

# Photography Studio Information Management System

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## Abstract

The photography and videography industry has grown rapidly due to digital technology and evolving consumer expectations. The web-based Photography Studio Information Management System was developed to address challenges for Hatta Awang Photography Studio to improve operational efficiency. Currently, the studio relies on manual methods to manage booking, which are time-consuming and prone to errors, impacting customer experience and creating inefficiencies for admin and staff in managing business data and communication. The system aims to streamline booking processes and enhance customer service. Developed using a prototyping methodology, the project leverages CSS, HTML, PHP, and MySQL for database management. Automation reduces the workload of staff and administrators, allowing them to manage studio services more effectively. Additionally, it provides customers with an intuitive platform to access business information, explore services, and make bookings conveniently, fostering customer satisfaction and loyalty.

## 1. Introduction

The photography and videography services industry has seen substantial growth, driven by the rapid advancements in digital technology and shifting consumer expectations. Today's skilled photographers and videographers leverage their expertise to start businesses that offer affordable services to clients. There is a high demand for these services, especially in communities needing more expertise but desiring high-quality results [1]. Services such as wedding, graduation, event photography and videography are top-rated, as customers seek to capture significant moments and preserve them as meaningful memories.

The growth of online shopping has been facilitated by the increasing purchasing power of customers and the integration of this activity with social media and mobile platforms [2]. In Malaysia, SMEs contribute approximately 32% of the Gross Domestic Product (GDP) [3]. An online presence through a website is crucial for businesses in the digital age, particularly with the continuous evolution of social media platforms and digital marketing strategies [4]. The growth in Gross Domestic Product (GDP) was also boosted by the rise in online businesses, with SMEs contributing 38.9% to the GDP and 66% of national employment [5]. Using e-commerce tools and social media platforms has increased profit margins, revenue, and global reach [6].

In this paper, a study was conducted at Hatta Awang Studio, also known as HAP Studio, which specializes in photography and videography services. It offers a variety of service packages, including weddings, convocations, self-portraits, and more. The company currently employs traditional methods for managing business operations, utilizing Microsoft Excel and Telegram for record-keeping and customer booking information. All customer and booking data, including physical files, are manually stored in these applications, while Dropbox is used to store customer photos and videography. The company receives both online and offline orders from customers. The company owner manually calculates business sales, profit, and loss in Excel based on completed services.

The booking management process is crucial to HAP Studio's operations, yet they still rely on manual methods to track service status and store data across multiple platforms. Online customers cannot view the company's services and must contact the company directly for information. The lack of a company website increases the frequency of communication between the administrator and staff, as only the administrator is aware of online service orders. Additionally, the separate storage of information for walk-in and online bookings complicates the staff's ability to track the total number of customers and orders. The staff also does not store walk-in customer information electronically, using hard copy forms to collect customer data to handle photo transfers via WhatsApp based on company services. This inefficiency affects the company owner or administrator, who must manually compile a list of completed services in Microsoft Excel to generate sales reports.

Therefore, an online booking system called the HAP Studio information management system has been built to effectively manage the order and booking process. This system allows administrators and staff to handle online and walk-in reservations and store customer information on a single platform. Additionally, it offers customers a convenient way to view and reserve studio services online. The system also helps track customer reservations based on the company's service schedules. This system will enhance the studio's operational efficiency by simplifying booking service management.

This article contains five sections. Section one explains the introduction and details about the project's background. In section two, which is a literature review, the topic related to current system procedures, methods, and technologies used for the creation of new systems is discussed. The topic includes web-based information systems and e-business. A comparison of similar systems is also provided from the aspect of features and functionalities. In section three, the methodology used is outlined together with the outcome from the analysis and design. Section four discusses the system's implementation and functional testing results. The final section concludes with a summary of this paper.

## 2. Related Work

This section explores the realm of photography services, focusing on the role of photo studios in capturing significant life moments. It examines the transformation of the photography sector due to the rise of social media and technological progress, which have heightened competition while simultaneously making professional services more available. Additionally, the discussion highlights the importance of creativity and quality in distinguishing photography providers in a rapidly evolving market.

A picture studio is a service provider that offers photography services to document important life events, including marriages, engagements, anniversaries, graduations, and family moments [7]. Typically, studio photography takes place indoors within a specially designed, controlled environment. These studios are equipped with professional photographers, assistants, and sometimes trainees and offer various backgrounds, lighting, furniture, props, and models to create ideal shots. Photography services have become increasingly vital in everyday life with the rise of digital devices [8].

The widespread use of mobile phones and social media platforms like Facebook, Instagram, and WhatsApp has made photography services more accessible. However, professional studios are still essential for producing high-quality images that amateur setups often cannot match. Professional photographers bring the necessary expertise, creativity, and advanced equipment for superior photos, which is crucial for businesses looking to distinguish themselves, individuals capturing key moments, and industries needing effective visual communication. The growing demand for top-notch images without investing in expensive gear or complex techniques continues to drive the need for professional photography services [9].

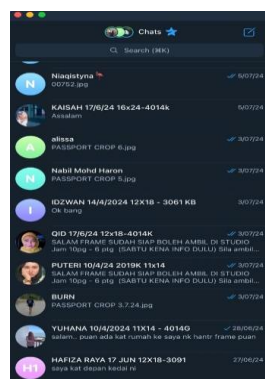


Fig. 1 Customers Messages

Service Name	Price	Status
Portrait	100000	Completed
Wedding	200000	Completed
Family	150000	Completed
Product	50000	Completed
Event	180000	Completed
Studio	120000	Completed
Portrait	100000	Completed
Wedding	200000	Completed
Family	150000	Completed
Product	50000	Completed
Event	180000	Completed
Studio	120000	Completed
Portrait	100000	Completed
Wedding	200000	Completed
Family	150000	Completed
Product	50000	Completed
Event	180000	Completed
Studio	120000	Completed

Fig.2 Services Sales

Online customers only learn about photography services and packages after inquiring via WhatsApp. The owner handles online customers and responds to all business operations and service questions. Suppose a

customer is interested in booking a service slot or purchasing a service. In that case, the owner checks the date and time of the booking manually across all business information storage platforms. Additionally, the owner contacts staff to confirm that the chosen date and time for the online customer's booking are still available and do not conflict with offline bookings. All bookings from online customers are communicated to staff via Telegram or phone calls to ensure they are informed and can provide the service at the studio. Figure 1 shows the Telegram conversation.

Furthermore, staff record all business operations information in the studio using hardcopy files, Excel, and Telegram. Walk-in customers fill out a service purchase form and make payment before receiving services from the staff. Photos or videos are stored in Dropbox and sent to customers via Telegram. Staff manually track customer services across all data storage platforms to update the status of payments and services, whether completed, ready for pickup, in process, or pending. Finally, the owner manually calculates service sales and business operations to determine profit and loss and generate a sales report. All purchases and sales recorded across data storage platforms for the month are considered and documented in the sales report shown in Figure 2. Figure 3 shows the hardcopy service form.

**Fig. 3** Hardcopy Service Form

Implementing a centralized information management system for Hatta Awang Studio (HAP Studio) is vital for improving efficiency and accuracy in business operations. The reliance on multiple platforms for data management and communication increases the risk of errors and inefficiencies. A single platform that houses client data, booking information, and payment statuses would simplify data management and make it easier for staff and the owner to access and amend records. This would also enhance communication by providing real-time updates and reducing dependence on fragmented channels like WhatsApp and Telegram. For customers, the system would offer instant access to service information and facilitate a more convenient online booking process, leading to an improved experience. Additionally, it would minimize manual tracking errors, ensure accurate reporting and better management of the studio's financial performance, thereby fostering more reliable service delivery and overall operational efficiency.

E-commerce platforms' accessibility and convenience have contributed to digital transactions and online shopping growth. Businesses can establish a solid corporate identity and cultivate customer relationships through their website or e-commerce platform, ultimately leading to customer loyalty [10]. Online purchase transactions have increased significantly due to e-commerce advancements and the Internet's growing popularity [11]. Additionally, a well-known business premise increases customer trust and promotes online shopping [12]. Businesses can track purchasing trends, analyze consumer behavior, and customize their products to suit customer preferences using e-commerce platforms. These platforms help companies draw in, interact with, and keep consumers while offering insightful information to help them with marketing, inventory control, and customer support.

Business Information System comprises interconnected elements that collaborate to execute tasks such as input, processing, output, storage, and control [13]. This process converts data into concrete information for operational tasks like forecasting and decision-making within an organization. Modern organizations require effective and efficient information management to support individual and organizations' daily use of information. An information system is a computerized system that processes data to achieve specific functions. Computer-based information systems transform businesses' operations by giving management access to concrete data to make wise decisions. This supports operational management and the decision-making process within the organization.

The proposed Photography Studio Information Management System for HAP Studio requires a web-based information system (WBIS) to streamline operations and provide seamless service access. A WBIS will enable the studio to manage customer data efficiently, bookings, and inventory through an integrated database, ensuring data is accurate, up-to-date, and easily accessible. This system supports real-time data operations, enhancing operational efficiency and enabling informed decision-making. The accessibility of a web-based system allows both customers and staff to interact with the system from any location via the Internet, improving customer service by offering online bookings and updates. Additionally, the system enhances internal communication and coordination, reducing reliance on fragmented data management methods like Excel and WhatsApp. Ultimately, the WBIS method will improve data accuracy, operational efficiency, and customer satisfaction, making it essential for the proposed system at HAP Studio.

An essential step in the development process is thoroughly analyzing current photography studio commerce systems. This will provide valuable information about the market, help identify potential problems and their solutions in advance, make performance benchmarking easier, and help build a solid foundation. Three existing systems are studied and analyzed for more information on developing a Photography Studio Information Management System, such as Juzy Photography and Rich Moment Photo Sdn. Bhd and VNC Production. Thorough observation was carried out on similar systems, and some differences and similarities were identified. Table 1 compares identical systems and the proposed systems.

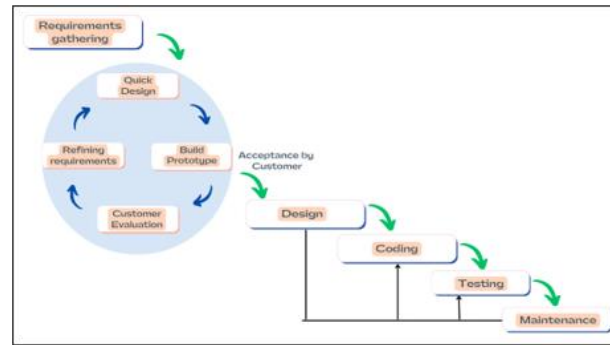
**Table 1** System's Comparison

System Features	Juzy Photography Studio	Rich Moment Photo	VNC Production	HAP Photography Studio
Login Module	X	X	√	√
Registration Module	X	X	√	√
Booking Module	X	X	√	√
Packages and Services Module	√	√	√	√
Payment process	X	X	√	√
Generate Receipt	X	X	√	√

Based on the findings, developing a photography studio management information system can be effectively built as a web-based platform, like other systems. This approach allows businesses to display customer information quickly, efficiently, and professionally. Customers can view detailed business service information and conveniently make service reservations from anywhere online. Unlike other systems, the newly developed system can also be used by staff to access and manage the business website that customers view online. With features like an order or add-to-cart function for photography and videography services in the customer's account, customers can easily purchase online services. Most systems lack a booking module, except for VNC Production, which handles customer bookings and processes online payments. This integrated platform allows staff to manage online sales efficiently by consolidating customer information, booking details, and payments. Overall, the Photography Studio Management Information System combines the strengths of existing systems to develop the best possible solution for admins, staff, and customers.

### 3. Methodology

The development methodology chosen for this system is the Prototyping model. A prototype model is a preliminary version of a product or system created to test and validate ideas before full-scale production or development [14]. In this model, a product prototype is first developed, tested, and refined as per customer feedback repeatedly until an acceptable final prototype is achieved, forming the basis for the complete system or product development. This iterative approach fosters a close working relationship between the designer and the user, involving continuous testing and reworking to ensure that the final product meets desired requirements and expectations efficiently and cost-effectively [15]. The phases in the prototyping model consist of requirement gathering, quick design, prototype building, customer evaluation, refining requirements, design, coding, testing and maintenance as shown in Figure 4. Table 2 details the tasks for each phase and the output produced.



**Fig. 4** Prototype Model

**Table 2** Activity in each phase and its deliverables

Phase	Activity	Output
Gathering requirements and analysis	Identify the company, identify the project title, identify the project scope, identify the project objective, identify the expected system behavior, and determine the project schedule, tasks, and output.  Research and compare similar systems, analyze requirements in detail and draft the system's use case and class diagram.	Proposal Gantt Chart System requirements DFD and ERD diagrams Flowchart
Design	Determine software and hardware requirements and design user interfaces. Develop the design based on the most recent customer requirements.	System design Database design User interface design
Construct prototype	Construct the prototype according to the interface and each of the modules.	Prototypes
Customer evaluation and modification	Evaluate whether the prototype meets the specified requirements. Identify any necessary modifications to add or remove requirements.	Customer reviews
Development	Develop the final system according to the previous phase.	A complete system
Testing	Allow users to test the developed system and collect feedback and suggestions to review the system's shortcomings and improvements.  Develop the system's final version and finalize the project in the documentation.	Test case results, final project report and complete workable system.
Maintenance	Fix bugs, resolve user-reported issues, and monitor system performance regularly to ensure optimal functionality and address potential bottlenecks.	Bug and performance report.

### 3.1 System Requirement Analysis

System Requirement Analysis identifies and documents the specific needs and expectations for the Photography Studio Information Management system. This step involves explicit standards for the system's design and development and specifying and prioritizing functional and non-functional requirements. The purpose is to create a detailed understanding of the system's functions and performance, which will guide the project's future phases. The system module of the developed system is analysed as shown in Table 3.

**Table 3** *Modules of Photography Studio Information Management System*

Modules	Function	User
1. Login and Registration Module	Staff and administrators can log into the system using their username and password. The system will check if the user is valid and show an error message if they are not. Only the administrator can add new staff or edit their information. Administrators can also add and update staff tasks and change staff privileges.	Administrators and Staffs
2. Booking and Order Management Module.	Staff can view orders and booking records through a calendar. They can add, delete, and update customer order records and add side notes or details about the orders. Staff can also view a list of customer reservations and orders. The administrator can view all order records and add, delete, and update customer order lists.	Administrators and staffs
3. Services management module.	The administrator can add, delete, and update the company's web page and services. Customers can view all the services offered by the company.	Administrators and staffs
4. Sales Management Module.	Customers can view details of reservation services, as well as add, delete, and update their online purchases. They can also apply discounts to their orders. The administrator can set the discount amount and quantity and store information about capital and sales turnover in the system.	Customers and Administrator
5. Report Generation Module	The system can generate sales reports.	Administrator

**Table 4** *Functional requirements*

Modules	Description
1. Login and Registration Module	<ul style="list-style-type: none"> <li>Allow new users to register new accounts before logging in.</li> <li>Allow the existing users and staff to log in with their username and password.</li> <li>Redirect the valid staff or customers to the dashboard after a successful login.</li> <li>The developed system alerts for any wrong input formats.</li> </ul>
2. Booking and Order Management Module	<ul style="list-style-type: none"> <li>Staff can view orders and booking records via the calendar.</li> <li>Allow staff to add, delete and update customer order records.</li> <li>Allow staff to add side notes or information about customer orders.</li> <li>Allow staff to view a list of customers' reservations and orders.</li> <li>Allow the administrator to view all lists of order records.</li> <li>Allow the administrator to add, delete, and update the customer's order lists.</li> </ul>
3. Services Management Module	<ul style="list-style-type: none"> <li>Allow the administrator to add, delete, and update the company webpage and services on the webpage.</li> <li>Allow the administrator to set the quantity slot for each service and package.</li> <li>Allow the administrator to assign specific tasks to staff.</li> <li>Allow customers to view all services provided by the company.</li> </ul>
4. Sales Management Module	<ul style="list-style-type: none"> <li>Allow customers to view reservation service details.</li> <li>Allow customers to add, delete and update online purchases.</li> <li>Allow customers to apply the discount to an order.</li> <li>Allow the administrator to set the discount amount and quantity.</li> <li>Allow the administrator to store capital and sales turnover in the system.</li> </ul>
5. Report Generation Module	<ul style="list-style-type: none"> <li>Allow the administrator to store capital and sales turnover in the system.</li> </ul>

Functional and non-functional requirements are critical to defining a system's capabilities and performance. Functional requirements specify the actions and operations a system must execute, such as user authentication, data handling, and report generation, essentially describing what the system should accomplish. On the other hand, non-functional requirements set the standards for the system's operation, covering aspects like performance, security, usability, and scalability. These requirements ensure the system meets quality expectations, focusing on how effectively, securely, and user-friendly it performs its functions. The system's functional and non-functional requirements are summarised in Tables 4 and 5, respectively.

**Table 5** *Non-functional requirements*

No.	Requirements	Description
1.	Performance	Ensure fast response times and efficient handling of workload.
2.	Operational	The loading time required for a website is no more than 1 minute, and the operation is maintained and easy to support.
3.	Security	Ensure the system is protected against unauthorized access and data breaches.
4.	Scalability	Ensure the system can handle the increased load without losing performance or functionality.

User requirement analysis determines and understands users' specific needs and expectations for a Photography Studio Information Management system. This involves collecting detailed insights into what users want the system to accomplish, how they plan to interact with it, and which features are essential to them. The objective is to ensure the system is designed and developed to meet these user needs, delivering a positive experience. Table 6 shows the user requirements of the photography studio information management system.

**Table 6** *User requirements*

No.	User Requirements
1.	All users, staff and administrator must have an account with a valid username and password.
2.	Staffs and administrator should be able to manage customer bookings and order details.
3.	Administrator should be able to manage the company's services on the website.
4.	Administrator should be able to create and assign tasks to staff.
5.	Users should be able to update their profile details in the system.
6.	Administrators should be able to manage online sales services, including setting, discounts and updating product availability.
7.	Administrator should be able to manage the company's financial records, including storing capital and sales turnover data.
8.	Administrators should be able to generate and view monthly sales reports.
9.	Staff should be able to view orders and booking records through a calendar interface.
10.	Customers should be able to view and manage their reservations, apply discounts, and make online purchases.

### 3.2 System Analysis

Context diagrams present an overview of the interaction between the system and its user, illustrating how the system communicates with external entities. These diagrams also show the inputs and outputs between the users and the system. Figures 5 and 6 show the context and level 0 diagram of the photography studio information management system.

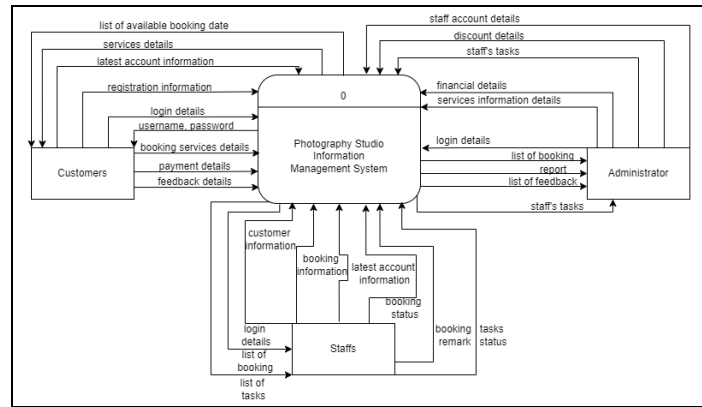


Fig. 5 Context Diagram

Data Flow Diagram (DFD) visually represents how data moves through a system. It illustrates how input from an entity flows through processes to generate output, either directed to another entity or stored in a data store. Figure 6 shows the Level 0 Data Flow Diagram (DFD 0) of the photography studio information management system. There are five processes included in the development of the developed system, which are login and register (process 1.0), book and order management (process 2.0), service management (process 3.0), sales management (process 4.0) and report generation (process 5.0). In DFD level 0 for the developed system, twelve data dictionaries are involved: customer, administrator, staff, service, tasks, book, payment, discount, cart, wish list and sales.

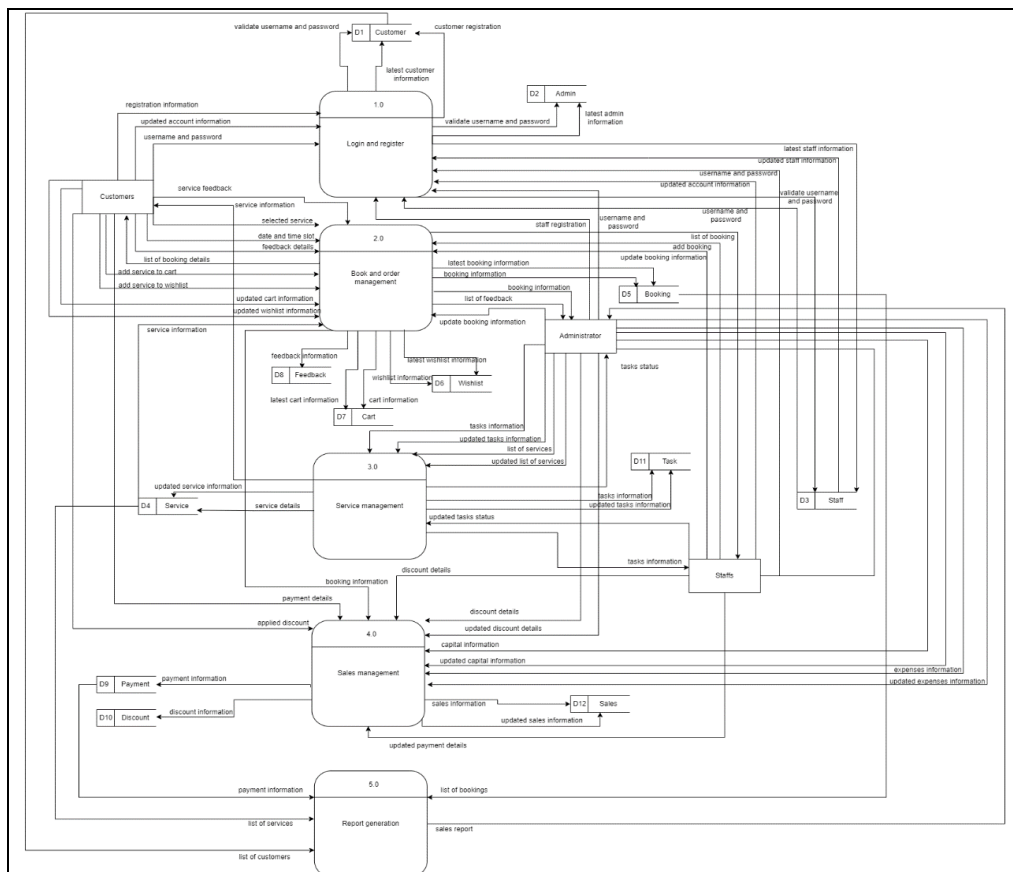


Fig. 6 Data Flow Diagram Level 0

A visual representation of the relationships between different entities in a database is known as an entity relationship diagram (ERD). It shows how the various components relate and how the data is connected. Figure 7 shows the ERD of the photography studio management information system.

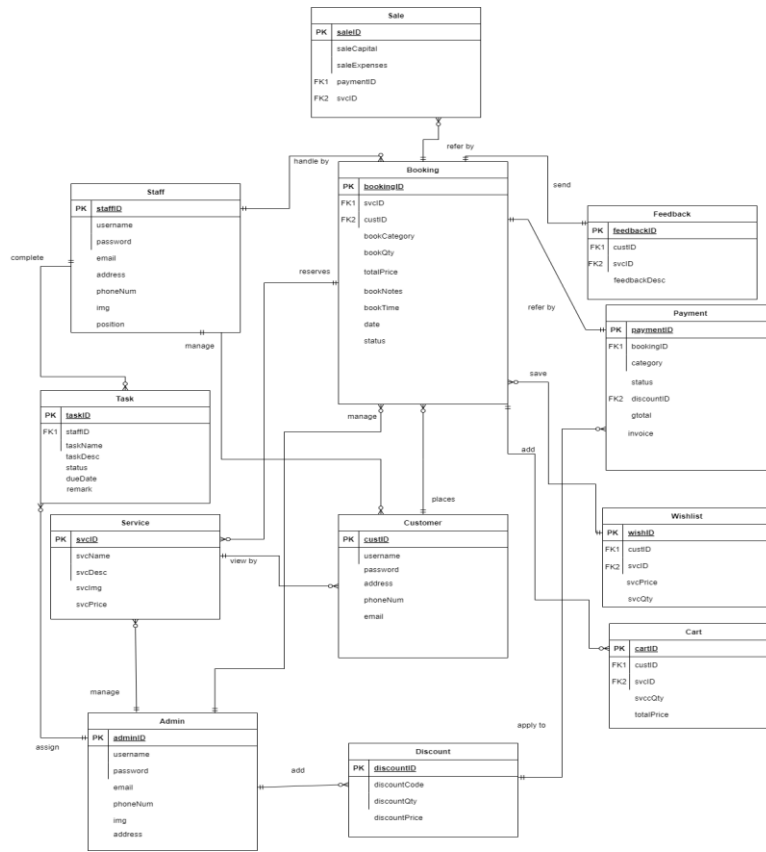


Fig. 7 Entity Relationship Diagram

A flowchart is a diagram that visually depicts a process or system, showing the order of steps from beginning to end. Figure 8 illustrates the expected system outcome of the developed system.

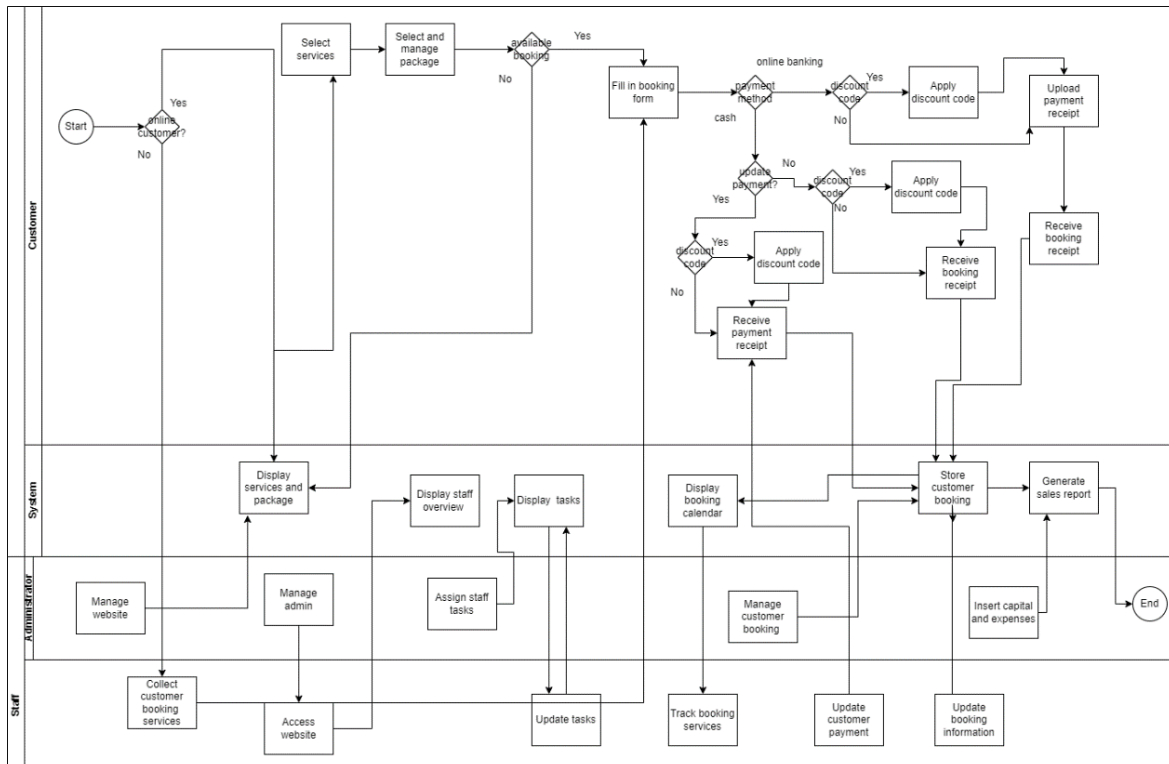
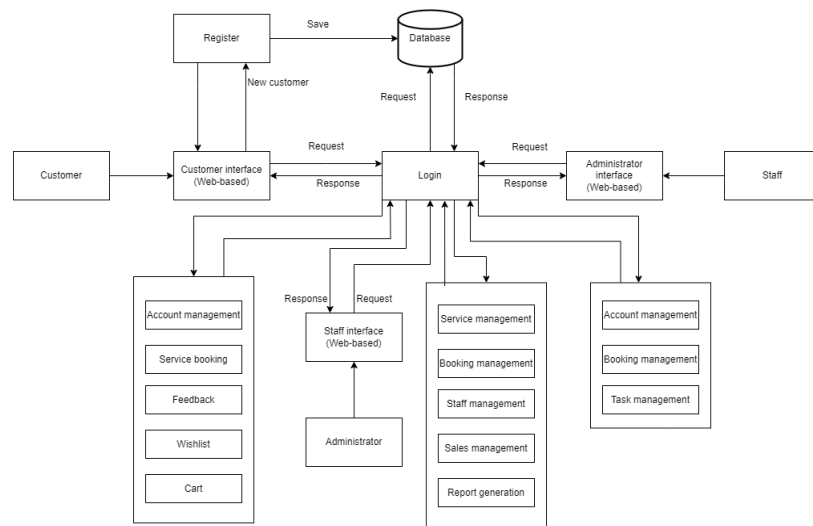


Fig. 8 Flowchart of photography information management system

### 3.3 System Design

System architecture is a conceptual model that outlines the structure of a system, comprising various hardware and software components. It outlines the interactions and behaviours these parts and subsystems must accomplish for the system to function. A system architecture diagram visually represents the structure of a system, showing how various components connect and function together. By clearly illustrating the arrangement and interactions of these components, the diagram helps understand, construct, and manage the system effectively. From a functional perspective, it establishes a strong relationship between scenarios, tasks, and the system's physical architecture [16].

Figure 9 shows the system architecture diagram for the developed system. It illustrates a web-based structure where customers, administrator, and staff interact through different interfaces. The main functions of the customer interface are account management, service booking, feedback, wish list, and cart features. The administrator handles service, booking, staff, sales management, and report generation, while the staff is responsible for managing accounts, bookings and tasks.



**Fig. 9** System Architecture

In database design, a schema acts as a blueprint that outlines how the database is structured, including the organization of tables and the relationships between different pieces of data. A schema table is a specific table within this structure where data is stored in rows and columns. The following are the schema tables created in this system.

- i. Customer (custID, username, password, address, phoneNum, email)
- ii. Staff (staffID, username, password, email, address, phoneNum, img, position)
- iii. Admin (adminID, username, password, email, phoneNum, img, address)
- iv. Service (svcID, svcName, svcDesc, svcImg, svcPrice)
- v. Sale (saleID, saleCapital, saleExpenses, paymenyID, svcID)
- vi. Task (taskID, staffID, taskName, taskDesc, dueDate, status, remark)
- vii. Feedback (feedbackID, custID, svcID, feedbackDesc)
- viii. Payment (paymentID, bookID, category, status, gtotal, invoice, discountID)
- ix. Wishlist (wishID, custID, svcID, svcPrice, svcQty)
- x. Cart (cartID, custID, svcID, svccQty, totalPrice)
- xi. Discount (discountID, discountCode, discountQty)
- xii. Booking (bookingID, svcID, custID, bookCategory, bookQty, totalPrice, bookNotes, bookTime, date, status)

### 3.4 User Interface Design

Interface design involves creating a system's visual layout and interactive elements that users engage with. Its primary goal is to deliver a user-friendly experience, enabling users to navigate the system smoothly and

complete tasks efficiently. In user interface (UI) design, the focus is on making these visual and interactive components intuitive, visually appealing, and easy to use, ensuring seamless interaction between the users and the system.

Figure 10 shows the interface for the customer and admin. Figure 10 (a) shows the services module interfaces on the customer side, which is a list of the company's available services. The design of the company's services is organized in a card format, offering concise information about each service. Figure 10 (b) shows the service management page interface for the administrator view, where the list and details of services will be displayed in a list format.

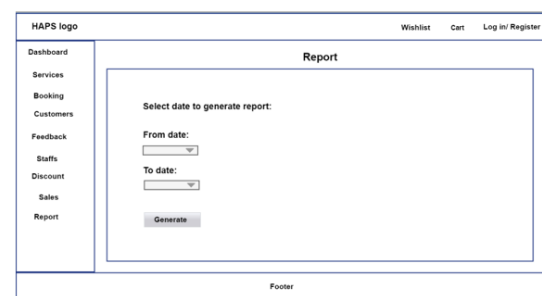


**Fig. 10** Service management module (a) Customer interface; (b) Admin interface

Figure 11 shows the booking and order management module designed for staff. This interface features a straightforward calendar representation alongside a list of customer bookings. It is specifically tailored to help staff efficiently manage their schedules for customer service. Figure 12 shows the report management page. This page is designed for the admin and staff to generate a company's report for a specific date. The report will show and generate all the information regarding customer service and booking.



**Fig.11** Staff booking management interface



**Fig.12** Report management interface

The findings from the analysis and design phase are then utilized in the implementation phase, which involves programming to bring the system to life.

## 4. Results and Discussion

This section represents the outcome of the Photography Studio Information Management System, which involves implementation and testing results. The discussion includes how the system was built, tested, and validated to ensure it meets the functional and non-functional requirements.

### 4.1 Implementation

The implementation phase involves developing the actual system based on the refined prototype. The Photography Studio Information Management System was built using programming languages such as HTML, CSS, JavaScript, and PHP for coding. The development utilized various tools, including Laravel as the backend framework, MySQL as the database management system, Laragon as the web server, and Visual Studio Code as the integrated development environment (IDE).

This web-based system utilizes phpMyAdmin in conjunction with a MySQL database. Establishing a connection between the web application and the database is essential for managing and accessing its content. Every module within the system depends on this connection to execute operations and fetch data. The .env file in the project must be configured with the database credentials, such as the username and password, to ensure

compatibility with the designated database. Figure 13 demonstrates the configuration setup used to link the database for the developed system, named psm1\_project.

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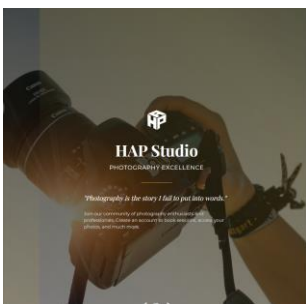
.env
1 APP_NAME=Laravel
2 APP_ENV=local
3 APP_KEY=base64:ItNi/vsVM7Cz6sE4Tu/QJniSEQ1x2kwYsGfkhWx0HY=
4 APP_DEBUG=true
5 APP_URL=http://localhost
6
7 LOG_CHANNEL=stack
8 LOG_DEPRECATIONS_CHANNEL=null
9 LOG_LEVEL=debug
10
11 DB_CONNECTION=mysql
12 DB_HOST=127.0.0.1
13 DB_PORT=3306
14 DB_DATABASE=psm1_project
15 DB_USERNAME=root
16 DB_PASSWORD=
    
```

**Fig. 13 Database Connection Code Segment**

The newly developed web-based Photography Studio Information Management System for Hatta Awang Photography Studio has been successfully published on a web hosting platform. This makes it accessible to both customers and studio staff. This system offers key functionalities including booking processes, easy access to business information and service details for customers, and efficient management of business data and communications for administrators and staff. The system is accessible online at <https://hapstudiobp.com>, allowing users to interact with its features and functionalities in a live environment.

### 4.1.1 Login and Registration Module

Figure 14 shows the customer interface of the account registration page. They are required to register their name, email, password, confirm password, phone number, and address to create an account. Figure 15 displays the registration page for staff accounts, which are created by the administrator. Staff accounts are generally set up by the administrator, and staff members only need to provide their information to the administrator for account creation.



**Fig. 14 Customer Account Registration Interface**

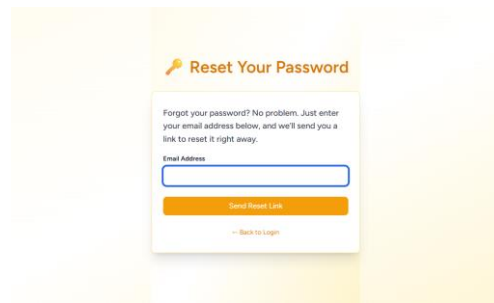
#	name	email	role	status	last login	actions
1	Admin HAP Studio	hataawang@gmail.com	Admin	Active	N/A	<a href="#">Edit</a> <a href="#">Delete</a>
2	Emily	emilyjordan30@gmail.com	Staff	Active	Clark	<a href="#">Edit</a> <a href="#">Delete</a>
3	Emilyna	emilynai@gmail.com	Customer	Active	N/A	<a href="#">Edit</a> <a href="#">Delete</a>
4	emilia	nordaniemily11@gmail.com	Customer	Active	N/A	<a href="#">Edit</a> <a href="#">Delete</a>

**Fig. 15 Staff Account Registration Interface**

Figure 16 shows the user sign-in interface. On the sign-in page, users are required to enter their registered email and password to be validated before logging in to the system. Also, there are two options displayed for users, such as a signup page link that redirects to the registration account form and the forgot password link that redirects to the process of resetting passwords by email, as shown in Figure 17.

**Fig.16 Account Registration User Interface**

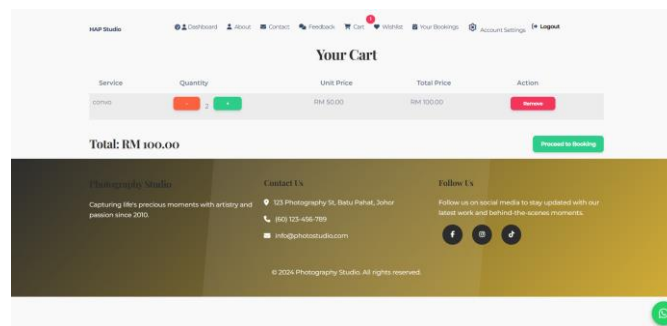
Figure 17 shows the reset password interface for the user who forgot their password. By entering their email, user can reset their password by setting up a new password through the link sent to their email.



**Fig.17** Reset Password Interface

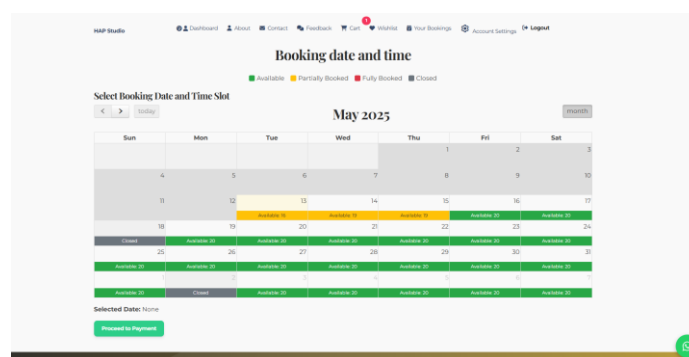
#### 4.1.2 Booking and Order Management Module

In the Booking and Order Management Module, customers can add service items to their cart and set the quantity before proceeding with booking and payment, as shown in Figure 18. Additionally, customers can save service items for later by adding them to a wish list.



**Fig.18** Customer's Cart Interface

To proceed with bookings, the customer must select the date and time slot for the booked services before proceeding with the payment process, as shown in Figure 19. The available slots are displayed on the calendar to indicate service availability. Additionally, the list of time slots is also displayed for the customer to select a booking time slot.



**Fig.19** Customer's Cart Interface

After customers book successfully, they can view their past bookings in the system, as shown in Figure 20. The list displays all the booking information, including the date, booking date, service image, service name, payment status, service status, and available actions. Also, customers can request a refund, cancel a booking, or view booking details.

No	Date	Booking Date	Service Image	Service Name	Payment Status	Service Status	Action
1	04 Mar 2025, 11:17 AM	04 Mar 2025		Self-Photo	Paid	In Progress	<a href="#">Cancel</a> <a href="#">View</a>
2	04 Mar 2025, 11:12 AM	04 Mar 2025		Corporate Photoshoot (Group)	Paid	In Progress	<a href="#">Cancel</a> <a href="#">View</a>
3	04 Mar 2025, 10:57 AM	04 Mar 2025		Self-Photo	Paid	In Progress	<a href="#">Cancel</a> <a href="#">View</a>
4	03 Mar 2025, 04:26 PM	28 Mar 2025		Family photo	Paid	In Progress	<a href="#">Cancel</a> <a href="#">View</a>
5	03 Mar 2025, 03:50 PM	07 Mar 2025		Graduation Photoshoot (Group)	Paid	In Progress	<a href="#">Cancel</a> <a href="#">View</a>

Fig. 20 Customer's Booking Interface

### 4.1.3 Services Management Module

In the Service Management Module, the administrator is responsible and able to create, edit, and delete service offers for the company. Figure 21 shows the list of the company's services, which is only visible to the administrator. The service list displays information such as the service name, service description, service price, and service image.

No	Service Name	Service Description	Service Price	Service Image	Actions
1	Combo	combo	50.00		<a href="#">Edit</a> <a href="#">Delete</a>
2	Self-Photo	self	50.00		<a href="#">Edit</a> <a href="#">Delete</a>
3	Corporate-Image	corporate-images	80.00		<a href="#">Edit</a> <a href="#">Delete</a>
4	Family photo	family photo	60.00		<a href="#">Edit</a> <a href="#">Delete</a>

Fig. 21 Service List Interface

### 4.1.4 Sales Management Module

In the Sales Management Module, the information from the database is retrieved to provide an overall summary of bookings, discounts, and payments. In the sales module, all data is formatted in a simplified representation to ensure the company's sales information is accurately displayed, including total earnings, total discounts, total bookings, and more. All the summary of the company's sales is displayed to allow the administrator to easily track and manage sales, as shown in Figure 22.

Sales Summary	
Expected Total Sales	RM 350.00
Last 30 Days	
Total Earned Sales	RM 50.00
Completed Bookings	

Fig. 22 Sales Summary Interface

### 4.1.5 Report Generation Module

Based on Figure 23, the interface shows the report generation process. To generate a report, the administrator or staff needs to select the report type (either a booking or sales report), the start and end dates, and provide a description. The report is then automatically generated based on the selected date range and displayed in the list.

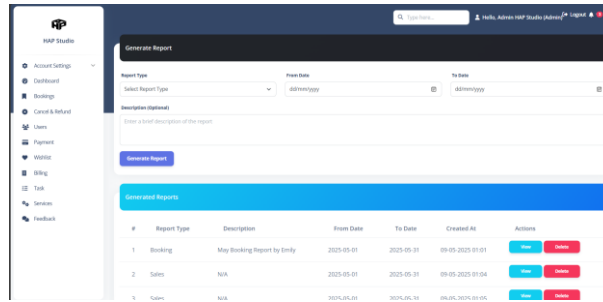


Fig. 23 Report Generation Interface

## 4.2 System Testing

In this section, there are two types of testing that are carried out, which are functional testing and user acceptance testing (UAT). Testing is conducted to evaluate the functionality, reliability, and performance of each module in the system. This testing process involves verifying whether administrators, staff, and customers can successfully interact with the system’s features, such as the booking and order management module, the service management module, the sales management module, and the report generation module. Figure 24 illustrates stakeholders independently using the system to perform functional testing and complete the UAT form.



Fig. 24 Stakeholder Testing

### 4.2.1 Functional Testing

Functional testing is a type of software test that verifies whether a system operates as expected and meets the specified requirements. It involves providing inputs, analyzing outputs, and ensuring the system functions correctly. Table 7 presents the test results for the developed system.

Table 7 Functionality test result

Function	Test Case	Expected Result	Result
Login and registration	Valid email and password.	A successful message will be prompted out, and the user will be redirected to the dashboard of the system.	Pass
	Invalid email and password.	An alert message displays, requiring the user to enter valid login credentials.	Pass
	Logout.	Redirect to the login page.	Pass
	Enter the user's email address, and a reset password form will be sent by email.	An email containing the reset password form has been sent successfully.	Pass
	Reset password.	Password has been reset successfully.	Pass
	View/create/update/delete users.	The users' list information will display.	Pass
	View/create/update/delete categories	staff The staff category list will display.	Pass
	Update personal details.	Information is successfully updated.	Pass

**Table 7:** (cont.)

Function	Test Case	Expected Result	Result	
Booking and order management	Change password with the correct current password.	The password has been changed successfully.	Pass	
	Change password with the wrong current password.	An alert message will display: password update failed.	Pass	
	Delete account	A successful message will be prompted, the account will be deleted successfully and the user will be redirected to the login page.	Pass	
	Available date.	Available date for the booking services indicates green colour, shows "Available" label, red colour shows "Fully Booked" label; else indicates yellow colour, shows "Closed" label.	Pass	
	Available time slots.	Available time slots for the services are displayed in the form of a list.	Pass	
	The booking history for the customer is displayed on the My Booking page.	A list of bookings with details is displayed.	Pass	
	Request a booking cancellation by entering the reason.	Display a pop-up window for the user to enter the cancellation reason.	Pass	
	Request a booking refund by entering the reason.	Display a pop-up window for the user to enter the refund reason.	Pass	
	Display booking details when click "View" button.	Details of the selected booking are displayed.	Pass	
	Add service items to the cart.	The selected service item has been successfully added to the cart.	Pass	
	Service items that are added to the cart are displayed on the Cart page.	The selected service item is successfully displayed in the cart list.	Pass	
	Add service items to the wish list.	The selected service item is successfully added to a wish list.	Pass	
	Service items that are added to the wish list are displayed on the Wishlist page.	The selected service item is successfully displayed in the wish list.	Pass	
	View/create/update/delete customer booking.	Customer booking list and information will display.	Pass	
	Service management	Select the "full" payment amount method.	The full payment amount will be displayed.	Pass
Select the "deposit" payment amount method.		The deposit payment amount will display.	Pass	
Valid discount code.		A successful message will be prompted, and a discount amount will be applied.	Pass	
Invalid discount code.		An alert message displays, indicating the discount code cannot be applied.	Pass	
View/create/update/delete services.		The service list and information will display.	Pass	
View/create/update/delete timeslots.		The timeslot list and information will display.	Pass	
Complete feedback information.		A successful message will be prompted.	Pass	
Incomplete feedback information.		An alert message will display; the user needs to input all the required information.	Pass	
Sales management Report generation		View sales summary.	Sales summary information will be displayed.	Pass
		View/delete the list of reports.	The report list and details will be displayed.	Pass
	Select report type.	The report type is shown in the input bar.	Pass	
	Select the start and end report dates.	The date selected is shown in the input bar.	Pass	
	Click the "Generate Report" button.	A report will be displayed in the list.	Pass	

### 4.2.2 User Acceptance Test

The User Acceptance Test (UAT) method is used to verify that the system meets user requirements and functions as expected. A UAT Form is utilized to evaluate test cases for the developed system, with responses collected from 10 respondents. Respondents are asked to complete a survey designed to assess their acceptance and satisfaction with the system. Some of the UAT results are presented in Figure 25. Figure 25(a) shows the user interface evaluation form completed by one of HAP Studio's staff members, Encik Hisham, who serves as a photographer. Figure 25(b) displays the functionality evaluation form, in which all items have been marked "Yes" and the form has been signed, indicating satisfaction with all aspects of the system's functionality.

**BAHAGIAN A- SOALAN ANTARAMUKA PENGGUNA**

Bahagian ini bertujuan untuk mendapatkan maklum balas daripada pentadbir, pekerja dan pelanggan mengenai antara muka pengguna sistem. Penilaian merangkumi isi kandungan, kemudahan pengguna, kejelasan teks, penggunaan grafik dan reka bentuk keseluruhan sistem.

Jawatan: (Sila pilih satu dengan tandakan /)

Bil	Jawatan	Pilih (/)
1	Pentadbir	
2	Pekerja-Jurugambar	/
3	Pekerja-Kerani	
4	Pekerja-Pembantu Pelanggan	
5	Pelanggan	

Soalan Umum: Sila tandakan (/) pada jawapan yang beresuaian.

1	Tidak Memuaskan
2	Memuaskan
3	Sederhana Baik
4	Baik
5	Sangat Baik

Bil	Perkara	1	2	3	4	5
1	Sistem yang dibangunkan adalah mesra pengguna.					/
2	Warna yang digunakan dalam sistem adalah sesuai.					/
3	Paparan sistem adalah menarik dan profesional.					/
4	Paparan teks dalam sistem mudah dibaca dan difahami.					/
5	Kedudukan paparan log masuk adalah sesuai dan mudah digunakan.					/
6	Penyampaian isi kandungan dalam sistem adalah menarik dan jelas.					/
7	Sistem ini mudah digunakan tanpa memerlukan latihan yang kompleks.					/
8	Pengguna boleh menjawab soalan atau mengisi borang dalam sistem dengan mudah.					/
9	Jenis tulisan yang digunakan dalam sistem adalah jelas dan mudah dibaca.					/
10	Ayat-ayat dalam sistem mudah difahami.					/
11	Saiz tulisan dalam sistem adalah sesuai dan konsisten.					/
12	Latar belakang sistem tidak mengganggu paparan kandungan.					/
13	Gabungan warna yang digunakan dalam sistem adalah harmoni dan menyenangkan.					/
14	Reka bentuk antaramuka sistem secara keseluruhannya adalah menarik dan moden.					/
15	Halaman log masuk dan pendaftaran					/

(a)

**BAHAGIAN B- FUNGSI SISTEM**

Bahagian ini menilai sejauh mana fungsi sistem memenuhi keperluan pengguna dalam aspek kebolehgunaan, ketepatan maklumat, keberkesanan, dan sokongan kepada pengurusan. Sila tandakan (/) pada jawapan Ya atau Tidak.

Bil	Soalan	Penilaian	
		Ya	Tidak
<b>KEBOLEHGUNAAN</b>			
1	Kesemua butang berfungsi	/	
2	Sistem ini mudah digunakan	/	
3	Sistem memberikan tindak balas dengan pantas terhadap arahan.	/	
4	Sistem memberikan mesej pengesahan selepas sesuatu tindakan diselesaikan	/	
<b>KUALITI MAKLUMAT &amp; KETEPATAN DATA</b>			
1	Maklumat tentang pengurusan perniagaan mencukupi	/	
2	Sistem ini membantu dalam memberikan maklumat dengan lebih mudah kepada pentadbir dan pekerja	/	
3	Sistem membolehkan akses kepada maklumat penting pada bila-bila masa	/	
4	Maklumat daripada pangkalan data adalah benar seperti yang dipaparkan ke dalam sistem	/	
5	Sistem menyediakan laporan yang berguna untuk tujuan membuat keputusan.	/	
<b>KEBERKESANAN FUNGSI SISTEM</b>			
1	Sistem ini dapat membantu pengguna dalam pengurusan perniagaan	/	
2	Sistem ini tidak mempunyai ralat	/	
3	Sistem menyimpan dan mengurus data pelanggan serta transaksi dengan teratur	/	
4	Sistem membolehkan kemas kini maklumat dilakukan dengan mudah dan cepat.	/	
<b>SOKONGAN KEPADA PENGURUSAN PERNIAGAAN</b>			
1	Sistem mempertingkatkan pemantauan jualan dan pengurusan kewangan	/	
2	Sistem meningkatkan kecekapan dalam pengendalian tempahan dan pesanan	/	

Komen/Cadangan:

Boleh tambah paparan nombor di navigation bar (cart) supaya mudah untuk pengguna mengetahui jumlah barang yang ada didalam cart mereka iaitu lebih mesra pengguna.

Tandatangan dan Cop (jika ada):



Tarikh: 21 APRIL 2025

(b)

**Fig. 25** User Acceptance Test Result (a) Evaluation of System Interface; (b) Evaluation of System Functionality

The system implementation and testing phase is crucial for ensuring that the designed solution functions as intended. This phase not only involves programming the system but also rigorously testing it to identify and resolve any issues. Effective implementation ensures that all components integrate smoothly, while thorough testing validates the system's performance, reliability, and user satisfaction. By addressing potential challenges early, we can enhance the overall quality of the system and ensure it meets the specified requirements, ultimately leading to successful deployment.

### 5. Conclusion

In conclusion, the development of the photography studio information management system has been completed. The various modules provided have significantly streamlined the work processes for customers, administrators, and staff at HAP Studio. Customers can access detailed service information, reserve time slots, and manually pay via online banking or QR codes. Administrators can efficiently manage studio operations, enhancing data management and overall performance. Staff members can also handle booking operations more effectively within a unified platform. By leveraging a combination of computer technology, information systems, databases, and internet technologies, HAP Studio can store data more efficiently, optimize business operations, and improve communication between staff and administrators, as well as generate reports, offering the advantages of long-term data retention and simplifying the customer experience.

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## Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

## Author Contribution

This journal requires that all authors take public responsibility for the content of the work submitted for review. The contributions of all authors must be described in the following manner:

The authors confirm contribution to the paper as follows: **study conception and design:** Nordini Emily, Nureize; **data collection:** Nureize; **analysis and interpretation of results:** Nordini Emily, Nureize; **draft manuscript preparation:** Nureize. All authors reviewed the results and approved the final version of the manuscript.

## References

- [1] H. P. Adhi and Tinuk, "Photography service booking system," *Formosa Journal of Computer and Information Science*, vol. 2, no. 2, pp. 195–208, 2023. [Online]. Available: <https://doi.org/10.55927/fjicis.v2i2.5588>
- [2] J. Yu, J. Zhao, C. Zhou, and Y. Ren, "Strategic business mode choices for e-commerce platforms under brand competition," *Journal of Theoretical and Applied Electronic Commerce Research*, vol. 17, no. 4, pp. 1769–1790, 2022.
- [3] M. A. Abd Ghani and Z. Darawi, "Transformasi dan prestasi perniagaan usahawan Melayu perusahaan kecil dan sederhana (PKS) di Johor Bahru," *Prosiding Persidangan Kebangsaan Ekonomi Malaysia Ke VII*, p. 697, 2012.
- [4] I. P. Rachmadewi and H. Purnomo, "The role of e-commerce: A systematic literature review," *International Journal of Interactive Mobile Technologies (IJIM)*, vol. 16, no. 13, p. 119, 2022.
- [5] Jabatan Perangkaan Malaysia, *Laporan Survei Pendapatan Isi Rumah & Kemudahan Asas 2019*. Jabatan Perangkaan Malaysia, 2020. [Online]. Available: [https://www.dosm.gov.my/v1/index.php?r=column/cthemByCat&cat=120&bul\\_id=TU00TmRhQ1N5TUxHVWN0T2VjbXJYZz09&menu\\_id=amVoWU54UTl0a21NWmdhMjFMMWcyZz09](https://www.dosm.gov.my/v1/index.php?r=column/cthemByCat&cat=120&bul_id=TU00TmRhQ1N5TUxHVWN0T2VjbXJYZz09&menu_id=amVoWU54UTl0a21NWmdhMjFMMWcyZz09)
- [6] M. A. Kumar, D. A. A. Syed, and D. A. Pandey, "Impact of online resources/technology adoption on SMEs performance," *PIMT Journal of Research*, 2020.
- [7] D. Novaliendry and N. D. Putri, "Design and build a photo studio marketplace using the CodeIgniter framework," *Jurnal Teknologi Informasi dan Pendidikan*, vol. 14, no. 1, pp. 18–26, 2021.
- [8] H. B. Siri, M. Z. B. Khairani, and H. B. Halim, "Digital photography and the future of photography culture," *International Journal of Applied and Creative Arts*, vol. 5, no. 1, pp. 13–22, 2022.
- [9] X. He, Y. Qiu, and Y. Bai, "Evaluating entrepreneurial opportunity in the new photography market," in *Proc. 2022 Int. Conf. Social Sciences and Humanities and Arts (SSHA 2022)*, Apr. 2022, pp. 1079–1086.
- [10] C. Vincent, *Kathrine Thomas Photography: A Business Rebrand*, Master's thesis, Salem State University, 2021. [Online]. Available: <https://digitalrepository.salemstate.edu/handle/20.500.13013/2225>
- [11] J. Zhang, W. Zheng, and S. Wang, "The study of the effect of online review on purchase behavior: Comparing the two research methods," *International Journal of Crowd Science*, vol. 4, no. 1, pp. 73–86, 2020.
- [12] S. K. Khamis, F. B. M. Ariffin, N. S. M. Sahaib, and F. I. Omar, "Faktor-faktor mempengaruhi tingkah laku pembelian dalam talian dalam kalangan mahasiswa KUIS," 2020.
- [13] O. A. Adetunji, S. A. Idowu, and A. A. Izang, "Web-based information system (WBIS) framework: Facilitating interoperability within business ventures," *International Journal of Computer Applications*, vol. 975, p. 8887.
- [14] R. Rizdania, S. H. Riono, P. U. Rakhmawati, and R. Darmayanti, "Interns: Mentoring and counseling on the software development process," *Jurnal Inovasi dan Pengembangan Hasil Pengabdian Masyarakat*, vol. 1, no. 1, pp. 22–29, 2023.
- [15] F. Aulia, I. Yasin, Y. Rahmanto, and R. Trialih, "Web-based petroleum sales accounting information system," *Jurnal Ilmiah Sistem Informasi Akuntansi*, vol. 2, no. 2, pp. 77–81, 2022.
- [16] C. Dongsheng, H. Yan, and Z. Mengqian, "Research on operation scenario based aircraft power system architecture analysis and modelling," in *E3S Web of Conferences*, vol. 271, p. 01017, 2021.