

Bouma Studio: A Web Solution for Encapsulated Moments in Motion

Farisha Qistina Razak
Universiti Kuala Lumpur
Malaysian Institute of Information Technology
50250 Kuala Lumpur
farisha.razak@s.unikl.edu.my

Juliana Jaafar*
Universiti Kuala Lumpur
Malaysian Institute of Information Technology
50250 Kuala Lumpur
jjuliana@unikl.edu.my

*Correspondent author: jjuliana@unikl.edu.my

Abstract—The web application, Bouma Studio, aims to overcome the challenges of service management for its potential customers by providing a seamless platform to access package information and prices, browse the photography portfolio, book packages, and receive updates about quotations and invoices. Key challenges identified include inefficient reservation processes, reliance on studio admin efforts to find freelancers online, and difficulty for customers in accessing Bouma Studio’s information, leading to missed reservations. To address these issues, the project involved studying customer and administrator requirements, designing, and implementing a web application using an iterative model. The methodology included interviews with the three directors of Bouma Studio and 19 previous and potential customers for context analysis, followed by evaluations using questionnaires and interviews. The findings show that the system significantly reduced the time spent searching for online photographers by 83.52%, improved access to package information by 90%, and enhanced the efficiency of receiving quotations and invoices by 100%, resulting in an improved overall booking experience.

Keywords—web application, service management, book packages, administrators, quotations and invoices, booking experience

I. INTRODUCTION

In the dynamic world of photography and videography, skill, creativity, and passion are essential, but effective marketing is crucial for recognition. The rise of online e-commerce, especially in places like Thailand, highlights the power of modern marketing technology and social media platforms like Facebook and Instagram. These tools help entrepreneurs build online presences despite competition from large corporations. The increasing number of freelancers underscores their growing significance in the economy [1], offering benefits like flexible schedules and global work opportunities [2]. In today’s digital age, a user-friendly booking system for photography and videography services is vital. Such a system streamlines the process for customers by providing detailed package and pricing information, portfolios, and booking services. It also enables freelancers to showcase their skills, connect with potential clients, and improve revenue for Bouma Studio.

A. Project Background

Bouma Studio, established in 2021 in Ampang, Kuala Lumpur, initially relied on word-of-mouth and Instagram for

promotion. However, Instagram’s limitations hindered showcasing longer videos and high-quality images, and communication with clients was challenging. To address these challenges and expand its reach, This project aims to help Bouma Studio by envisioning the creation of a comprehensive web system This platform would offer potential customers detailed information about services, including feedback from previous clients, fostering transparency and trust. Specifically tailored to the needs of Bouma Studio’s owner, the web system aimed to revolutionize the customer experience, providing a seamless and organized booking process while streamlining administrative tasks.

B. Problem Statements

The problem statement identifies three key challenges:

- 1) The current chat-based reservation system at Bouma Studio is inefficient, causing delays and inconvenience for clients who need to communicate directly with the admin to make bookings.
- 2) Bouma Studio’s manual online search method limits collaborative opportunities for freelancers, relying on the admin to find freelancers online and restricting creative contributions for projects.
- 3) Prospective clients encounter difficulties accessing information about Bouma Studio’s services, resulting in missed opportunities for reservations.

C. Objectives

The project objectives are:

- 1) To analyze the current challenges in reserving photography and videography services with Bouma Studio and identify shortcomings in existing solutions within the company’s operational framework.
- 2) To design and improve the system for seamless freelancer collaboration, expanding creative contributions and job opportunities at Bouma Studio. The focus is on creating a user-friendly website interface that makes it easy for users to explore, book, and customize photography and videography services seamlessly.
- 3) To validate the functionalities of Bouma Studio system by conducting system and user acceptance testing after the system is completed.

II. LITERATURE REVIEW

The literature review explores the transformative impact of web applications on service booking, specifically addressing two main areas: the feasibility of shifting from manual Instagram booking processes to an efficient web-application approach, and how these systems contribute to the growth of freelance photography opportunities. It highlights how streamlined online booking services enhance customer satisfaction through time savings and improved efficiency. Furthermore, it investigates the benefits for freelance photographers, including increased access to job opportunities and collaborative projects.

A. Perspectives on Freelancers Services

Freelancing encompasses diverse roles such as contract workers or portfolio workers, characterized by autonomy and short-term client relationships [3]. Initially viewed as temporary and low-skilled, freelancers now include highly specialized "talents" valued for their expertise in innovation and strategic roles [4]. Unlike traditional perceptions, these freelancers are sought after for their unique skills rather than as cost-saving measures. Despite concerns about online labor markets, skilled freelancers are increasingly recognized for their contributions to specialized projects and are well-compensated for their expertise [5].

B. Perspectives on Photography and Videography Services

Visual content, such as photography and videography, holds immense power, conveying complex emotions and messages more effectively than words alone. In Malaysia, the photography and videography industry is thriving, contributing significantly to both direct and indirect economic impacts. Professional media services have been shown to substantially enhance business performance, with examples like a sporting equipment store seeing over 300 percent growth upon using professional photos. Corporate videography, according to Martin et al. (2006), brings market segments to life and effectively communicates insights into consumers' lives. Social media plays a crucial role in facilitating customer access to photography services, as highlighted by a survey indicating that 42.1 percent of customers discover photographers through search engines and social media platforms. [6]

C. Overview of Existing Photography and Videography System

Existing systems like CK Chun Photography, My Little Moana Photography, and Booking a Photographer highlight the need for a comprehensive service management system tailored for photography and videography services. Such a system would integrate features for efficient reservation management, freelancer collaboration, and easy access to package information. Implementing this system at Bouma Studio would enhance efficiency, improve customer experience, streamline freelancer collaboration, and elevate service quality.

1) *CK Chun Photography*: CK Chun, a leading wedding and engagement photography service in Malaysia, uses Smug- Mug for its online portfolio. The website showcases various photography categories with a blog for insights and features direct WhatsApp communication for inquiries. However, the absence of a pricing list and customer feedback limits transparency and potential client engagement. Addressing these areas could enhance user experience and broaden CK Chun's clientele.

2) *My Little Moana Photography*: Established in 2023 in Kuala Lumpur, Malaysia, My Little Moana Photography is known for its diverse portfolio capturing events from family gatherings to corporate affairs. Led by Roman and his team, the website offers easy navigation for exploring occasion-specific photography options with transparent pricing. Integration with their YouTube channel enhances the user experience, though improvements like enhancing navigation visibility and adding a portfolio section could further enrich engagement and showcase their creative expertise effectively.

3) *Booking a Photographer*: The "Booking a Photographer" system streamlines hiring skilled photographers through a curated database, ensuring quality with vetted professionals. Clients navigate easily from location selection to booking confirmation, exploring portfolios and specifying shoot details. However, usability challenges include interface clarity and freelance submissions. Clearer buttons and streamlined processes would enhance functionality and user experience.

4) *Comparisons of the Existing System with Proposed System (Bouma Studio Website)*: -

TABLE I: Comparisons of the Existing System with Proposed System (Bouma Studio Website)

Features	CK Chun Photography	My Little Moana Photography	Booking A Photographer	Bouma Studio
Registration	No	No	No	Yes
View Price Listing	No	Yes	No	Yes
View Portfolio	Yes	No	Yes	Yes
Booking Form	No	No	Yes	Yes
Freelancer Form	No	No	No	Yes
Admin Login/Logout	Yes	No	No	Yes
Admin View the Booking Submission	No	No	Yes	Yes
Admin Update User's Booking Process	No	No	No	Yes
Admin Send the Generated Quotation and Invoice to User's Dashboard	No	No	No	Yes

The exploration of photography and videography book-

ing systems highlights the foundational benefits for Bouma Studio's proposed system, aiming to streamline reservation and service selection processes to save time for users. Beyond enhancing user experience, the project aims to empower freelancers by providing a platform for showcasing talents and fostering collaboration. Drawing from insights on existing systems like CK Chun Photography, My Little Moana Photography, Booking a Photographer, Bouma Studio ensures efficiency and seamless integration in line with its goals. This commitment underscores Bouma Studio's pursuit of setting new standards in the industry, benefiting both clients and freelancers through innovative features and continuous improvement.

III. METHODOLOGY

The methodology used in this study adopts an iterative approach to ensure thorough data collection and analysis, incorporating detailed interviews and a structured questionnaire.

A. Context Analysis

This section details the process of gathering requirements for the web application, which involved researching similar web applications as discussed in the literature review and gathering direct input from potential users.

1) *Literature Review*: The literature review analyzed existing photography booking systems to identify common features and potential areas for improvement. This served as a basis for determining the essential components that the new web application should incorporate to align with user expectations.

2) *Interviews with Focus Group*: Interviews were conducted with a focus group consisting of 3 directors of Bouma Studio and 19 previous and potential clients, selected through purposive sampling to ensure diverse representation across different factors such as age, gender, professional background, and event type. These interviews aimed to collect detailed feedback on the specific needs and challenges faced by customers in accessing information about Bouma Studio services, as well as by administrators in managing booking requests seamlessly.

B. Design and Implementation

This section details the design and implementation phases of the web application, highlighting the iterative approach employed to enhance the application based on user feedback.

1) *Iterative Model*: The iterative model was selected to facilitate ongoing enhancements of the mobile application prototype. Each cycle involved refining the prototype, gathering user feedback, and implementing necessary adjustments. This iterative approach ensured that the application continuously improved to better align with user requirements and resolve identified issues during testing.

C. Web Application Evaluation

This section outlines the evaluation phase of the web application, focusing on assessing its effectiveness in tackling the identified challenges.

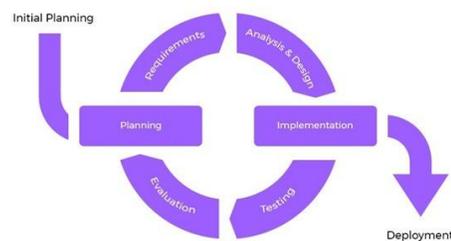


Fig. 1: Iterative Model

1) *Development of Questionnaire*: A structured questionnaire was devised to evaluate the usability and effectiveness of the web application. It included:

- 8 closed-ended questions using a 6-point Likert scale to quantify user satisfaction and usability.

2) *Data Collection and Analysis*: The questionnaire was administered to two distinct groups: a focus group comprising 3 directors of Bouma Studio, who were initially interviewed, and 19 cafe owners interviewed separately.

The collected data for students was analyzed to assess the application's impact on:

- Decreasing the time spent searching for photographers for an event.
- Accessing pertinent information about the services offered.
- Enhancing the overall booking service experience.

Insights from interviews were gathered to understand the perspectives of Bouma Studio administrators:

- Their satisfaction with the platform's handling of booking requests from customers.
- How the platform has enhanced visibility with potential customers and increased revenue.
- Suggestions for further enhancements to better align with their business needs.

The iterative process of the study enabled continuous refinement and re-evaluation of themes, ensuring the reliability and validity of the analysis.

IV. RESULTS AND FINDINGS

The results and findings of this study are divided into three main sections: Stakeholder Insights, Design and Implementation, and Web Application Effectiveness. These sections present the outcomes of the methodologies used and provide insights into the effectiveness of the web application developed.

A. Context Analysis

The first phase of the study centered on comprehending the specific needs and challenges encountered by past and prospective clients of Bouma Studio in relation to booking

services. Below is a summary of the findings derived from the literature review and focus group interviews.

1) *Focus Group Feedback:* Interviews conducted with a varied group comprising 3 directors of Bouma Studio and 19 past and prospective customers of Bouma Studio covered several significant challenges:

For Customers:

- **Challenges in accessing pricing and package details:** Customers expressed frustration due to the difficulty in accessing detailed information about packages and prices. They noted that waiting for the administrator to respond to each inquiry was time-consuming and cumbersome, highlighting the inefficiency of the current online booking system.
- **Difficulty in browsing photography portfolios:** Customers find it challenging to access and review previous work portfolios due to infrequent updates by the Instagram administrator, hindering their booking decisions.
- **Time-consuming wait for quotations and invoices:** Customers experience delays of several days before receiving their quotations and invoices, resulting in frustration and inefficiency in the booking process.

For Administrator:

- **Quotation and invoice generation delays:** Creating quotations and invoices is time-consuming for administrators at Bouma Studio, who currently manually gather details from Instagram to fill out these documents. They expressed a strong desire for a dedicated system that automates this process, streamlining the creation of quotations and invoices for each customer.
- **Difficulty in tracking activities:** Administrators struggle to maintain real-time updates on quotations and invoices, often losing track of pending tasks. They seek a system that can efficiently track and provide real-time updates on new tasks.”

Based on these insights, the development of the web application was guided to address the main challenges identified by both customers and administrators.

B. Design and Implementation

The iterative approach employed in designing and implementing the application facilitated ongoing feedback and enhancement. This section outlines the system architecture, use cases, database design, and key interfaces that were developed.

1) *System Architecture:* The system architecture of the Bouma Studio web application is crafted to prioritize scalability, reliability, and streamlined online booking services. It consists of the following key components:

- **Customer-Side Web Application:** Implemented with PHP and JavaScript to ensure optimal performance across diverse devices.
- **Functionality:** Includes features for user authentication, quotation and invoice generation, and collaboration with freelancers.

- **Database:** Utilizes MySQL to efficiently manage and retrieve user data, booking details, quotation and invoice records, as well as package and pricing information.

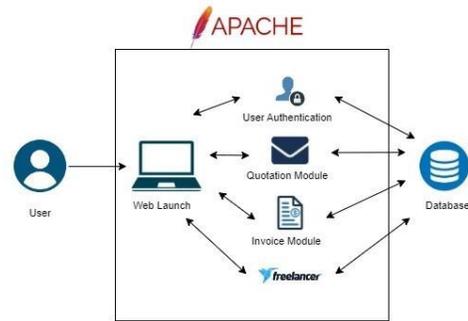


Fig. 2: System Architecture

2) *Use Case Diagram:* This diagram outlines the interactions between system users (including customers, freelancers, and administrators), emphasizing the core functionalities and interactions within the system.

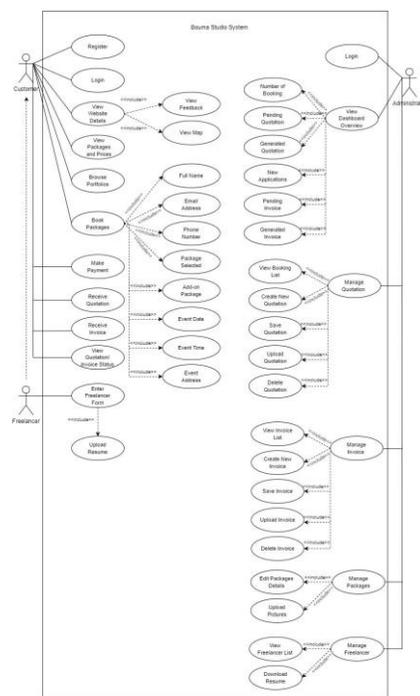


Fig. 3: Use Case

3) *Database Design:* The database design encompasses tables for administrators, users, bookings, packages, invoices, quotations, files, freelancers, and payments. Each table is meticulously structured to uphold data integrity and facilitate efficient information retrieval. The entity-relationship (ER) diagram provided illustrates the schema of the database:

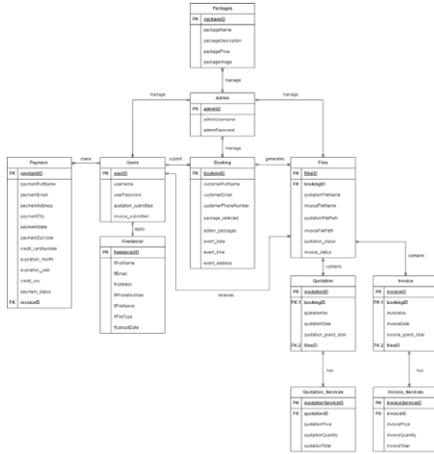
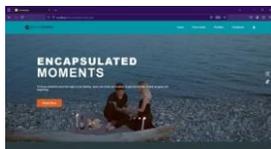


Fig. 4: ER Diagram

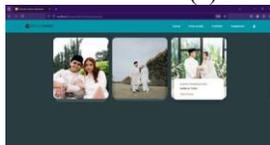
4) **Core Interfaces:** The core interfaces of the web application application include:



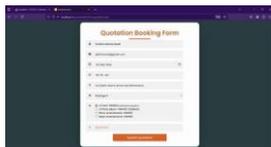
(a) Home Screen



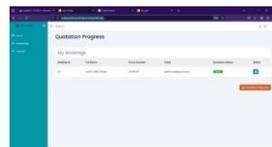
(b) Packages and Prices



(c) Portfolio Photography



(a) Booking Form



(b) Quotation Progress



(c) Freelancer Form

- **Home Screen:** Displays information about Bouma Studio.
- **Packages and Prices:** Provides detailed packages information, including prices, and service descriptions
- **Photography Portfolio:** Allows customers to browse through previous photography work.

- **Booking:** Enables customers to book their chosen packages.
- **Quotation Progress:** Enables customers to track their quotation progress.
- **Freelancer:** Enables freelancer to apply for job.

C. **Application Effectiveness**

The final evaluation focused on assessing the web application’s effectiveness in addressing identified challenges and enhancing the overall seamless booking management experience for both customers and administrators.

1) **Questionnaire Results:** The structured questionnaire given to the focus group provided quantitative data on the web application’s effectiveness.

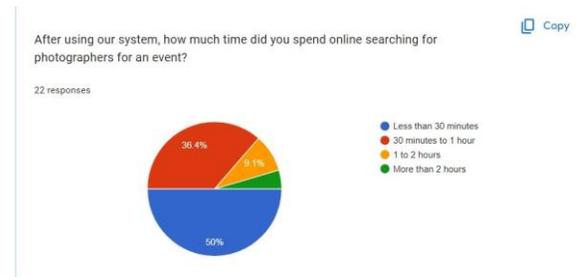


Fig. 7: Reduction in Time Spent Chart

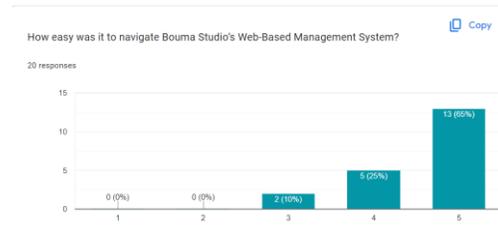


Fig. 8: Ease to Access Information Chart



Fig. 9: Ease to Access Information

- **Reduction Time Spent Searching for Online Photographers:** 83.52% of participants reported a significant reduction in time spent searching for online photographers.
- **Ease of Access to Packages Information:** 90% of participants found it easier to obtain detailed information about packages and prices.
- **Receive Accurate Quotation:** 100% of participants stated that the received quotations accurately reflected their booking requests.

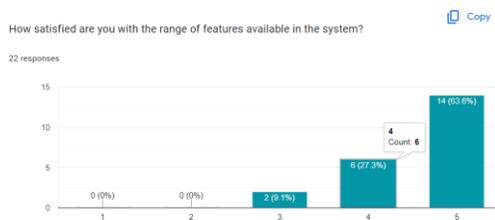


Fig. 10: Overall User Satisfaction Chart

- **User Satisfaction:** Overall user satisfaction was rated at an average of 4 out of 5 on the Likert scale.

2) *Qualitative Feedback:* In addition to the quantitative data, qualitative feedback was also gathered:

- **Areas for Improvement:** Some customers and administrators have suggested incorporating additional features, such as integrated payment options and developing a mobile application.

Overall, the results indicate that the web application successfully tackled key customer challenges and enhanced business operations for administrators, greatly improving the overall online booking experience.

V. DISCUSSION

A. Interpretation of Results

Interpretation of Results

The study yielded promising results, demonstrating an impressive 83.52% reduction in the time customers spend searching for online photographers. This significant decrease underscores the web application's effectiveness in addressing the issue of time wastage due to inefficient booking process.

B. Reflection on Literature Review

Reflecting on the literature review, it is clear that web applications play a crucial role in enhancing online booking experiences. Existing photography booking platforms such as CK Chun Photography, My Little Moana Photography, and Book a Photography offer features such as access to package and pricing information, location details, and user reviews, which enhance convenience and decision-making for customers. However, a recurring issue that persists is the inefficiency and time wasted when customers have to wait for responses to their inquiries.

C. Addressing the Identified Problem

The problem of customers wasting time waiting for responses to their inquiries is a significant concern. Customers have limited time to find and compare packages prices. Although existing systems are thorough in many aspects, they frequently lack real-time updates on booking progress. This gap can lead to frustration among customers.

D. Advantages of Proposed Web Application

The web application addresses this issue more effectively than existing solutions by generating auto-generated quotations. It also provides real-time updates on the quotation status, enabling customers to monitor progress. This allows customers to stay informed about their booking status and make timely decisions.

VI. CONCLUSION AND RECOMMENDATION

A. Conclusion

The Bouma Studio web solution, "Encapsulated Moments in Motion," effectively meets customer and administrator needs. It successfully achieves project goals by allowing easy booking, viewing of package details and prices, and real-time updates on quotations and invoices. Customers save time finding photographers, while administrators efficiently manage bookings and ensure customer satisfaction. The system's intuitive interface and comprehensive features make it a vital tool for enhancing the booking experience.

B. Recommendation

While the application has demonstrated significant potential, there are several suggestions for future development and research to further improve its effectiveness and user satisfaction:

1) Enhanced Features:

- **Payment API Integration:** Integrating a payment API feature allows customers to securely make online payments conveniently.
- **Mobile Application Development:** Developing Bouma Studio: A Web Solution for Encapsulated Moments in Motion as a mobile application enhances accessibility and convenience. This enables customers to easily navigate and access the system using their smartphones, streamlining the booking process and access to related information.
- **Notification System:** Implementing a notification feature ensures customers receive timely updates on quotations and invoices. This feature keeps customers informed, enhances their overall experience with the system, and improves communication efficiency.
- **Tracking Freelancer and Photographer Hours:** Introducing a feature to track freelancer and photographer working hours provides administrators with insights into resource allocation and project management. This feature enhances operational transparency and facilitates accurate billing and scheduling.

Based on thorough analysis and research, Bouma Studio's web solution for encapsulated moments in motion has been successfully developed within the projected timeline. Moving forward, there is significant potential for further enhancements and ongoing refinement of the project. The system promises substantial benefits for customers seeking event photographers. By introducing new features and improvements, it can expand its capabilities and serve a wider audience, increasing its overall utility and impact.

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