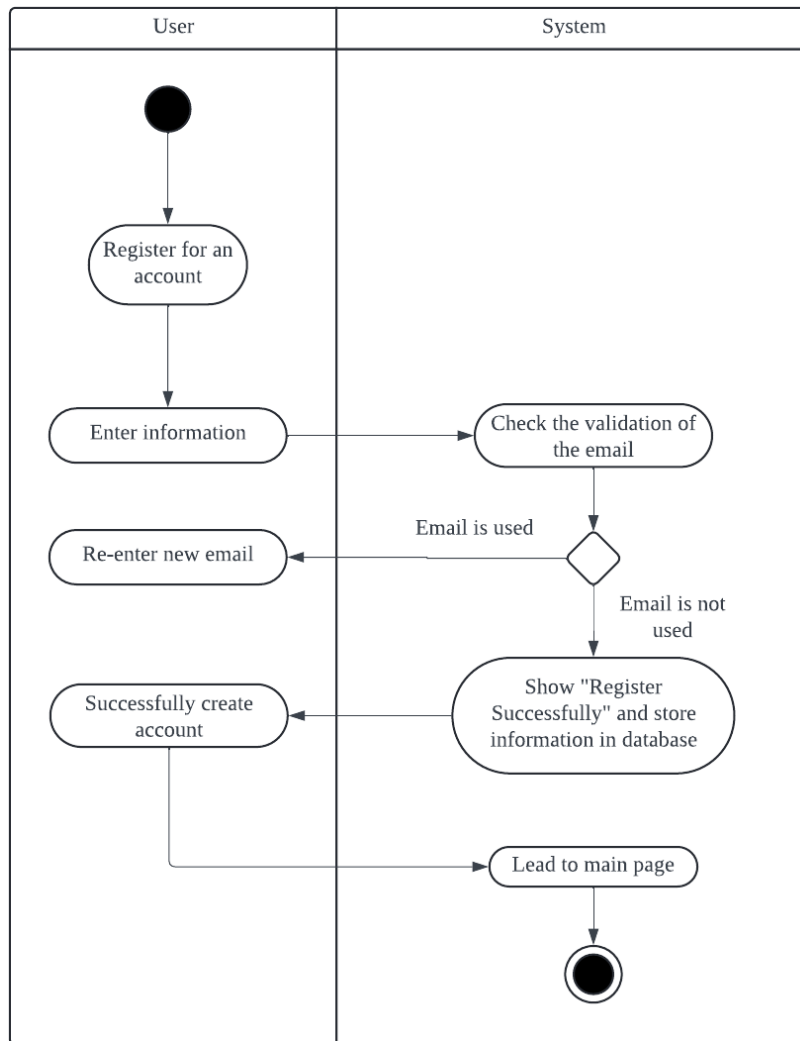


Figure 3.3.3.2 Register Account – Activity Diagram

The activity diagram illustrates the user account registration process. When a user initiates account creation, they are required to input their email address, password, username, and contact information. The system proceeds to verify and validate the provided email address. If the email address is already associated with an existing account, the user is prompted to provide an alternative email address.

If the email address is available and not in use, the system proceeds to create a new account and displays a "Register Successful" message to the user. Subsequently, the account details, including the provided information, are saved in the database for future reference and use.

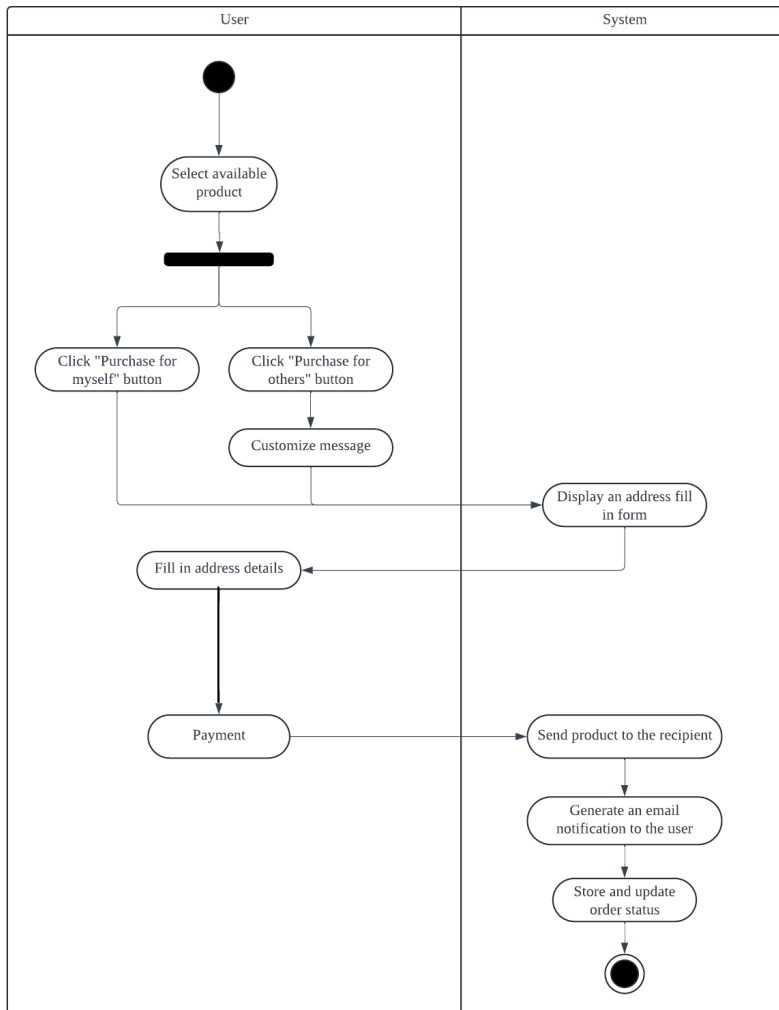


Figure 3.3.3.3 Purchase Product – Activity Diagram

The activity diagram outlines the purchase process. Initially, the user selects an available product from the menu. If the user wants to send the artwork as a gift to others, they can opt for the "Purchase for others" option. Following this selection, the user has the opportunity to include a personalized message for the recipient.

Once the message is added, the system prompts the user to fill in the recipient's address details via an address form. Subsequently, the user proceeds to the payment process to complete the transaction. Upon successful payment, the system arranges for the product to be sent to the recipient according to the specified delivery date and time. Additionally, the system generates an email notification to the user to confirm the purchase and provide further details regarding the delivery.

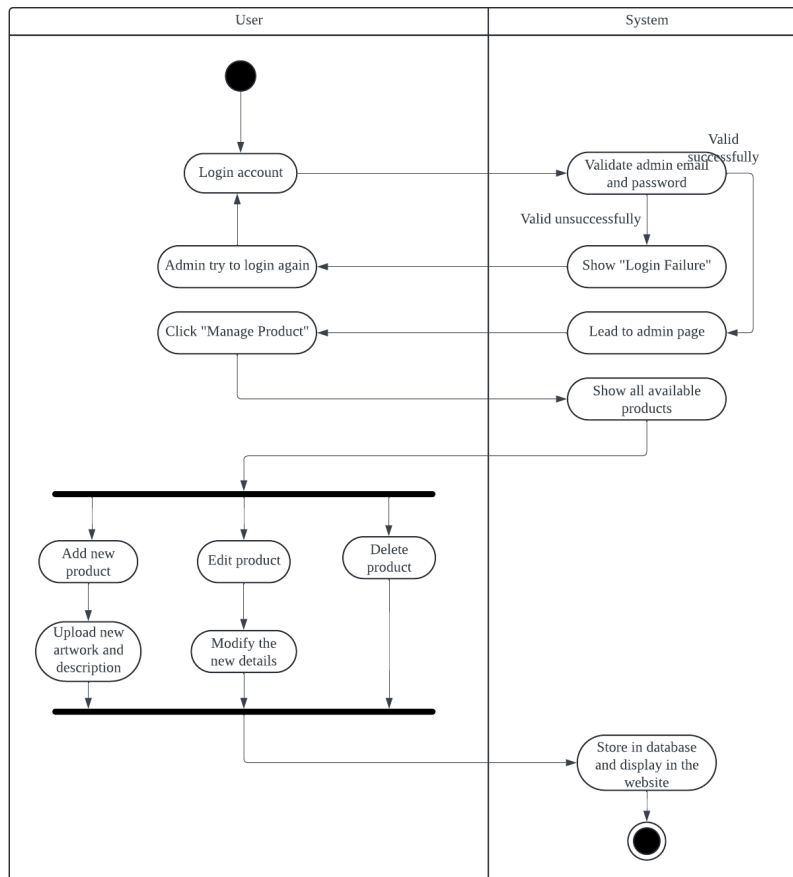


Figure 3.3.3.4 Manage Product – Activity Diagram

The workflow outlines the process for the admin to manage products on the website. Initially, the admin must log in to the admin page and navigate to the "Manage Product" section. Here, they will be presented with a list of all available products, and they can perform actions such as adding, editing, or deleting products.

When adding a new product, the admin clicks the "Add" button, uploads the artwork, and provides a description for the product based on its category. To edit an existing product, the admin selects the "Edit" button and modifies the details of the chosen product. Similarly, the admin can delete a product by clicking the "Delete" button.

After making any changes, the webpage is updated to reflect the modifications made by the system, ensuring that the product management process is seamless and efficient.

3.3.4 Entity Relationship Diagram

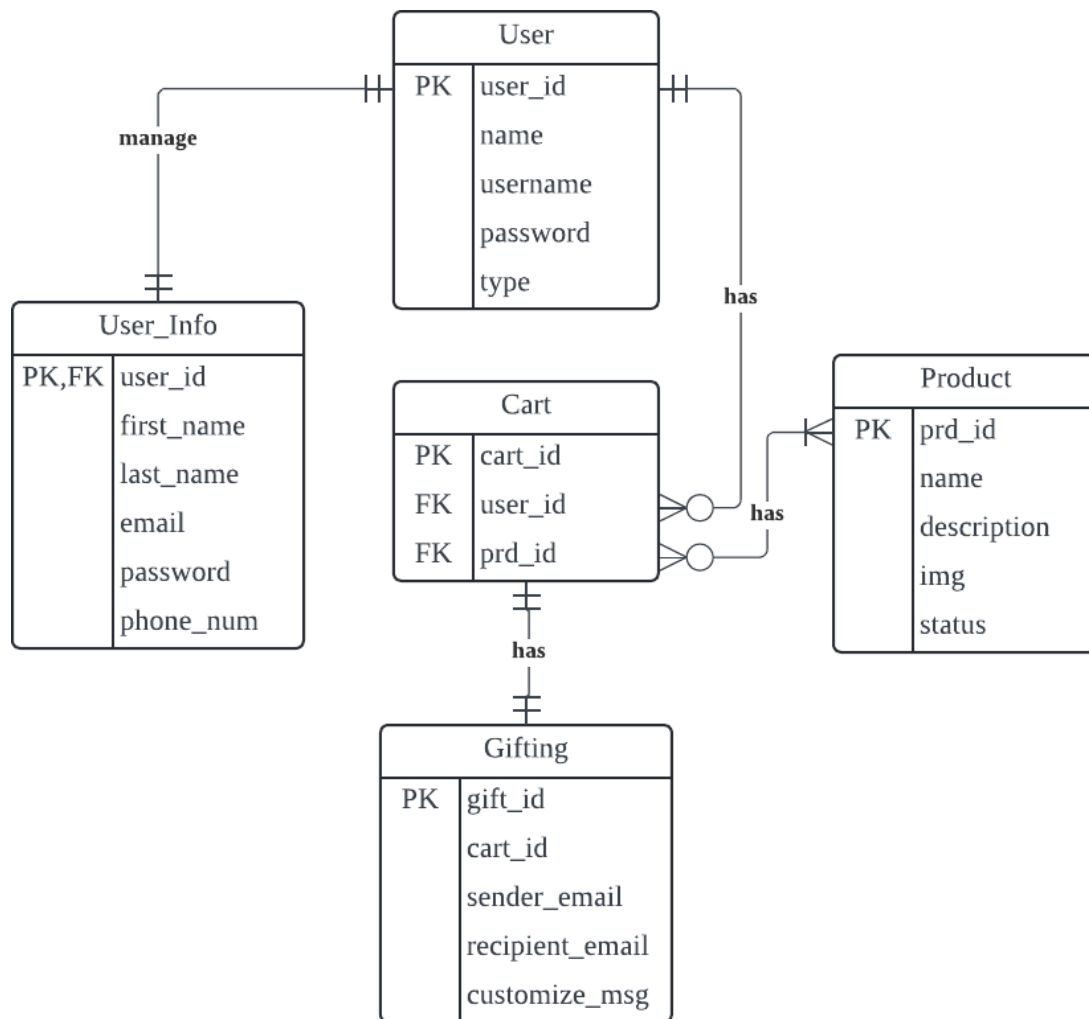


Figure 3.3.4 Entity Relationship Diagram

The entity relationship diagram (ERD) illustrates the key entities and their relationships within the proposed website's scope. It comprises five entity tables. The 'user' table is for authentication and access control purposes on the admin site, ensuring that only authorized users can access and perform specific actions on the site. Each user manages their own account, implying a one-to-one relationship between users and their accounts. The 'user_info' table is for storing additional personal information such as name, email address, password, and phone number. This table is associated with the User table, likely through a one-to-one relationship, as each user has only one set of personal information.

The 'product' table stores the information of the digital artwork, such as product name, description, image and the status of the product. Each cart can contain one to many products, and a product can be added into zero to many carts. Besides, each user can have zero to more carts, but each cart is associated to one user only. Once the user has added the products into the cart, the system will send the products with the information and customized messages that stored in the 'gifting' table.

Entity: User

Table 3.3.4.1 User Entity

Attribute	Description	Data Type	PF/FK	Null
user_id	A unique identification for users	int	PK	-
name	User name	varchar		-
username	Username	text		-
password	User password	varchar		-
type	User type (admin or user)	tinyint		-

Entity: User_Info

Table 3.3.4.2 User Information Entity

Attribute	Description	Data Type	PF/FK	Null
user_id	A unique identification for users	int	PK&FK	-
first_name	User first name	varchar		-
last_name	User last name	varchar		-
email	User email address	varchar		-
password	User password	varchar		-
phone_num	User phone number	varchar		-

Entity: Product

Table 3.3.4.3 Product Entity

Attribute	Description	Data Type	PF/FK	Null
prd_id	A unique identification for products	int	PK	-
name	Product name	text		-
description	Product description	text		-
img	Product image	text		-
status	Product status	tinyint		-

Entity: Cart

Table 3.3.4.4 Cart Entity

Attribute	Description	Data Type	PF/FK	Null
cart_id	A unique identification for cart	int	PK	-
user_id	A unique identification for user	int	FK	-
prd_id	A unique identification for product	int		-

Entity: Gifting

Table 3.3.4.5 Gifting Entity

Attribute	Description	Data Type	PF/FK	Null
gift_id	A unique identification for gifting	int	PK	-
cart_id	A unique identification for cart	int	FK	-
sender_email	Email address of sender	text		-
recipient_email	Email address of recipient	text		-
customize_msg	Customized message	text		-

3.4 Timeline

Activity	Period													
	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14
CHAPTER 1 - Introduction														
Problem Statement and Objective	█													
Research Objectives, Scope and Direction	█													
Contributions	█													
CHAPTER 2 – Literature Review														
Review on Similar Website		█	█											
Comparison			█											
CHAPTER 3 – Proposed Method/Approach														
Project Methodology				█										
System Requirement				█										
CHAPTER 4 - Conclusion														
Design Prototype					█	█	█	█	█	█	█	█	█	
Finalize FYP 1 Report												█	█	

Figure 3.4.1 FYP 1's Gantt Chart

Activity	Period													
	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14
Development Phase														
Module Development	█	█	█	█	█	█	█							
Development Issues and Fixing	█	█	█	█	█	█	█							
Implementation Phase														
Deliver to User and Collect Feedback								█						
Enhance System								█	█	█				
System Testing									█	█	█	█		
Evaluation Phase														
Evaluate System											█	█	█	
Enhancement											█	█	█	
Finalize and Submission														█

Figure 3.4.2 FYP 2's Gantt Chart

Chapter 4

System Design

4.1 Site Map

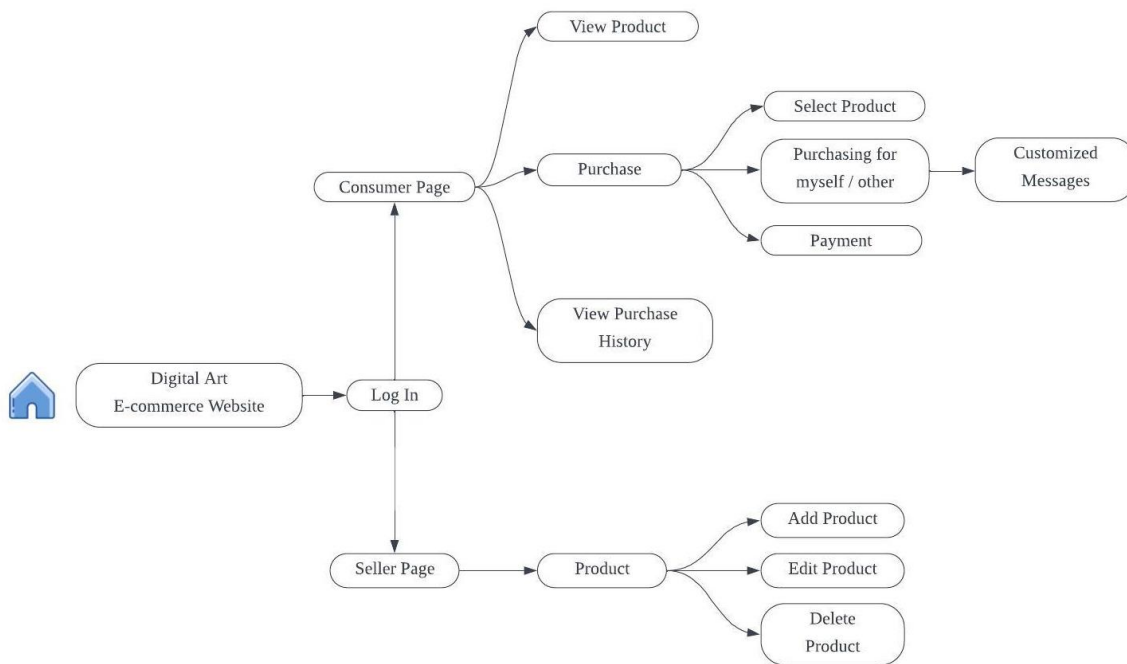


Figure 4.1 Site Map of Digital Artwork E-commerce Website

The site map is a visual representation of the website's structure and content, showcasing both main and sub-pages along with their respective URLs. When entering the website, users are required to log in using their existing account. Once logged in, users will be led to the consumer page or seller page based on their account. On the consumer page, users can view and purchase products, as well as review their purchase history. Meanwhile, the seller page offers access to features geared towards product management. Here, sellers can browse a list of available products, add new products, and make edits or deletions as necessary.

4.2 Block Diagram

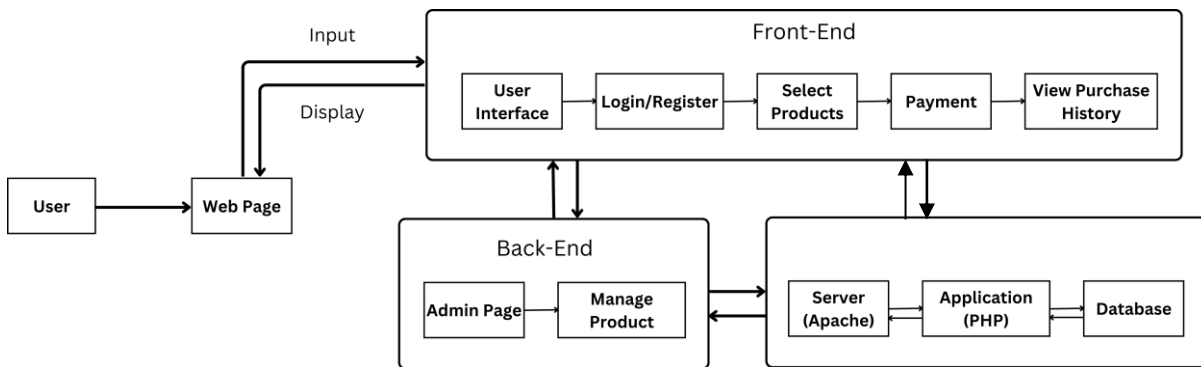


Figure 4.2 Block Diagram of Digital Artwork E-commerce Website

In the proposed website, the front-end is used to handle the interactions with the user through the web page, while the back-end manages the server processing and data storage. Communication between the front-end and back-end occurs through HTTP requests and responses.

The User Interface in the block diagram represents the front-end, including the web browser and user interactions with the site. Besides, the back-end consists of the web server (Apache), application server (PHP), and database (MySQL).

When a user interacts with the website, the browser sends HTTP requests to the web server, which forward the requests to the application server for processing. The application server generates the response, which is then sent back to the web server and displayed to the user in the browser. On the admin page, requests made by the admin will be handled by the web server and application server. The admin can manage products by adding new products, deleting existing ones and updating product details. The PHP application server processes these actions and communicates with the web server to generate the correct responses. After that, the responses will be displayed by the web server. The database server stores all data related to user accounts and products, and the PHP application server interacts with the database to retrieve and update data based on the user actions.

4.3 System Components Specifications

The proposed digital artwork e-commerce website should be able to fulfill the requirement of the user and consist of different functions and features.

1. Authentication System

The authentication system serves as an important role in ensuring secure access for both users and admins. It allows them to log in with their unique email and password, verifying their identity before getting access to the platform's features. This system also manages data access levels, ensuring users can only view or interact with the content they are authorized to access. On the other hand, admins have the ability to manage products and user activities securely.

2. Database

MySQL is employed as the database system, acts as a cloud-hosted solution that securely stores all user and product data. The database provides real-time data synchronization and ensure that user have access to the newest information on products and user details. This real-time update function enhances the user experience.

3. User Interface

The website's user interface is using modern UI development frameworks to create a seamless browsing experience. The interface is easy to navigate, allowing users to go through menus and features easily. It provides quick access to all essential features such as product search, adding items to the cart, managing user profiles, and viewing purchase history, ensuring a satisfying user journey.

4. Product Management

Admin able to manage the website's product catalog. Admins can add new products, delete outdated or unavailable items, and update product details such as descriptions, prices, or availability. These changes are reflected instantly on the website, ensuring that users always have the latest information when browsing the products.

5. Search Function

The search function is an essential tool for users. It allows users to quickly search the products they are interested in. This feature uses a robust search algorithm integrated with the database to provide real-time, accurate search results. Users can effectively find and engage with the products based on their interests. This immediate access to information will increase user satisfaction.

6. Add to Cart

The add-to-cart feature allows users to select and store products they are interested in purchasing. Instead of checking out products one by one, this feature enables users to add multiple items to a shopping cart and purchase them all together. It simplifies the purchasing process and improves the overall user experience by making it more efficient and less time-consuming.

7. Gifting function

The gifting function allows users to send products as gifts to others. Users can add a personalized message with their gift, enhancing the emotional and sentimental value of their purchase. This feature facilitates meaningful connections between users and their friends or loved ones, adding a special layer of personalization to the shopping experience.

8. History Tracking

The history tracking feature keeps a detailed record of all purchases made by users. This functionality allows users to review their past transactions, which is convenient for tracking orders, managing receipts, or simply revisiting previously bought products. Users can easily access their purchase history from the dashboard.

9. Payment: PayPal Integration

The website will integrate PayPal for payment processing, utilizing a PayPal sandbox account for testing purposes. PayPal offers a secure and reliable payment solution, ensuring that all transactions are conducted safely. By integrating PayPal, the system can offer users a range of payment options, including credit card transactions and PayPal credits. This variety enhances flexibility and convenience for users, providing them with multiple ways to complete their purchases securely.

10. Protection of Intellectual Property

To protect artists' intellectual property, the system will incorporate watermarking on digital artwork. This ensures that the content remains protected from unauthorized use or duplication, preserving the artist's rights. By using watermarks, the system helps maintain user trust and security, assuring both buyers and sellers that their data and intellectual property are safeguarded. This measure reinforces the website's commitment to upholding the legal rights of artists and ensuring the integrity of the artwork displayed on the platform.

Chapter 5

System Implementation

5.1 Hardware Setup

The hardware that involve in this project is only a computer. To ensure the performance and functionality of the proposed system, there are certain hardware setup are recommended for user devices. The following are the minimum requirements:

1. Processor: Intel® Pentium® 4 or AMD Athlon® 64 processor

The processor must be capable of handling the website's functionality, including managing multiple tasks simultaneously and ensuring smooth performance during product browsing, searching, and payment processing.

2. RAM: 4 GB or more

A minimum of 4 GB of RAM is necessary to ensure smooth navigation and interaction with the website. More RAM is recommended for better multitasking and faster website loading times, especially when handling complex functions such as image loading, searching, and payment processing.

3. Hard-Disk Space: 3GB of available hard disk space minimum

Sufficient storage is required for installing software components and files related to the website, ensuring smooth operation. Users should have at least 3 GB of available hard disk space for this purpose.

4. Display: 1200 x 800 display with 16-bit graphics card

A display resolution of 1200 x 800 pixels is recommended for optimal viewing of the website's content, including high-quality images of artwork and clear text. A 16-bit graphics card ensures that users can enjoy a visually appealing experience with the correct color depth and rendering of images.

5.2 Software Setup

To ensure the users able to access and interact with the digital artwork e-commerce website, it is important to set up the necessary software components. Below are the recommended software requirements:

1. Web Browser:

Users need a modern web browser to access the website and ensure compatibility with all the website's features. We recommend using browsers such as **Google Chrome, Microsoft Edge, and Mozilla Firefox**. These browsers offer full support for the latest web technologies and provide a smooth browsing experience.

2. Local Web Server:

For development and testing purposes, a local web server is needed to host and serve the website. We recommend using **XAMPP**, which includes Apache, MySQL, and PHP. This all-in-one package simplifies the setup process, allowing developers to easily run the website locally on their computer.

3. Source Code:

To work with the website, developers will need to download the source code in a zip file format. The source code contains all necessary files and scripts for the Digital Artwork E-commerce Website. After downloading, developers can extract the files and begin development or customization as needed.

4. Database:

The website uses a MySQL database for managing user and product data. We recommend using **PHPMyAdmin**, a web-based administration tool that simplifies the management of MySQL databases. After starting the local web server, you can access PHPMyAdmin by visiting <http://localhost/phpmyadmin>, where you can create, modify, or manage the database.

5. Text Editor or Integrated Development Environment (IDE):

Developers will need a text editor or IDE to modify and customize the source code of the website. We recommend using **Visual Studio Code**, a powerful and user-friendly IDE with features such as syntax highlighting and debugging to enhance the development process.

Once all these software components are correctly installed and configured, users can easily access and interact with the website by navigating to it via their chosen web browser.

5.3 Setting and Configuration

To access the Digital Artwork E-commerce Website, users need to configure the software components correctly. Below are the detailed guidelines on how to set up the necessary components.

Setting Up XAMPP:

- Download XAMPP from the official website <https://www.apachefriends.org/download.html>. After the download finished, double click the downloaded installer to start the installation.

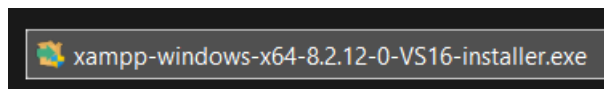


Figure 5.1 XAMPP Installation Guide

- Choose a location to install XAMPP. Then, click “Next” until it starts to install.

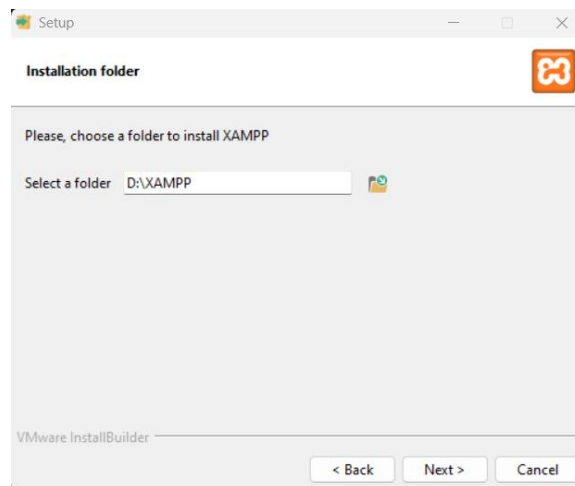


Figure 5.2 XAMPP Installation Guide

- After successfully install, open the XAMPP Control Panel.

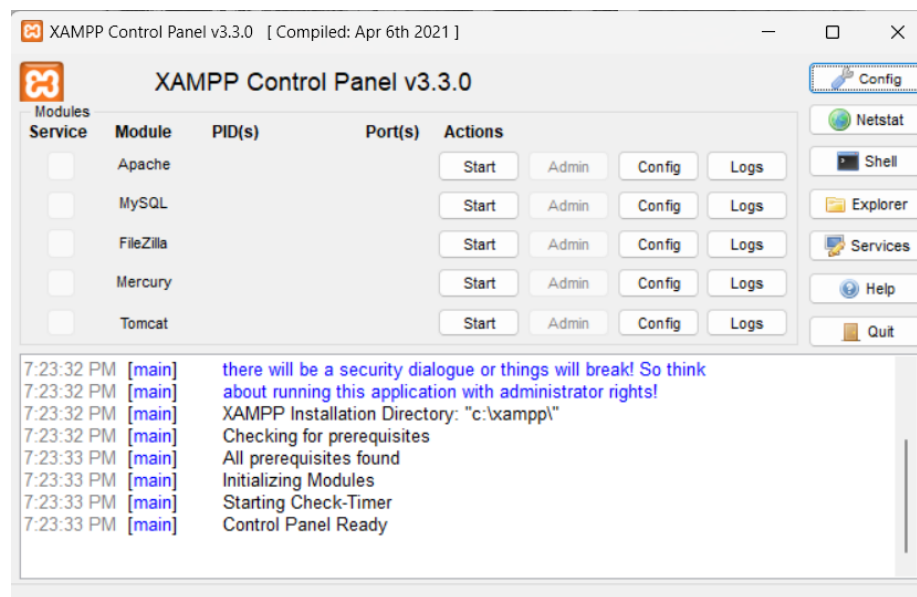


Figure 5.3 XAMPP Control Panel

- Start both Apache and MySQL services.

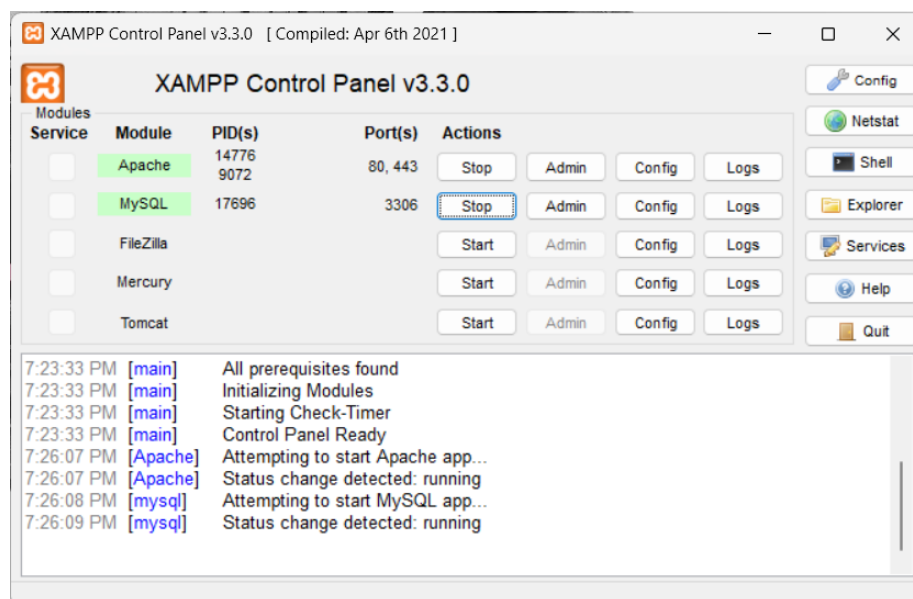


Figure 5.4 XAMPP Control Panel

Setting Up Website Source Code:

- Download the provided source code zip file for the website and extract it to a file location of your choice.
- Copy the source code to XAMPP's "htdocs" directory (e.g., C:\xampp\htdocs). This directory serves as the web server's root folder.

Database Configuration:

- Open a web browser and navigate to <http://localhost/phpmyadmin>.
- In PHPMyAdmin, click on “Database”. Under the “Create database” tab, enter “ecommerceweb” and click “Create”.



Figure 5.5 Create Database

- After the database created successfully, click on “Import” and import the SQL file named “ecommerceweb.sql”, which is located in the database folder of the extracted source code.

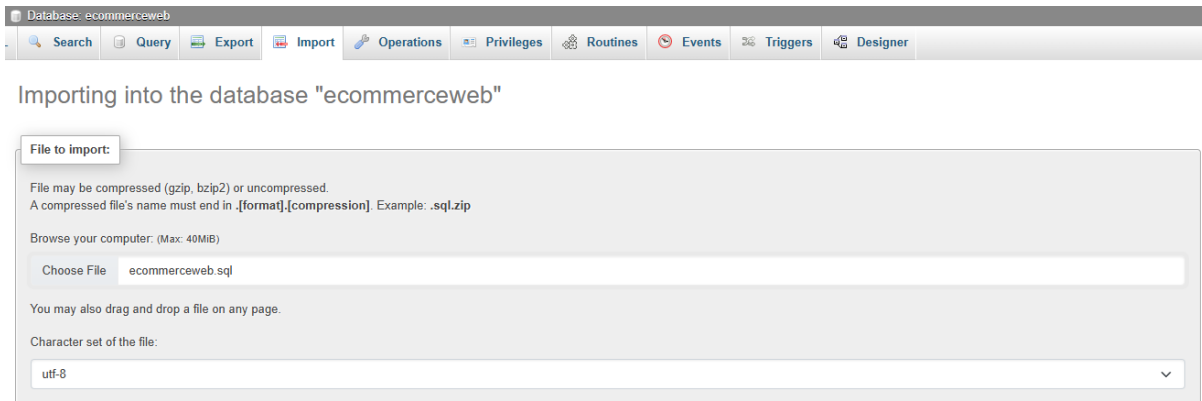


Figure 5.6 Import SQL File

Setting Up Mail Function:

- Open “php.ini” file which is located at XAMPP’s “php” directory (e.g., C:\xampp\php).

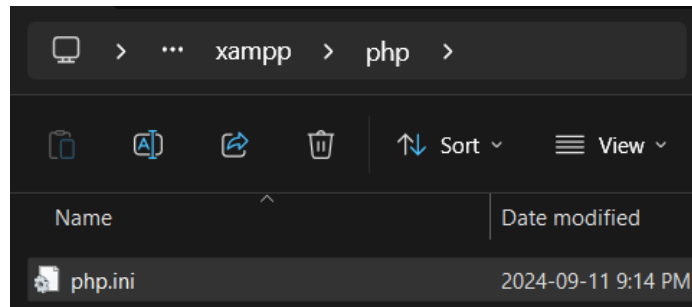


Figure 5.7 Mail Function

- Modify these four lines under the mail function settings.

```
[mail function]
; For win32 only.
; https://php.net/smtp
SMTP=smtp.gmail.com
smtp_port=587
sendmail_from = smiley.artecommerce@gmail.com
sendmail_path = "C:\xampp\sendmail\sendmail.exe -t"
```

Figure 5.8 Mail Function

- After that, open “sendmail.ini” file which is located at XAMPP’s “sendmail” directory (e.g., C:\xampp\sendmail).

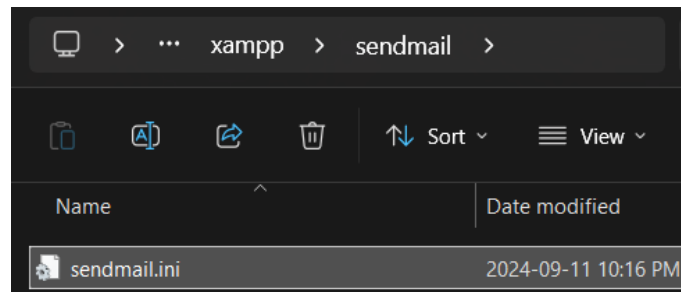


Figure 5.9 Mail Function

- Modify these lines to ensure that the mail function able to run.

```
smtp_server=smtp.gmail.com
smtp_port=587
smtp_ssl=tls
auth_username=smiley.artecommerce@gmail.com
auth_password=tfip ejsm jaaf dsvf
from=smiley.artecommerce@gmail.com
```

Figure 5.10 Mail Function

Accessing the Digital Artwork E-commerce Website:

- Open a web browser and go to <http://localhost/Smiley/index.php>.
- You will be direct to the main page of the website as a customer.
- You can login as an admin by going to <http://localhost/Smiley/admin/login.php>.

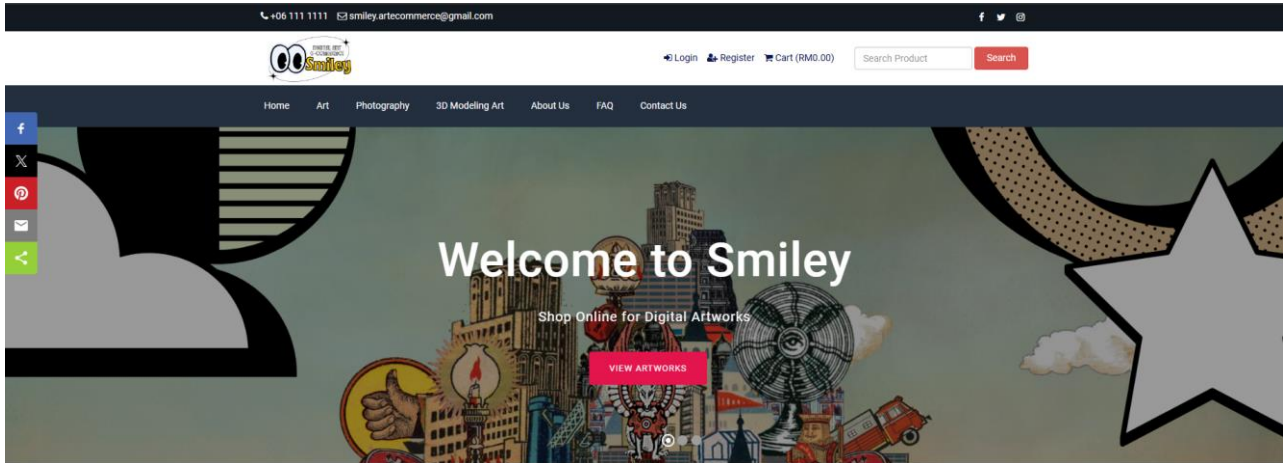
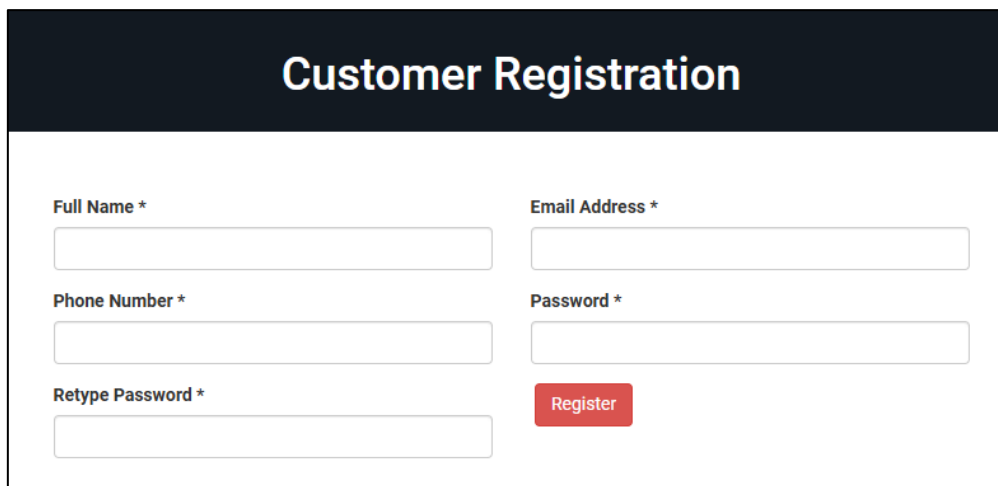


Figure 5.11 Main Page

5.4 System Operation

Log In Page

Firstly, users must log in to the "Smiley" website to purchase any product. If they are new users, they are required to register for a new account. If they're new to the site, they'll need to register by providing their full name, email address, phone number, address, and creating a password. This data will be securely stored in Firebase, guaranteeing the confidentiality and security of user information (Figure 5.4.1).



The image shows a registration form titled "Customer Registration" in a dark header. The form contains five input fields: "Full Name *", "Email Address *", "Phone Number *", "Password *", and "Retype Password *". A red "Register" button is positioned to the right of the "Retype Password" field.

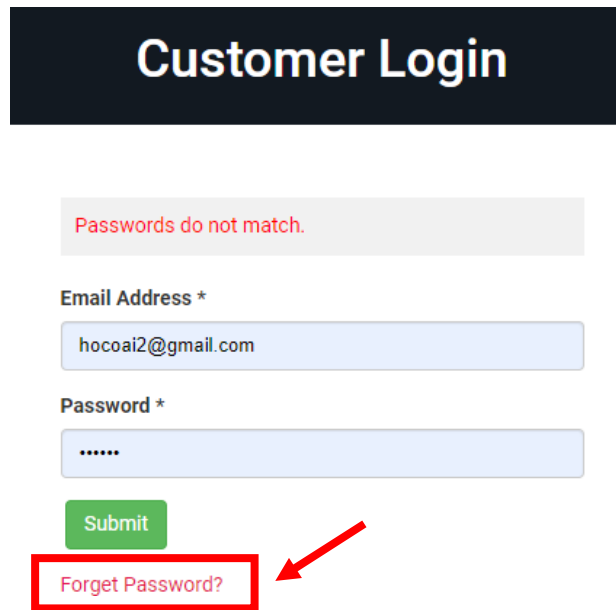
Figure 5.4.1 Register Page

If the email address that user provide is used for an existing account, the system will show a message to notice the user (Figure 5.4.2).

Email Address Already Exists.

Figure 5.4.2 Error Message

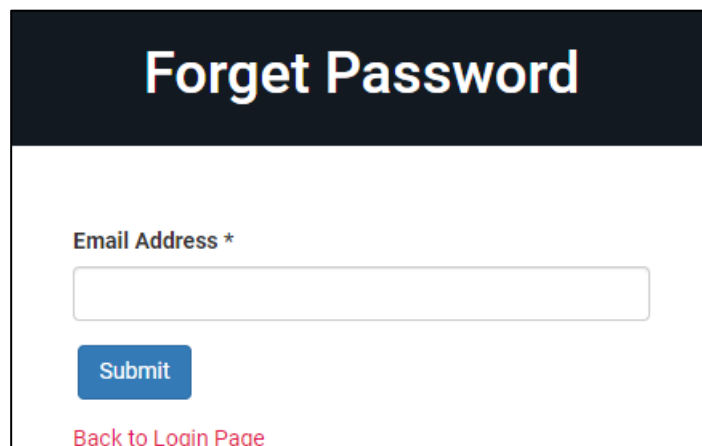
If a user has already registered, they can log in by entering their email address and password. However, if a user forgets their password, they can click on the "Forgot Password?" link situated under the "Submit" button (Figure 5.4.3).



The screenshot shows a login form with a dark header containing the text "Customer Login". Below the header, there is a red error message: "Passwords do not match.". The form includes two input fields: "Email Address *" with the value "hocoai2@gmail.com" and "Password *" with masked characters ".....". A green "Submit" button is positioned below the password field. Underneath the "Submit" button, there is a red-bordered box containing the text "Forgot Password?". A red arrow points from the right side of the page towards this "Forgot Password?" link.

Figure 5.4.3 Login Page

After that, the user will be directed to the "Forgot Password" page (Figure 5.4.4). Upon providing their email address, an email will be dispatched to initiate the password reset process.



The screenshot shows a page with a dark header containing the text "Forget Password". Below the header, there is a form with a single input field labeled "Email Address *". Below the input field is a blue "Submit" button. At the bottom of the form, there is a red text link that says "Back to Login Page".

Figure 5.4.4 Forget Password Page

Main Page

Firstly, Figure 5.4.5 shows the main page of Smiley.

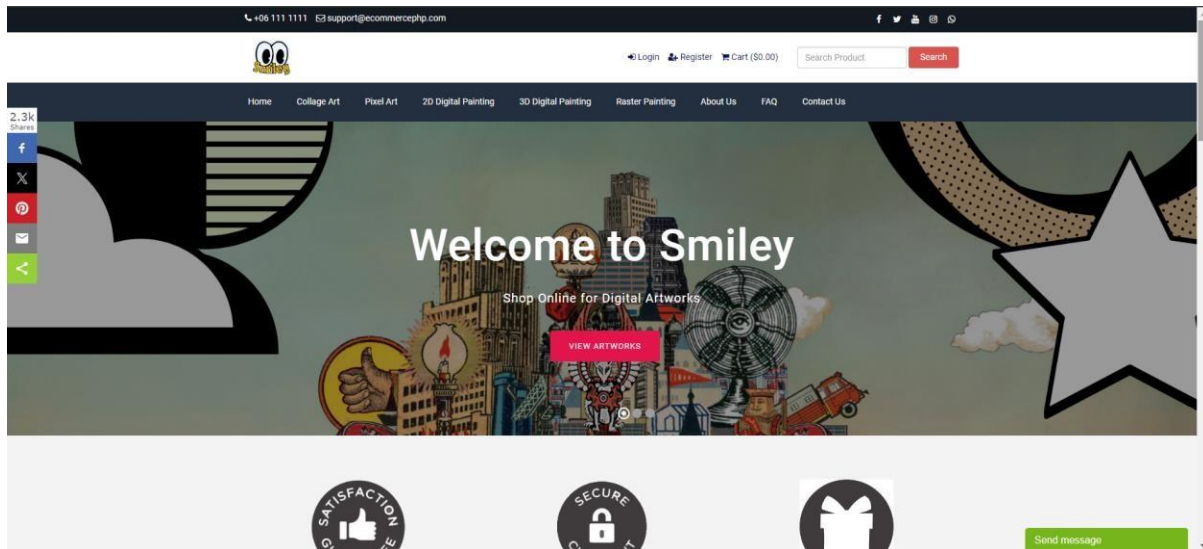


Figure 5.4.5 Main Page

When the user visit Smiley, the banner slider on the website will display a welcoming message, promotional discounts, and customer support information.

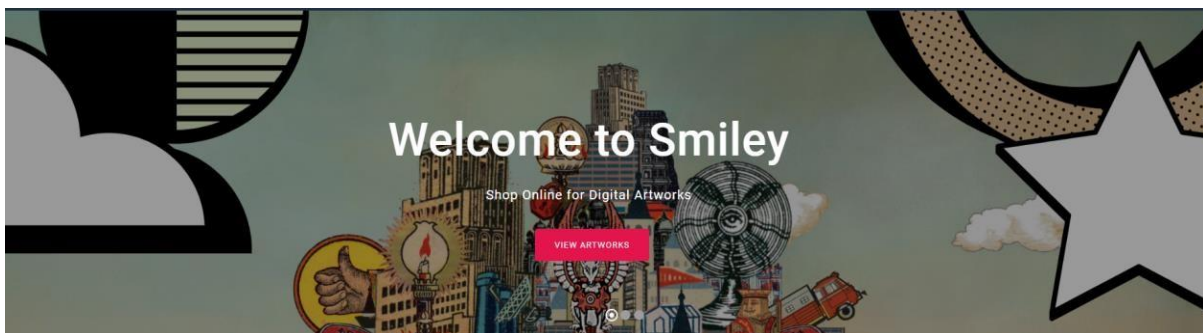


Figure 5.4.6 Slider Message - Welcome

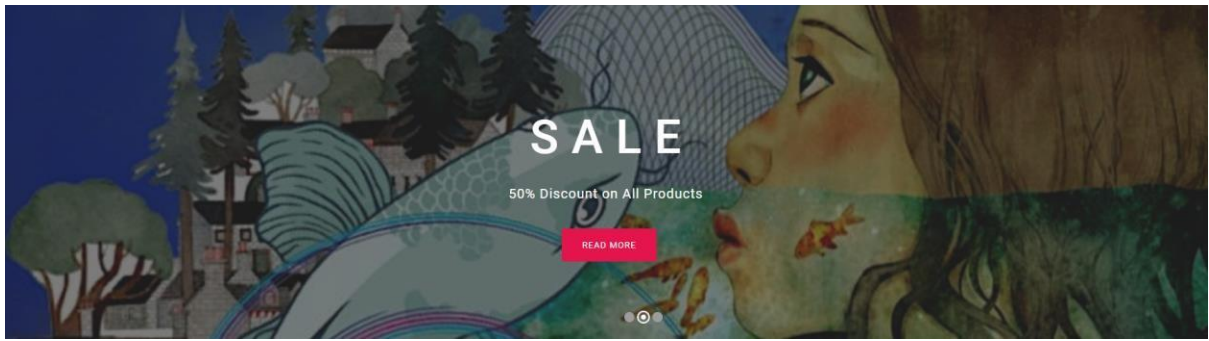


Figure 5.4.7 Slider Message – Sale

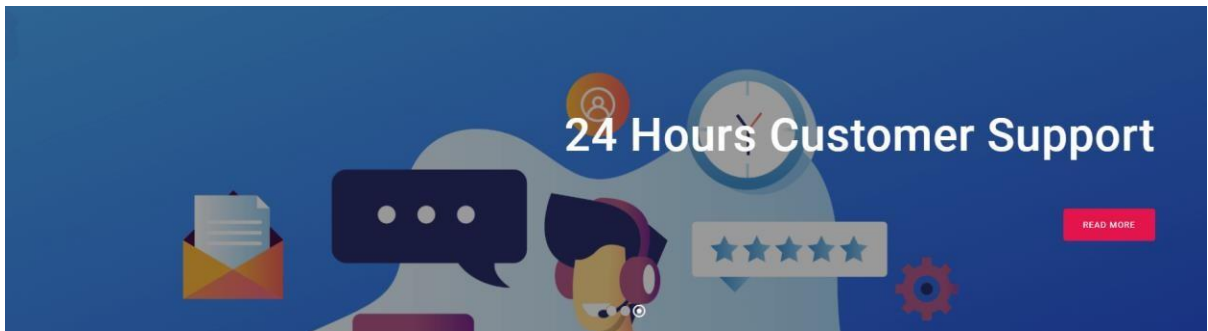


Figure 5.4.8 Slider Message – Customer Support

Furthermore, it will showcase the various features and services offered by Smiley to users, including secure checkout service, gifting feature, and schedule delivery feature (Figure 5.4.9).

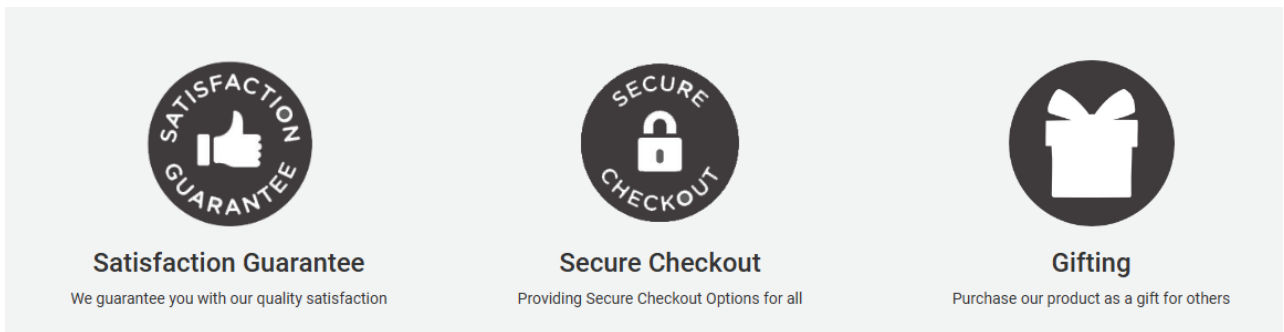


Figure 5.4.9 Services

At the main page, some recently added products will be shown as Figure 5.4.10. It can help the user to easily find the latest products in Smiley.

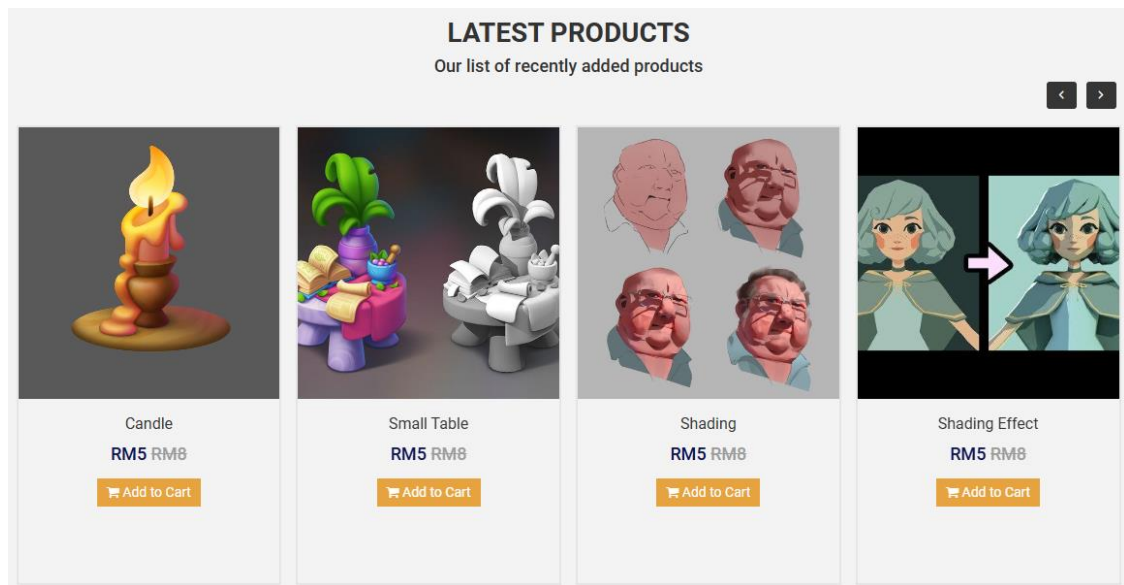


Figure 5.4.10 Latest Products

If users are satisfied with the services offered by Smiley and desire to share their experience with others, they can achieve this by clicking on the buttons positioned on the left side of the main page (Figure 5.4.11). Once clicking the appropriate button, the system will display a small window for the chosen social media platform, enabling users to post directly.



Figure 5.4.11 Share Button

Product Page

Once the user clicks on the product they're interested in, the system will direct them to the product page. Here, they will discover details such as the product name, price, and available quantity options. Users can then add the product to their cart and also have the choice to share the link on social media. Beside, there will a watermark on the top right side of the product to protect the intellectual property of the artists.

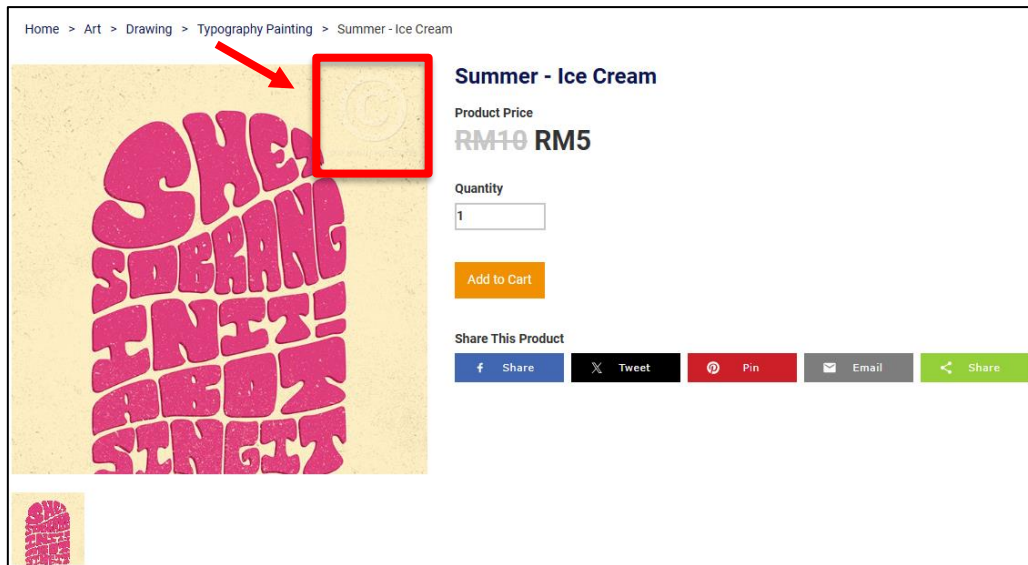


Figure 5.4.12 Product Page

Besides, user can scroll down to view more details of the product such as product description and conditions.

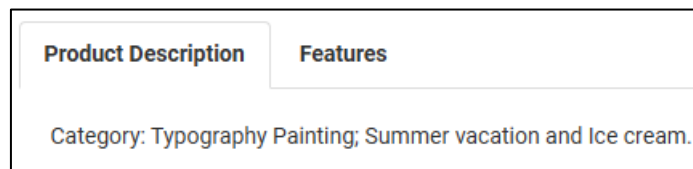


Figure 5.4.13 Product Details

After that, the system will recommend some related products to the user (Figure 5.4.14).

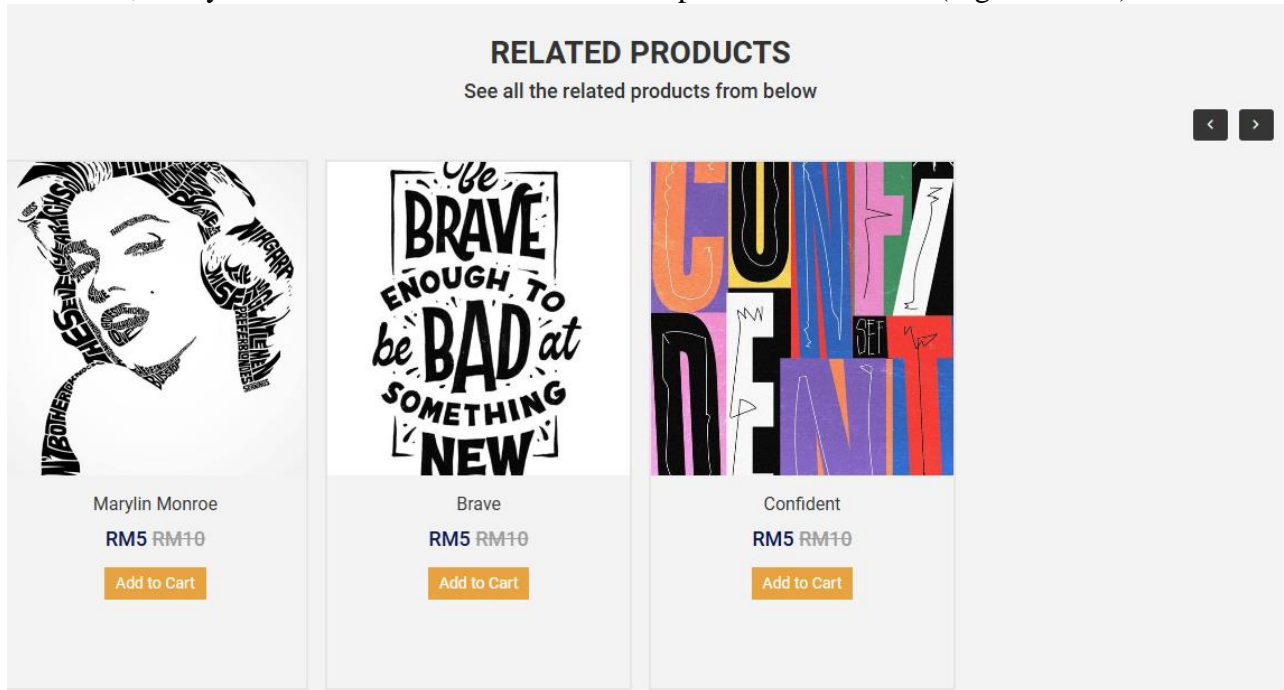


Figure 5.4.14 Related Products

If user add the product to cart, the total amount of the cart will be updated.

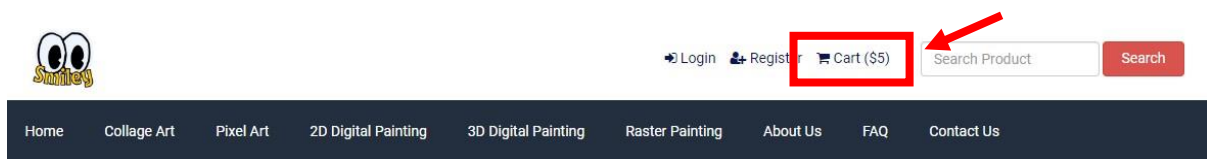


Figure 5.4.15 Total Amount of Cart

All products that user add to cart will be listed out, the system will calculate the total amount of all products (Figure 5.4.16). User can choose to remove the product from their cart by clicking the trash icon of the specific product. The system will prompt out a message to confirm that user want to delete the product (Figure 5.4.17).

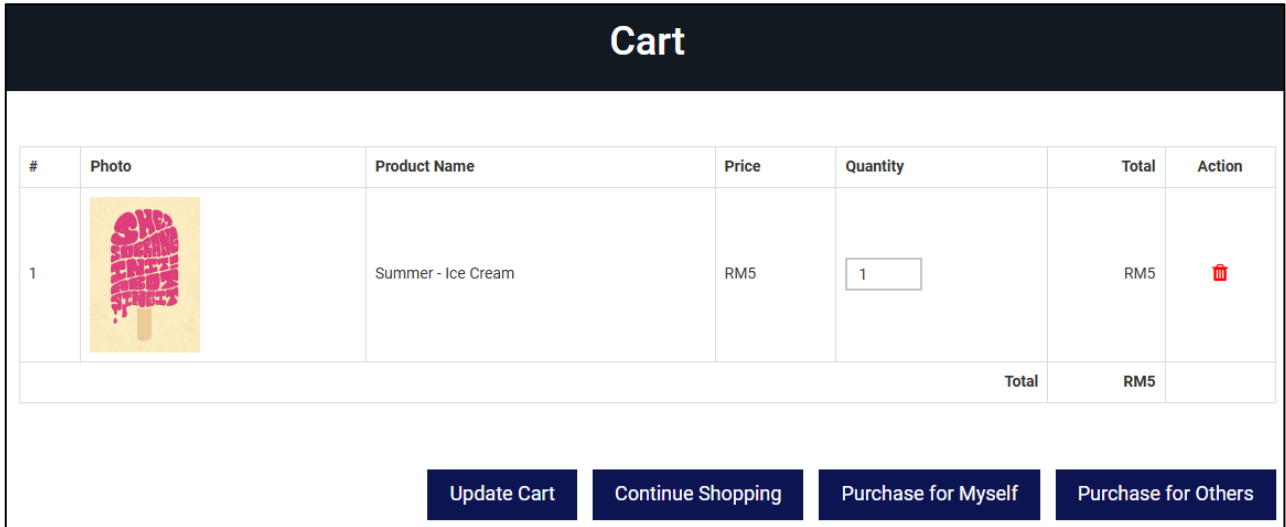


Figure 5.4.16 Cart Page

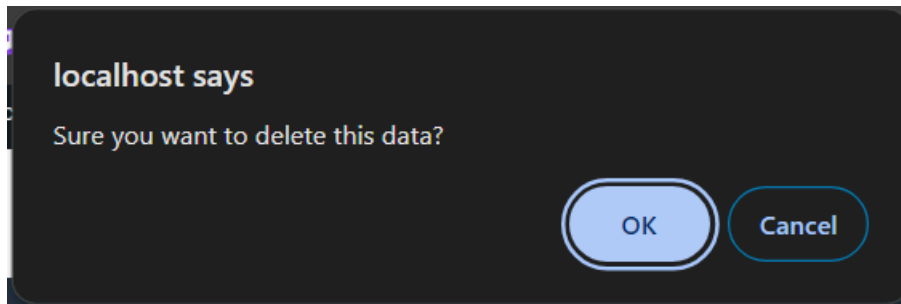


Figure 5.4.17 Remove Product from Cart

User can go back to the main page by clicking the 'Continue Shopping' button (Figure 5.4.18). If cart is empty, the system will show a message to notify user to add products to the cart (Figure 5.4.19).

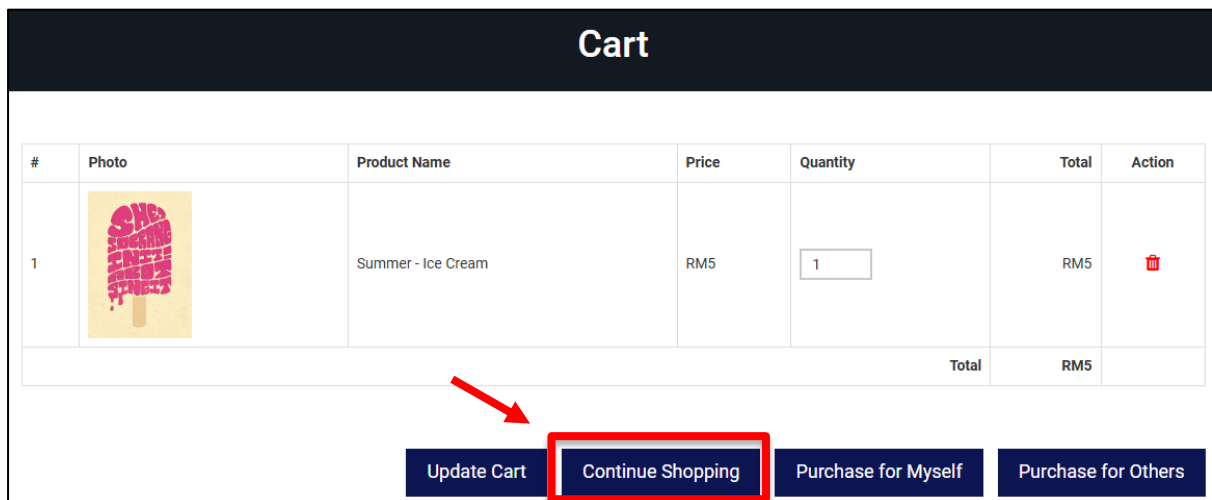


Figure 5.4.18 'Continue Shopping' Button

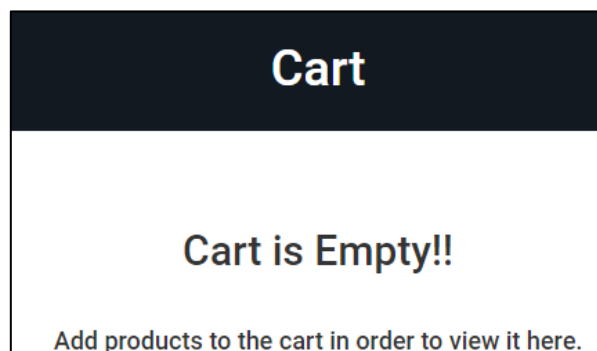



Figure 5.4.19 Empty Cart

When user click on 'Purchase for Myself' and 'Purchase for Others' button, it will lead the user to the checkout page (Figure 5.4.20). User will be asked to fill in the recipient's details and click the 'save' button.

Checkout

Order Details

#	Photo	Product Name	Price	Quantity	Total
1		Summer - Ice Cream	RM5	1	RM5
Total					RM5

Billing Address

Full Name	APPLE
Phone Number	0182860933

Shipping Address

Full Name	APPLE
Email Address	hocoai2@gmail.com

[Back to Cart](#)

Figure 5.4.20 Checkout Page

Recipient Details

Full Name

Email Address

Phone Number

Customize Message

Save Gifting Details

Figure 5.4.21 Recipient Details

After that, user can proceed to the payment process by choosing the payment method, then click 'Pay Now' button (Figure 5.4.22).

Payment Section

Select Payment Method * PayPal

Pay Now

Figure 5.4.22 Payment Method

After that, the website will lead the user to PayPal page to complete the payment (Figure 5.4.23). Once the payment is successfully received, the website will show the successful message (Figure 5.4.24).

Bayar dengan PayPal

Dengan akaun PayPal, anda layak untuk Perlindungan Pembelian dan Ganjaran.

E-mel atau nombor telefon mudah alih
sb-fom47632653345@personal.example.com

Kata laluan
..... Paparkan

Terlupa kata laluan?

Log Masuk

atau

Bayar dengan Kad Debit atau Kredit

Figure 5.4.23 PayPal

Congratulation! Payment is successful.

Back to Dashboard

Figure 5.4.24 Payment Success

At the same time, the recipient will receive an email (Figure 5.4.25).



Figure 5.4.25 Email

Through the dashboard (Figure 5.4.26), user can update profile (Figure 5.4.27), update password (Figure 5.4.28), view order history (Figure 5.4.29), and logout.

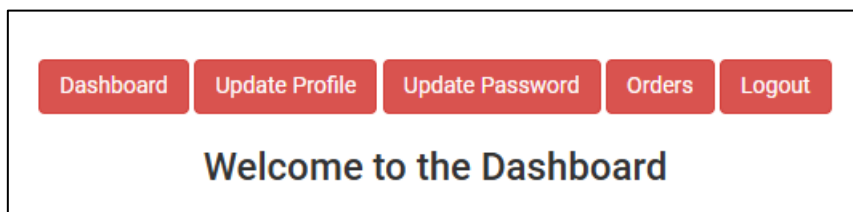


Figure 5.4.26 Dashboard

Figure 5.4.27 Update Profile

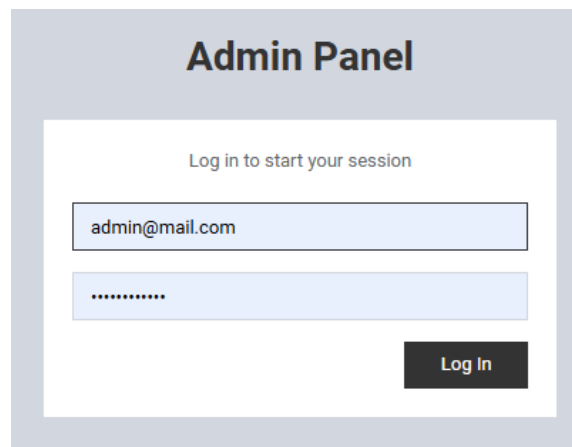
Figure 5.4.28 Update Password

Order History							
#	Product Details	Payment Date and Time	Transaction ID	Paid Amount	Payment Status	Payment Method	Payment ID
1	Product Name: Summer - Ice Cream Quantity: 1 Unit Price: RM5	2024-09-13 15:11:43		RM5	Pending	PayPal	1726211503

Figure 5.4.29 Order History

Admin Page

Log in to <http://localhost/Smiley/admin/login.php> by entering the email address and password.



The image shows a login form titled "Admin Panel". It contains the text "Log in to start your session" above two input fields. The first field contains the email address "admin@mail.com" and the second field contains a masked password ".....". A "Log In" button is located at the bottom right of the form.

Figure 5.4.30 Admin login

After authorization, admin will be led to the dashboard of admin page (Figure 5.4.31).

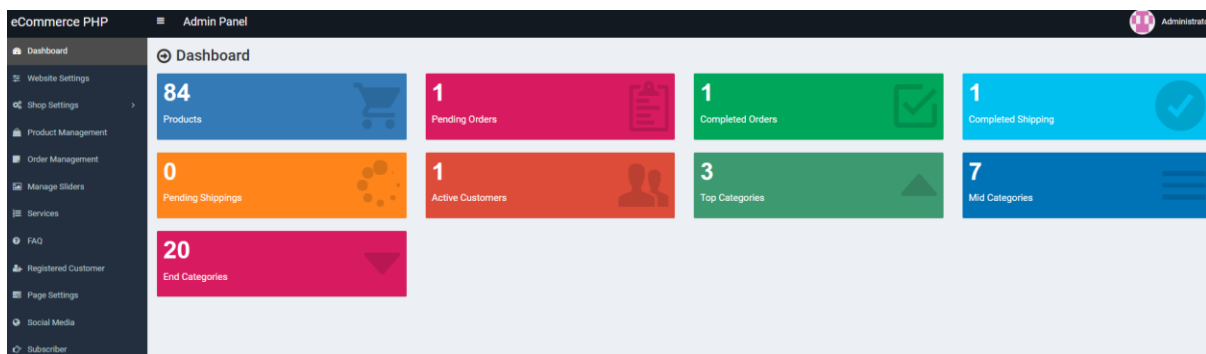


Figure 5.4.31 Dashboard

Admin able to change the website settings, such as logo, and other information that will shown on the website.

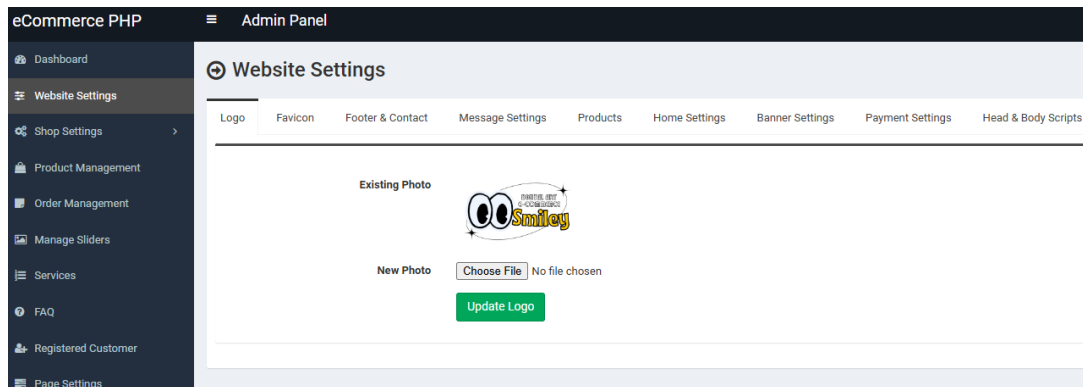


Figure 5.4.32 Website Settings

Admin also able to add, delete, modify the product categories.

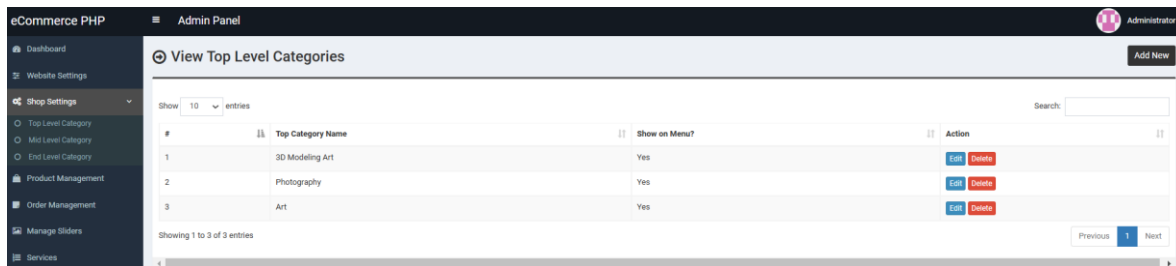


Figure 5.4.33 Categories

Admin can view all products on the website. Admin can choose to add new product and modify the product's details by clicking the 'Edit' button. Admin also can delete the existing product by clicking the 'Delete' button.

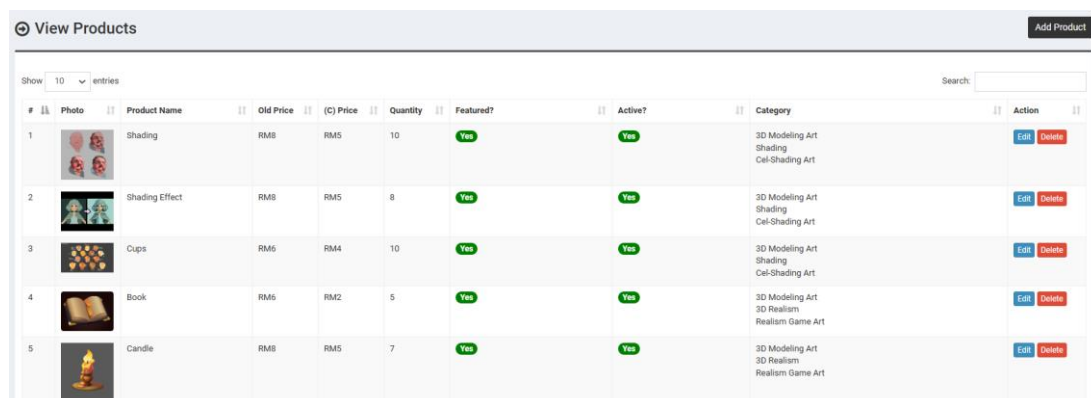


Figure 5.4.34 View Products

Admin are required to fill in the product details when adding new product (Figure 5.4.35).

The screenshot shows a web form titled "Add Product". It contains the following fields and elements:

- Top Level Category Name ***: A dropdown menu with the text "Select Top Level Category".
- Mid Level Category Name ***: A dropdown menu with the text "Select Mid Level Category".
- End Level Category Name ***: A dropdown menu with the text "Select End Level Category".
- Product Name ***: A text input field.
- Old Price**: A text input field with the subtext "(In MYR)".
- Current Price ***: A text input field with the subtext "(In MYR)".
- Quantity ***: A text input field.
- Featured Photo ***: A "Choose File" button followed by the text "No file chosen".
- Other Photos**: A "Choose File" button followed by the text "No file chosen" and a red "X" icon.
- Description**: A rich text editor with a toolbar containing icons for undo, bold, underline, strikethrough, font color, background color, bulleted list, numbered list, indent, table, link, and unlink.

Figure 5.4.35 Add Product

If the product is added successfully, the website will show a message (Figure 5.4.36).

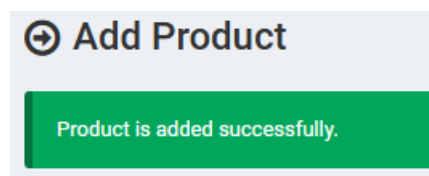


Figure 5.4.36 Successful Message

After clicking the 'Edit' button, admin able to modify the product's details. Admin can make any necessary changes to all the details.

Edit Product

Top Level Category Name * 3D Modeling Art

Mid Level Category Name * Sculpture

End Level Category Name * Cast Sculpture

Product Name * Nose

Old Price (in USD) 8

Current Price * (in USD) 7

Quantity * 8

Existing Featured Photo

Change Featured Photo Choose File No file chosen

Description

Category: Cast Sculpture; Nose.
Format: JPEG.
Size: 28KB.

Figure 5.4.37 Edit Product

After clicking the 'Delete' button, a message will prompt out to confirm the deletion (Figure 5.4.38).

Delete Confirmation

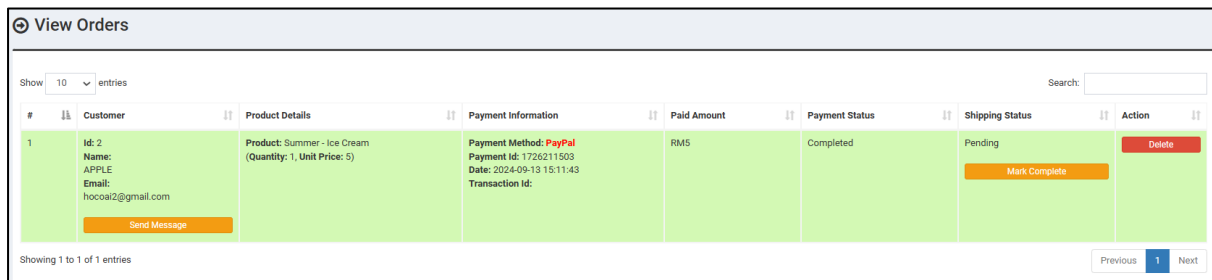
Are you sure want to delete this item?

Be careful! This product will be deleted from the order table, payment table, size table, color table and rating table also.

Cancel Delete

Figure 5.4.38 Delete Confirmation

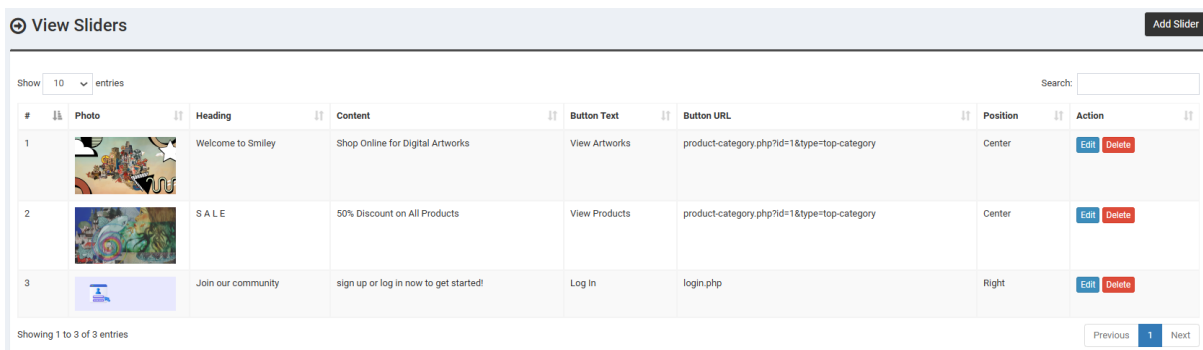
Admin also able to view all orders and check the payment status. Admin has the power to mark complete and also delete the orders.



#	Customer	Product Details	Payment Information	Paid Amount	Payment Status	Shipping Status	Action
1	Id: 2 Name: APPLE Email: hocoai2@gmail.com Send Message	Product: Summer - Ice Cream (Quantity: 1, Unit Price: 5)	Payment Method: PayPal Payment Id: 1726211503 Date: 2024-09-13 15:11:43 Transaction Id:	RMS	Completed	Pending Mark Complete	Delete

Figure 5.4.39 View Orders

Admin can make any necessary changes to sliders (Figure 5.4.40), services (Figure 5.4.41), FAQs (Figure 5.4.42) that will shown on the main page of the website.






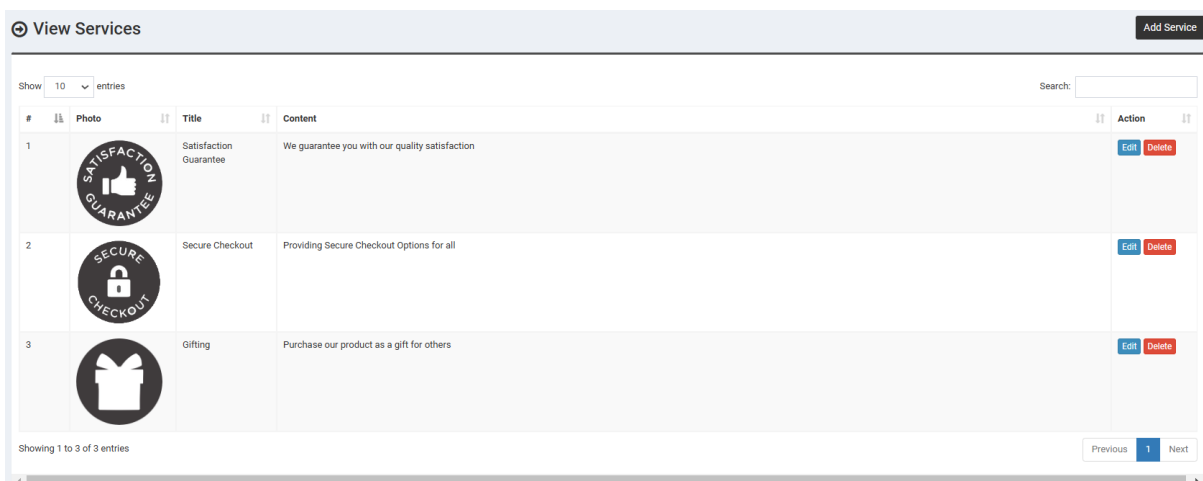
#	Photo	Heading	Content	Button Text	Button URL	Position	Action
1		Welcome to Smiley	Shop Online for Digital Artworks	View Artworks	product-category.php?id=1&type=top-category	Center	Edit Delete
2		S A L E	50% Discount on All Products	View Products	product-category.php?id=1&type=top-category	Center	Edit Delete
3		Join our community	sign up or log in now to get started!	Log In	login.php	Right	Edit Delete

Figure 5.4.40 View Sliders






#	Photo	Title	Content	Action
1		Satisfaction Guarantee	We guarantee you with our quality satisfaction	Edit Delete
2		Secure Checkout	Providing Secure Checkout Options for all	Edit Delete
3		Gifting	Purchase our product as a gift for others	Edit Delete

Figure 5.4.41 View Services

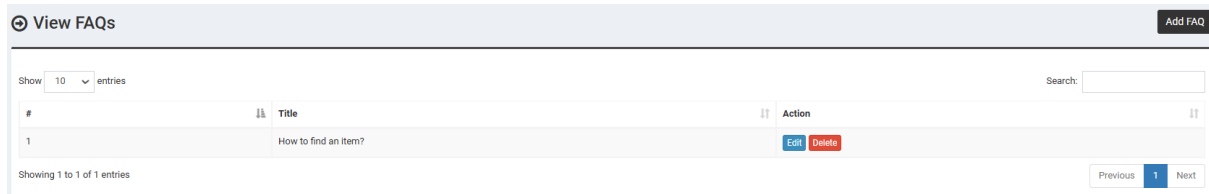


Figure 5.4.42 View FAQs

When admin clicks on ‘Registered Customer’ from the side bar, all customer will be listed out (Figure 5.4.43). Admin able to change the status of the customer or delete the customer account.

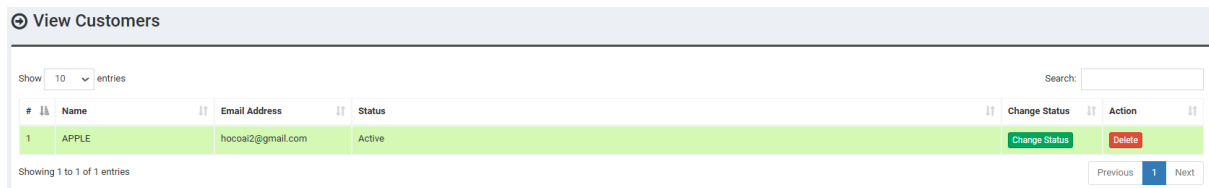


Figure 5.4.43 View Customers

If the admin wish to edit their profile, they can click on the profile that displayed on the top right side of the page (Figure 5.4.44). Admin can click on ‘Log out’ if they wish to log out.

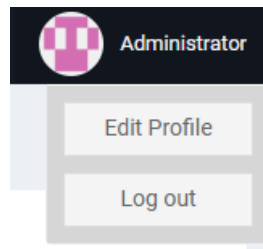
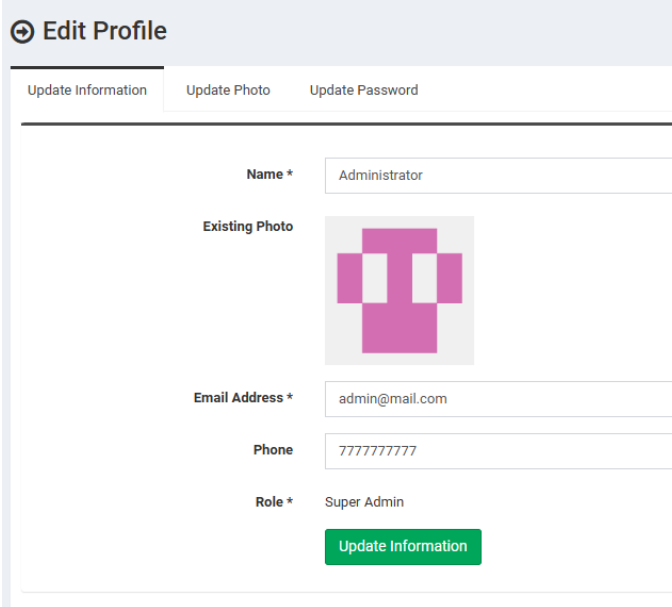


Figure 5.4.44 Admin Profile

After clicking the 'Edit Profile', admin can change their profile details.



The screenshot displays a web interface for editing a profile. At the top, there is a header with a back arrow icon and the text "Edit Profile". Below the header, there are three tabs: "Update Information" (which is active), "Update Photo", and "Update Password". The main content area contains several form fields:

- Name ***: A text input field containing the value "Administrator".
- Existing Photo**: A square area containing a placeholder image of a pink cross.
- Email Address ***: A text input field containing the value "admin@mail.com".
- Phone**: A text input field containing the value "777777777".
- Role ***: A text input field containing the value "Super Admin".

At the bottom of the form, there is a green button labeled "Update Information".

Figure 5.4.45 Edit Profile

5.5 Implementation Issues and Challenges

User Interface Design

One of the primary challenges is creating a user interface that is both intuitive and easy to navigate. The aim is to streamline the purchasing process by reducing the number of steps a user must take to complete a purchase. Ensuring a seamless experience while maintaining functionality can be complex, as it involves balancing ease of use with the need for various essential features.

Email-Based Product Delivery

The current approach to delivering purchased digital products is through email, using Gmail's SMTP for email distribution. However, this presents a challenge: the system is limited to sending products to only one recipient at a time. This means that for each purchase, the product can only be sent to one email address per transaction. Expanding the capability to send to multiple recipients at once could improve the system's flexibility and user experience.

Local Server Limitation

Since the project runs on a local server without a real domain name, it is limited in terms of scalability and cannot be fully deployed in a real-world environment. This restricts the project's potential for broader usage and prevents real-world exposure, making it challenging to simulate a true e-commerce experience beyond local testing.

Watermark Protection for Intellectual Property

While the website uses a watermark system to protect the intellectual property of the artists, there is still a significant challenge in preventing unauthorized distribution of purchased artwork. Once a user purchases and downloads a piece of artwork, they can potentially share it with others outside the platform, bypassing the watermark protection. This remains a vulnerability in fully securing the digital assets and protecting the artists' rights.

Chapter 6

System Evaluation and Discussion

6.1 Black Box Testing

Black box testing is a software testing method where the internal workings of the system are not known to the tester. Instead, the focus is on examining the functionality of the application by providing input and analyzing the output, without any knowledge of how the internal code, structures, or algorithms work. This type of testing ensures that the software behaves as expected based on its requirements. In this proposed project, the black box testing will be divided into two categories, which is user site functionalities and admin site functionalities.

6.1.1 User Site

Table 6.1.1.1 Test Scenario: Check Account Login Functionality on User Site

No	Test Case	Value	Expected Result	Actual Result
1	Login with valid email and password	Email: hocoai2@gmail.com (valid) Password: Hocoai2002 (valid)	Successfully logged in.	Same as expected result
2	Login with invalid password	Email: hocoai2@gmail.com (valid) Password: Hocoai (invalid)	Display an error message and request to log in again.	Same as expected result

3	Login with invalid email	Email: hocoai@gmail.com (invalid) Password: Hocoai2002 (valid)	Display an error message and request to log in again.	Same as expected result
4	Login with invalid email and password	Email: hocoai@gmail.com (invalid) Password: Hocoai (invalid)	Display an error message and request to log in again	Same as expected result
5	Login with blank email and password	Email: Password:	Display an error message and request to log in again	Same as expected result
6	Login with blank email	Email: Password: Hocoai2002 (valid)	Display an error message and request to log in again	Same as expected result
7	Login with blank password	Email: hocoai2@gmail.com (valid) Password:	Display an error message and request to log in again	Same as expected result

Table 6.1.1.2 Test Scenario: Check Register Account Functionality on User Site

No	Test Case	Value	Expected Result	Actual Result
1	Register with valid details	Enter valid user details	Successfully register.	Same as expected result
2	Register with email that already existed	Enter email that is already linked with an existing account.	Display an error message and request to register again.	Same as expected result
3	Register with missing value	Leave one required fields blank	Display an error message and request to register again.	Same as expected result
4	Attempt to register with valid details but navigate away from the page before submitting	Leaving the page without submitting	The user's information is not saved.	Same as expected result

Table 6.1.1.3 Test Scenario: Check Search Functionality on User Site

No	Test Case	Value	Expected Result	Actual Result
1	Verify the ability to search an existing product	Enter the name of an existing product in search bar	Matching products found and shown	Same as expected result
2	Verify the ability to search a non-existing product	Enter the name of a non-existing product in search bar	No matching products found	Same as expected result
2	Ability to display all products under top categories	Click on 'Art', 'Photography' or '3D Modelling Art'	All products that under the categories shown.	Same as expected result
3	Ability to display all products under middle categories	Click on the middle categories	All products that under the categories shown.	Same as expected result
4	Ability to display all products under end categories	Click on the end categories	All products that under the categories shown.	Same as expected result

Table 6.1.1.4 Test Scenario: Check Product Selection and Payment Functionality on User Site

No	Test Case	Value	Expected Result	Actual Result
1	Verify the ability to select and view products	Select a product from the list.	The selected product is displayed in details.	Same as expected result
2	Verify the ability to add the products into cart	Click 'Add to Cart' button	The selected product is successfully add to cart	Same as expected result
3	Verify the ability to checkout	Click 'Purchase for Myself' button	Successfully proceed to checkout	Same as expected result
4	Verify the ability to purchase as a gift	Click 'Purchase for Others' button	Successfully proceed to gifting process	Same as expected result
5	Verify the ability to proceed payment	Click 'Pay Now' button	Successfully proceed to payment process	Same as expected result

Table 6.1.1.5 Test Scenario: Check User Profile Management and History Functionality on User Site

No	Test Case	Value	Expected Result	Actual Result
1	Verify the ability to update profile	Enter new profile details	User Profile Updated	Same as expected result
2	Verify the ability to update password	Enter new password	New password updated	Same as expected result
3	Verify the ability to update password if enter old password	Enter old password	Display an error message and request to enter again.	Same as expected result
4	Verify the ability to view order history	Click 'Orders' button	Successfully view order history	Same as expected result
5	Verify the ability to view order history when no history exists	New user clicks 'Orders' button	System will not show any order history	Same as expected result
5	Verify the ability to logout	Click 'Logout' button	Successfully Logout	Same as expected result

Table 6.1.1.6 Test Scenario: Check Product Sending Functionality on User Site

No	Test Case	Value	Expected Result	Actual Result
1	Verify the ability to purchase for myself and send product through email when payment success	Payment successfully	Customer received an email with the product	Same as expected result
2	Verify the ability to purchase for others and send product through email when payment success	Enter recipient's details and payment successfully	Recipient received an email with the product	Same as expected result
3	Verify the ability to purchase for others and send product with customized message through email when payment success	Enter recipient's details, customized message and payment successfully	Recipient received an email with the customized message and product	Same as expected result

6.1.2 Admin Site

Table 6.1.2.1 Test Scenario: Check Account Login Functionality on Admin Site

No	Test Case	Value	Expected Result	Actual Result
1	Login with valid email and password	Email: admin@mail.com (valid) Password: Password@123 (valid)	Successfully logged in.	Same as expected result
2	Login with invalid password	Email: admin@mail.com (valid) Password: Password123 (invalid)	Display an error message and request to log in again.	Same as expected result
3	Login with invalid email	Email: admin124@mail.com (invalid) Password: Password@123 (valid)	Display an error message and request to log in again.	Same as expected result
4	Login with invalid email and password	Email: admin123@mail.com (invalid) Password: Password123 (invalid)	Display an error message and request to log in again	Same as expected result
5	Login with blank email and password	Email:	Display an error	Same as expected result

		Password:	message and request to log in again	
6	Login with blank email	Email: Password: Password@123 (valid)	Display an error message and request to log in again	Same as expected result
7	Login with blank password	Email: admin@mail.com (valid) Password:	Display an error message and request to log in again	Same as expected result

Table 6.1.2.2 Test Scenario: Check User Management Functionality on Admin Site

No	Test Case	Value	Expected Result	Actual Result
1	Verify the ability to view the customer list	Navigate to “Registered Customer”	A list of registered customers shown	Same as expected result
2	Verify the ability to delete a registered customer	Click on “Delete” button	The selected customer deleted and removed from database	Same as expected result
3	Verify the ability to search an existing customer	Enter the name of an existing customer in search bar	Matching customers found and shown	Same as expected result
4	Verify the ability to search a non-existing customer	Enter the name of a non-existing customer in search bar	No matching customers found	Same as expected result

Table 6.1.2.3 Test Scenario: Check Product Management Functionality on Admin Site

No	Test Case	Value	Expected Result	Actual Result
1	Verify the ability to view the product list	Navigate to “Product Management”	A list of products shown	Same as expected result
2	Verify the ability to delete an existing product	Click on “Delete” button	The selected product deleted and removed from database	Same as expected result
3	Verify the ability to search an existing product	Enter the name of an existing product in search bar	Matching products found and shown	Same as expected result
4	Verify the ability to search a non-existing product	Enter the name of a non-existing product in search bar	No matching products found	Same as expected result
5	Verify the ability to edit an existing product with new details	Change the quantity number of an existing product and click “Update” button	New details saved and updated	Same as expected result
6	Verify the ability to delete an existing product	Select a product, click “Delete” button, and click “Delete” during the confirmation message.	The product deleted and removed from the database	Same as expected result

7	Verify the ability to delete an existing product but cancel during the confirmation message	Select a product, click “Delete” button, and click “Cancel” during the confirmation message.	The product still exist	Same as expected result
8	Verify the ability to add new product	Click “Add Product” button and enter all the details that needed	A new product is added	Same as expected result
9	Verify the ability to add new product with missing details	Click “Add Product” button and missing the details that needed	Error message will be shown and the product will not be added	Same as expected result

Table 6.1.2.4 Test Scenario: Check Order Management Functionality on Admin Site

No	Test Case	Value	Expected Result	Actual Result
1	Verify the ability to view the order list	Navigate to “Order Management”	A list of order shown	Same as expected result
2	Verify the ability to delete an order	Click on “Delete” button	The selected order deleted and removed from database	Same as expected result
3	Verify the ability to search an existing order	Enter the name of customer, product, or payment method of existing order in search bar	Matching orders found and shown	Same as expected result
4	Verify the ability to search a non-existing customer	Enter the name of customer, product, or payment method of a non-existing order in search bar	No matching orders found	Same as expected result
5	Verify the ability to delete an existing order	Select an order, click “Delete” button, and click “Delete” during the confirmation message.	The order deleted and removed from the database	Same as expected result
6	Verify the ability to delete an existing order	Select an order, click “Delete” button, and click	The order still exist	Same as expected result

	but cancel during the confirmation message	“Cancel” during the confirmation message.		
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6.2 Project Challenges

The proposed digital artwork e-commerce website faces several significant challenges that must be addressed for successful implementation. One major challenge is the email-based product delivery system, which currently uses Gmail's SMTP and it has limited product distribution that can deliver to only one recipient at a time. This approach reduces satisfaction for users who may wish to send products to multiple recipients. Another key issue is the local server limitation. The website currently is hosted on a local server without a real domain name, restricting its deployment and potential in a real-world environment. This limitation lower down the platform's scalability and prevents it from reaching a broader audience.

Although the website uses watermarks to protect the intellectual property of the artists, it faces the challenge of preventing unauthorized sharing of digital artwork after purchase. Once users have acquired and downloaded artwork, they can still distribute it outside the platform, which compromises the goal of safeguarding intellectual property. This remains a significant vulnerability in protecting artists' rights.

Scalability and performance are additional concerns. As the platform grows, it will need to handle increasing numbers of users, products, and transactions without experiencing slow performance or crashes. Effective database management is essential in this regard, as poor database organization could lead to data inconsistencies and delays in real-time synchronization. Security is another critical challenge, as the system must ensure the secure handling of sensitive user data, such as passwords and payment information. The integration of PayPal for payment processing also faces challenges, it needs to ensure smooth, error-free transactions and maintaining a positive user experience and avoiding potential sales loss at the same time.

Finally, providing a user support and feedback system is important. Without a method for users to report issues or ask for help, it will negatively be impacting the platform's reputation. In addition, thorough testing and debugging are necessary to ensure all features, such as authentication, product management, search, and payment processing function correctly. Comprehensive testing, like black box testing, will be essential for identifying and resolving potential issues before the platform is fully launched. Addressing these challenges proactively will be critical to the website's long-term success.

6.3 Objectives Evaluation

1. To enable users to track the delivery process

This objective is crucial for enhancing transparency and accountability in the order fulfillment process. The successful implementation of this feature would increase user trust and satisfaction, as users are able to track their order at every stage. The evaluation of this objective would focus on the accuracy of delivery notifications, the responsiveness of the tracking system, and the overall user experience. Challenges could include integrating reliable tracking systems and ensuring real-time updates are consistently provided.

2. To protect the intellectual property rights of artists

The protection of intellectual property is a critical objective, particularly in a platform dealing with digital artworks. The inclusion of mechanisms like watermarking and digital rights management (DRM) is essential for preventing unauthorized use and distribution. The evaluation of this objective would depend on how effectively the system prevents artwork piracy and maintains the integrity of artists' creations. Factors such as ease of use, the effectiveness of watermarking without compromising artwork quality, and the robustness of DRM systems would be considered. However, ensuring absolute protection may remain a challenge, as no system can completely prevent unauthorized sharing after purchase.

3. To enable users to send digital artworks as thoughtful gifts

The gifting feature adds a layer of personalization and engagement to the platform, allowing users to send digital artworks as thoughtful presents. The evaluation of this objective would focus on how seamlessly users can send artworks as gifts, including the ease of adding custom messages. Potential challenges could include ensuring smooth user interactions when selecting and sending gifts.

6.4 Concluding Remark

In conclusion, the successful implementation of the key features of this digital artwork e-commerce platform will significantly enhance the overall user experience and ensure the protection of artists' intellectual property. The delivery tracking system will improve transparency and trust, allowing users to monitor their purchases with ease and confidence. Robust intellectual property protection mechanisms, such as watermarking and digital rights management (DRM), will safeguard artists' creations from unauthorized reproduction and distribution, ensuring the integrity of their work.

Furthermore, the introduction of the gifting feature, with customizable messages and scheduled deliveries, will add a personal and engaging element to the platform, fostering meaningful connections between users and their recipients. By simplifying the gifting process and ensuring secure, timely delivery of digital artworks, the platform will cater to both practical and emotional needs, positioning itself as a versatile and user-friendly marketplace. Overall, these features will collectively contribute to the platform's success, offering a secure, transparent, and enjoyable environment for users and artists alike.

Chapter 7

Conclusion and Recommendation

7.1 Conclusion

The development of the digital artwork e-commerce platform has involved substantial effort to ensure that it meets the needs of both users and artists while providing a secure, user-friendly environment. Throughout the project, various modules were refined and enhanced, with a focus on improving core features such as user authentication, product management, payment processing, and intellectual property protection. The system incorporates essential functions such as real-time delivery tracking, the ability to gift digital artworks, secure payment processing using PayPal, and safeguarding artists' intellectual property through watermarking and digital rights management (DRM).

Key improvements were made in comparison to existing platforms, particularly in the gifting module and intellectual property protection. The gifting feature allows users to send digital artwork with personalized messages, providing a more interactive and thoughtful experience for users. The intellectual property protection system, which includes watermarking, offers a level of security to protect the creative rights of artists, something that is often lacking or insufficient in similar platforms. This project, through its thoughtful integration of features, has succeeded in building a platform that balances user convenience with the protection of artists' creative work, distinguishing itself from competitors.

7.2 Future Plan and Recommendation

For the future, several enhancements can be considered to further improve the platform's functionality and user experience. Expanding the range of payment methods, such as integrating credit card processing, bank transfers, and alternative digital wallets, would provide users with more flexible payment options. Enhancing the email distribution system to allow the sending of digital artworks to multiple recipients simultaneously would increase convenience for users, especially when gifting.

Additionally, the platform could introduce a member points or loyalty rewards system, encouraging repeat purchases and long-term engagement. Another recommendation would be to develop a mobile application version of the platform, offering users easier access to the marketplace from their smartphones or tablets. This would not only expand the platform's reach but also provide more convenience to users, improving their overall experience. These enhancements would build on the current system's strengths, positioning the platform for continued success and growth in the competitive digital artwork marketplace.

REFERENCES

- [1] H. Kawamura, Y. Nemoto, S. Maruyama, A. Kozai, N. Tosa and R. Nakatsu, "Development of Art Fashion by Integrating Digital Art and Digital Textile Printing," 2022 Nicograph International (NicoInt), Tokyo, Japan, 2022, pp. 25-28, doi: 10.1109/NicoInt55861.2022.00012.
- [2] O. A. Raheem, "E-Commerce Security: Classifications and Arts," 2018 International Conference on Computer and Applications (ICCA), Beirut, Lebanon, 2018, pp. 1-3, doi: 10.1109/COMAPP.2018.8460453.
- [3] Y. K. Dwivedi, "Metaverse beyond the hype: Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy," *International Journal of Information Management*, vol. 66, no. 66, p. 102542, Oct. 2022, doi: <https://doi.org/10.1016/j.ijinfomgt.2022.102542>.
- [4] J. Jiang, Y. Gao and Y. Li, "Enhancing Copyright Protection Through Blockchain and Ring Signature Algorithm From Lattice," in *IEEE Access*, vol. 12, pp. 41247-41254, 2024, doi: 10.1109/ACCESS.2024.3376385.
- [5] L. Zweeris. *7 ways to effectively implement gifting features* [Online]. Available: <https://www.code.digital/blog/7-ways-to-effectively-implement-gifting-features>
- [6] L. Bogaerts, "*The informational potential of art e-commerce platforms for art investors*," Master thesis, Master Cultural Economics and Entrepreneurship, Erasmus School of History, Culture and Communication, 2015.
- [7] Artchive, "17 Types of Digital Art Styles," Artchive. [Online]. Available: <https://www.artchive.com/art-mediums/digital-art/styles/>
- [8] C. Roach. (2024, Aug. 22). "What is Digital Rights Management (DRM)?" [Online]. Available: <https://www.digitalguardian.com/blog/what-digital-rights-management>
- [9] *Etsy* [Online]. Available: <https://www.etsy.com>
- [10] *DeviantArt* [Online]. Available: <https://www.deviantart.com>
- [11] *DeviantArt Help Center* [Online]. Available: <https://www.deviantartsupport.com/kb/en/article/how-do-i-buy-or-download-content-8172809>
- [12] *ArtStation* [Online]. Available: <https://www.artstation.com>
- [13] *ArtStation Support* [Online]. Available: <https://help.artstation.com/hc/en-us/articles/360056658232-General-FAQ-For-Buyers>

- [14] *Dribbble* [Online]. Available: <https://www.dribbble.com>
- [15] PHP, “PHP: What is PHP? - Manual,” *Php.net*, 2019. <https://www.php.net/manual/en/intro-what-is.php>
- [16] MDN Contributors, “What is JavaScript?,” *MDN Web Docs*, Jul. 02, 2019. https://developer.mozilla.org/en-US/docs/Learn/JavaScript/First_steps/What_is_JavaScript
- [17] *Tutorchase.com*, 2023 [Online]. Available: <https://www.tutorchase.com/answers/ib/computer-science/why-is-css-essential-in-web-page-design-and-layout> (accessed Apr. 19, 2024).
- [18] “Introduction — phpMyAdmin 5.1.0-dev documentation,” *docs.phpmyadmin.net*. <https://docs.phpmyadmin.net/en/latest/intro.html>

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: T1, Y4	Study week no.:2
Student Name & ID:Ho Co Ai, 2102408	
Supervisor: TS Phan Koo Yuen	
Project Title: Digital Artisan Marketplace: Empowering Local Artists with a Digital Art E-commerce Platform	

1. WORK DONE

[Please write the details of the work done in the last fortnight.]

- Problem statement, objectives
- Literature review

2. WORK TO BE DONE

- Coding

3. PROBLEMS ENCOUNTERED

- No

4. SELF EVALUATION OF THE PROGRESS

- Good



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Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: T1, Y4	Study week no.:3
Student Name & ID:Ho Co Ai, 2102408	
Supervisor: TS Phan Koo Yuen	
Project Title: Digital Artisan Marketplace: Empowering Local Artists with a Digital Art E-commerce Platform	

1. WORK DONE

[Please write the details of the work done in the last fortnight.]

- Problem statement, objectives
- Literature review

2. WORK TO BE DONE

- Coding

3. PROBLEMS ENCOUNTERED


- No

4. SELF EVALUATION OF THE PROGRESS

- Good



Supervisor's signature



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FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: T1, Y4	Study week no.:4
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Supervisor: TS Phan Koo Yuen	
Project Title: Digital Artisan Marketplace: Empowering Local Artists with a Digital Art E-commerce Platform	

1. WORK DONE

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- Problem statement, objectives
- Literature review

2. WORK TO BE DONE

- Coding
- Implementation
- Evaluation

3. PROBLEMS ENCOUNTERED

- Database problems

4. SELF EVALUATION OF THE PROGRESS

- Good



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FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

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Supervisor: TS Phan Koo Yuen	
Project Title: Digital Artisan Marketplace: Empowering Local Artists with a Digital Art E-commerce Platform	

1. WORK DONE

[Please write the details of the work done in the last fortnight.]

- Problem statement, objectives
- Literature review

2. WORK TO BE DONE

- Coding
- Implementation
- Evaluation

3. PROBLEMS ENCOUNTERED

- Payment process

4. SELF EVALUATION OF THE PROGRESS

- Good



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FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: T1, Y4	Study week no.:8
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Supervisor: TS Phan Koo Yuen	
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- Problem statement, objectives
- Literature review

2. WORK TO BE DONE

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- Implementation
- Evaluation

3. PROBLEMS ENCOUNTERED

- No

4. SELF EVALUATION OF THE PROGRESS

- Good



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FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

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Supervisor: TS Phan Koo Yuen	
Project Title: Digital Artisan Marketplace: Empowering Local Artists with a Digital Art E-commerce Platform	

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- Problem statement, objectives
- Literature review
- Coding

2. WORK TO BE DONE

- **Implementation**
- **Evaluation**
- **Full report**

3. PROBLEMS ENCOUNTERED

- **No**

4. SELF EVALUATION OF THE PROGRESS

- **Good**



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FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

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Supervisor: TS Phan Koo Yuen	
Project Title: Digital Artisan Marketplace: Empowering Local Artists with a Digital Art E-commerce Platform	

1. WORK DONE

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- Problem statement, objectives
- Literature review
- Coding Implementation

2. WORK TO BE DONE

- **Evaluation**
- **Full report**

3. PROBLEMS ENCOUNTERED

- **No**

4. SELF EVALUATION OF THE PROGRESS

- **Good**



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E-COMMERCE

Digital Artwork

WEBSITE



Objective:

- enable users to track in delivery process
- protect the intellectual property rights of artists
- enable users to send digital artworks as gifts to others

Module:

- User Management Module
- Product Management Module
- Security and Intellectual Property Module
- Tracking Module
- Gifting Module



Why?

- popularize of digital media and platforms among artists
- dedicated online platform to showcase and sell their digital artworks

Project Developer: Ho Co Ai

Project Supervisor: Ts Phan Koo Yuen

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ID Number(s)	2102408
Programme / Course	Business Information System (IB)
Title of Final Year Project	Digital Artisan Marketplace: Empowering Local Artists with a Digital Art E-commerce Platform

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Signature of Supervisor

Name: Phan Koo Yuen

Date: 2024-09-13

Signature of Co-Supervisor

Name: _____

Date: _____



UNIVERSITI TUNKU ABDUL RAHMAN

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√	Weekly Log
√	Poster
√	Signed Turnitin Report (Plagiarism Check Result - Form Number: FM-IAD-005)
√	I agree 5 marks will be deducted due to incorrect format, declare wrongly the ticked of these items, and/or any dispute happening for these items in this report.

*Include this form (checklist) in the thesis (Bind together as the last page)

I, the author, have checked and confirmed all the items listed in the table are included in my report.

(Signature of Student)

Date: 2024-09-13