Bangka Explorer: *Ultimate Travel and Tour* Booking System

King John D. Baylon[1], Glen P. Baylon[2], Kenith B Cobrador[3], Jayson P. Celis[4], Dilex P. Dapilaga[5], Markgil G. Villa[6], Nelson E. Baito[7] and Reina Del B. Blancaver[8]

[1,2,3,4,5,6,7,8]Norther Iloilo State University-Batad Campus,
[8]blancaverreinadel515@gmail.com

***Abstract*--** The main purpose of this study was to provide a convenient and easy-to-use platform for the passenger booking system. We proposed, designed, and developed an online-based booking system known as Bangka Explorer: Ultimate Travel and Tour Booking System, which offered an efficient solution for managing passenger bookings, boat schedules, and payments. It also ensured clear communication among passengers, boat owners, and the administrator. The system integrated real-time SMS notifications to update users about booking statuses, schedule changes, and other relevant information. It supported online payment methods such as PayMaya and GCash, providing a convenient and secure alternative to cash transactions. Through its user- friendly interface and streamlined processes, the system enhanced the travel experience, minimized manual errors, and saved time for both passengers and administrator.

System obtained an overall mean score of **6.38**, which was interpreted as *excellent*. This result highlighted the system's strong capability and resilience in handling booking transactions, including data storage, management, and validation. Respondents confirmed that the system operated reliably, maintained data accuracy and accountability, and was designed with a structure that supports both easy maintenance and potential future enhancements. The successful implementation of the system improved the efficiency and reliability of booking procedures, making it a valuable tool for the community at Bancal Port in Carles, Iloilo, and contributing to the smooth operation of future tourism initiatives.

***Keywords*—**Bangka, Explorer, Booking System, Travel, Online Payment

I. INTRODUCTION

The development and operations of an effective booking system for a convenient and hassle free transactions are significant to the passengers. The growth of the travel and tourism industry has been significantly influenced by advancements in technology, particularly in how trips are planned and managed. Traditional methods of booking travel arrangements such as visiting physical offices or making phone calls are often time- consuming and inconvenient for both travellers and service providers. With the increasing demand for faster, easier, and more reliable solutions, the development of online travel and tour booking systems has become essential (Buhalis, D., & Law, R., 2008).

The Municipality of Carles was abundant in beautiful white beaches that attracted many tourists, especially to popular islands such as Gigantes Island. At Bancal Port in Carles, Iloilo, boat rental transactions and reservations were still conducted manually. This process caused inconvenience due to long queues and waiting times for passengers seeking boat rentals to their desired destinations. There was also a lack of notification updates regarding unexpected booking cancellations, boat and seat availability, and the collection of passenger information required by the coast guard in case of unforeseen incidents during travel. Additionally, planning and booking trips online was considered risky due to the prevalence of scamming issues. Organizing travel plans, comparing options, and managing reservations were time-consuming tasks that failed to effectively cater to the needs and preferences of the passengers.

We found an opportunity to address these issues by developing an online-based booking system that provided an easy-to-use platform where passengers could browse destinations, book tours, reserve transportation, receive real-time updates, and make payments—all from a single interface. By offering a convenient and accessible digital solution, the system enhanced the overall travel experience, reduced the manual workload, and helped bridge the gap between passengers and tour operator in a more efficient and modern way. The available bookings were limited to nearby tourist destinations within the vicinity of Carles, Iloilo.

A. Conceptual Framework

The Bangka Explorer described how the system functioned from start to finish. In the input stage, users provided details such as registration information, booking preferences, and payment data, while administrator managed tour packages and system settings. During the process stage, the system handled user authentication, tour browsing, secure payment processing, and administrative operations such as package updates and report generation. The output stage delivered booking confirmations.

Related Works

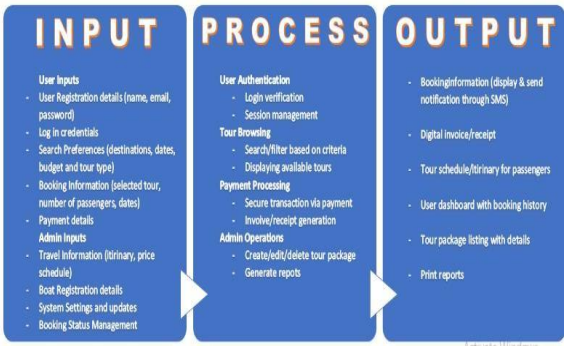
In [2], he stated that travellers can evaluate boat services offered by various travel agencies and identify the finest and most reasonably prices options available. This system can assist tourism in handling boat services and reservations. Travellers can choose the boat service they want to use to verify the availability of tickets and make

direct reservations. His paper described a web- based system for tourists and travel agencies to save important data in the database, like reservations tickets and payments.

In [3], he conducted a study evaluating the effectiveness of online travel booking platforms that findings emphasized that ease of use, real-time booking capabilities and system reliability were key factors in user satisfactions. Their study recommended the development of optimized booking system that still offer core functionality.

In [4], they developed a web-based tour booking and management system specifically for a local travel agency. The system allowed customers to view available tours, book online, and receive automated email confirmations. On the administrative side, it provided tools for managing bookings, customer records, and tour schedules significantly improving the agency's efficiency and customer experience. Technological Institute of the Philippines.

In [5], they developed a mobile-based application that tailored for domestic tourism. Their study aimed to provide an accessible platform for users to book local tour packages, view destinations, and receive instant updates about their reservations. The researchers emphasized the digital receipts, travel itineraries, user and admin dashboards, tour listings, user reviews, and analytical reports. This framework ensured a smooth, efficient, and user-friendly travel booking experience.



A. Objectives of the Study

The primary objective of the Bangka Explorer: Travel and Tour Booking System was to provide an online platform for passengers to register, view tour package information, book tickets, make payments, and search for available tours efficiently. The system aimed to facilitate easy access to travel services for passengers while enabling administrator to effectively manage users, tour packages, destinations, and payment details.

Specifically, it aims to:

1. Design an online-based platform that:

a. Manage comprehensive information related to bookings, passengers, and boats efficiently and accurately.
b. Showcased popular tourist destinations to assist users in selecting tours.
c. Generated filtered reports on payments and ticket sales for better tracking and analysis.
d. Sent SMS notifications to ensure clear and timely communication about booking status.
e. Reduced the time required for transactions to improve overall booking efficiency.
f. Supported multiple online payment methods, including Pay Maya and Gcash, for passenger's convenience.

2. Evaluated the system's quality using:

a. ISO/IEC 25010 software quality model to assess functionality, reliability, and maintainability,

b. Computer System Usability Questionnaire (CSUQ) to determine system usability, ease of use, and user satisfaction.

II. METHODOLOGY

A. Research Design

The Bangka Explorer: Ultimate Travel and Tour Booking System adopted a descriptive-developmental approach, combining the analysis of existing booking system with the actual development of a web-based platform tailored for Bangka Island's tourism. It involves gathering data through interviews with the tour operator of the establishment, and observations to identify user needs and system requirements.

The study utilized **purposive sampling** to select respondents who are directly involved in by travel and tour booking processes in Bangka. This includes local and foreign passengers with travel experience, local tour operator who manage tour packages, and system administrator with relevant technical knowledge. These respondents were chosen based on their ability to provide valuable, experience-based insights that are essential for the development and evaluation of the *Bangka Explorer* platform. This method ensures that the data collected is relevant, specific, and aligned with the objectives of the study. The participants of the study included random 86 passenger's (local and foreign tourists), 1 tour operator, 10 boat owners, and 3 IT professionals who were selected to evaluate the proposed interface's usability and performance.

B. System Design

B.1 System Development Life Cycle

In this study, the Rapid Application Development (RAD) was used for explaining and understanding the users need, and transfer through the four phases namely; requirements planning phase, the user design phase, the rapid construction, and the cutover phase.

The software development lifecycle (SDLC) was the

cost-effective and time-efficient process that development teams use to design and build high-quality software. The goal of SDLC is to minimize project risks through forward planning so that software meets customer expectations during production and beyond. This methodology outlines a series of steps that divide the software development process into tasks you can assign, complete, and measure.

Figure 2 illustrates the Software Development Life Cycle (SDLC) model the researchers' methodical approach in developing the system.

Figure 2. RAD (Rapid Application Development).

The RAD (Rapid Application Development) model in SDLC (Software Development Life Cycle) is an iterative and adaptable approach that emphasizes rapid prototyping and user feedback to build applications quickly. It focuses on delivering working software through continuous cycles of prototyping, testing, and refinement, with less emphasis on rigid planning upfront.

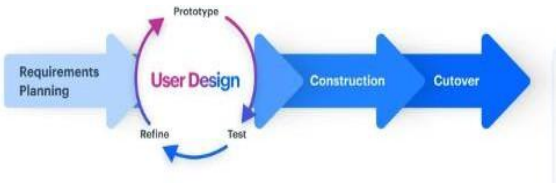


Figure 3. Rapid Application Development Model

C. *System Architecture*

The proposed system was design using the three-tier architecture consisting of the Presentation Layer**,** Application Layer**,** and Database Layer. This structure ensures modularity, scalability, and ease of maintenance. The Presentation Layer serves as the front-end interface that users interact with. It includes web and mobile interfaces designed for both passengers and administrator. Passengers can search tourist destinations and book tour, register or log in to their accounts, and view their bookings. Administrator use this layer to manage listings, monitor transactions, and perform maintenance tasks. Technologies used in this layer often include HTML, CSS, JavaScript and frameworks like telerivet gateway for SMS notification. The Application

Layer, also known as the business logic layer, acts as the core of the system. It processes user requests, applies booking rules, handles authentication, manages transactions, and communicates with external services such as payment gateways using Pay Maya and GCash. The Database Layer manages the storage and retrieval of data. It stores information related to users, bookings, payments, destinations, tours, and admin activities.

D. *Proposed System Prototype*

The design prototype of the Bangka Explorer: Ultimate Travel and Tour Booking System is a dynamic web application developed using PHP for server-side processing, HTML for structure, and CSS for styling. This system allows users to browse available tour packages, register and log in, view detailed information about travel destinations, and book tours online. The passenger-facing interface is clean and user-friendly, enabling smooth interactions such as selecting travel dates, viewing package prices, and submitting booking requests. On the administrative side, a secure login allows tour operator to manage tour listings, update package details, view passenger bookings, and handle cancellations. The backend is powered by a MySQL database that stores user information, tour packages, and booking records. PHP handles all interactions between the frontend and the database, ensuring that data is processed securely and efficiently. This prototype offers a practical and expandable foundation for building a fully-featured online tour booking platform.

D.1. *Passengers Login Page*

Used as the secure entry point to access the proposed system, upon reaching the login page, passengers are prompted to enter their registered username and password into simple and user-friendly form. Once submitted the system verifies these credentials and if the details are correct, the passenger granted access to the system dashboard.

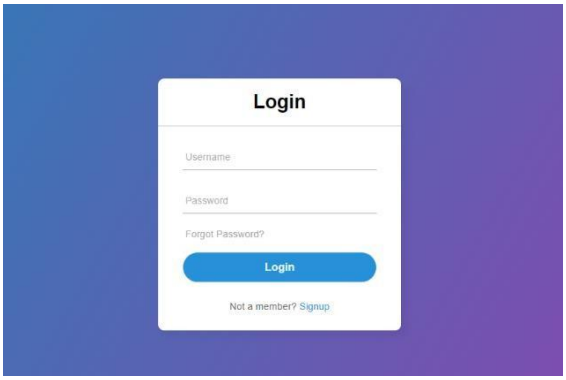


Figure 4. Passengers Login Page of the Proposed System

D.1.2. ***Passengers Main Page***

The passenger main page allowed users to explore the various features of the system. On this page, passengers could access the booking form, view images showcasing travel and tour boats, and enjoy visual representations of some of the most popular tourist destinations. These elements were designed to enhance the user experience by providing both functional and visually engaging content, encouraging users to explore and book their desired travel packages.

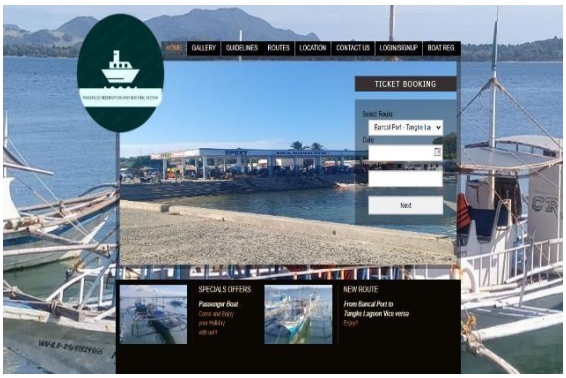


Figure 5. Passengers Main Page of the Proposed System

D.1.3. ***Payment Methods***

There are two payment methods used in the system, GCASH and PAYMAYA where the passengers make a secure and fast payments directly from their mobile phones or devices. These methods cater to the increasing demand for cashless and contactless payment solutions improving the convenience for passengers.

E. ***Data Management***

The system was managed through an intuitive admin dashboard that allowed authorized personnel, such as administrator as tour operator, to add, edit, and manage travel content in real time. This included uploading tour packages, destination details, pricing, itineraries, media (images/videos), accommodation information, transportation schedules, and promotional offers. The system enforced role-based access control (RBAC) to ensure that only verified users could perform certain actions, such as approving or removing listings. Administrator could also manage user accounts, view booking histories, track passenger inquiries, and monitor payment statuses. Data was stored in structured databases with regular backups and version control to prevent loss or unauthorized changes. Additionally, audit logs were maintained to ensure accountability.

MATERIALS AND METHODS

A. ***Respondents***

The study's respondents included four key groups, each offering valuable perspectives on the *Bangka Explorer* system. Eighty-six random local and foreign passengers and 10 boat owners participated, providing feedback on the system's usability, functionality, and effectiveness in providing satisfactory services. As well as, one tour operator as administrator, specifically in validating passenger's and boat owners data and enhancing the booking transactions. Furthermore, three IT professionals, recognized as industry experts with extensive software development and system architecture experience, evaluated the system's design, performance, and scalability, ensuring that it aligns with best practices in software development and can adapt to future innovations such as mapping APIs or SMS integration.

The findings showed that the respondents were satisfied by the performance and services of the developed system.

Table 1. Distribution of the respondents

Type of Responder	N	Percentage
Total Population	**100**	**100%**
engers (Local & Foreign)	86	86%
Boat Owners	10	10%
Tour Operator	1	1%
IT Professionals (experts)	3	3%

A. ***Research Instrument***

For the Expert Evaluation, the study employed the ISO/IEC 25010 Software Quality Model to assess critical attributes such as security, usability, and performance efficiency. A structured questionnaire aligned with the standard was distributed to random local and foreign passengers, boat owners with IT or administrative expertise, making certain that their comments were based on useful system performance and the relevance of service delivery.

For the User Evaluation, the Computer System Usability Questionnaire (CSUQ) was adapted to fit the nature of the *Bangka Explorer* system. It focused on aspects such as ease of user experience through a comprehensive travel and tour booking platform, responsiveness of handling passenger's information, boat owner information, transactions and overall user satisfaction. The CSUQ provided quantifiable data on the system's interface design and its effectiveness in managing booking management.

Table 2. Five-point Likert Scale with the mean range interpretation for the user.

Mean Score	Verbal Interpretation
4.21 – 5.00	Excellent
3.41 – 4.20	Very Good
2.61 – 3.40	Good
1.81 – 2.60	Fair
1.00 – 1.80	Poor

Table 3. Seven-point Likert Scale with the mean range interpretation for the expert

Criterion	Mean	Verbal Interpretation
Security	6.20	Excellent
Usability	6.44	Excellent
Performance Efficiency	6.51	Excellent

Mean Score	Verbal Interpretation
6.1 – 7.0	Excellent
5.1 – 6.0	Good
4.1 – 5.0	Adequate
3.1 – 4.0	Fair
2.1 – 3.0	Poor
1.0 – 2.0	Very Poor

A. Data Gathering and Procedure

The study utilized a combination of interviews and questionnaires to collect comprehensive data. Questionnaires were administered to eighty-six random local and foreign passengers who served as the system's primary users. The evaluation utilized the Computer System Usability Questionnaire (CSUQ) to assess the system's security, usability, performance efficiency, and overall user experience. The survey comprised both closed-ended questions for quantitative analysis and open-ended questions to collect qualitative insights on the system's efficiency and practicality in managing passenger booking information. Meanwhile, structured interviews were conducted with three IT experts, all with backgrounds in system development and user-interface design. These interviews aimed to obtain expert insights on the system's functionality, software quality, and its potential for future scalability and integration, especially in alignment with the ISO/IEC 25010 Software Quality Model. The expert feedback identified areas for improvement and validated whether the system complies with technical and performance standards.

B. Data Analysis

System showed that users found the system easy to use, reliable, and efficient for booking transactions. Quantitative results highlighted strong performance and high user satisfaction, while qualitative feedback suggested improvements like better mobile responsiveness and added features. Expert evaluations confirmed that the system meets technical and performance standards, with recommendations for future scalability enhancements.

For the security evaluation, the Computer System Usability Questionnaire (CSUQ) responses from tour operator, boat owners and passengers were examined using a 5-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). This approach enabled the researchers to systematically measure and analyze several key aspects of the system from the users' perspective, including their overall satisfaction with the platform, how easily they could navigate through the various features and functions, and their perception of how efficiently the system *performed its intended tasks.*

The mean score was calculated for each usability criterion to determine the overall effectiveness and acceptance of the system among end-users.

For the expert evaluation, responses from IT professionals were analyzed based on the ISO/IEC 25010 Software Quality Model, focusing on attributes such as functional suitability, reliability, maintainability, and scalability.

II. RESULTS AND DISCUSSION

The Bangka Explorer: The Ultimate travel and Tour Booking System was evaluated using the CSUQ instrument to gather usability feedback from random local and foreign passengers, boat owners and tour operator.

Table 4. ISO/IEC 25010 software quality ratings for the Bangka Explorer (7-point Likert Scale)

The *Bangka Explorer* obtained an overall mean score of 6.38, interpreted as excellent, This highlights the system's resilience capability in handling booking transactions, including storage, management, and validation. Respondents confirmed that it operated reliably, preserved data accuracy and accountability, and was structured in a way that supports easy maintenance and for future enhancements.

CONCLUSION

The development of Bangka Explorer: Ultimate Travel and Tour Booking System for BANCAL PORT of Carles, Iloilo achieved its main goals by offering a smooth, secure, and user-friendly platform for searching, booking, and managing travel plans. It showed strong performance in processing bookings, maintaining accurate data, and running reliably. The following conclusions were drawn:

1. The online-based system successfully addresses its core objectives by providing a reliable and efficient platform for managing bookings, passengers, and boat information. The system not only optimize data management but also enhances the user experience by showcasing popular tourist destinations and offering timely SMS notifications about booking statuses. With features like filtered reporting on payments and ticket, it supports better tracking and decision- making. Additionally, the integration of multiple online payment options such as PayMaya and GCash adds convenience for users, while faster transaction processing significantly improves booking efficiency. Overall, the system meets its intended goals and provides a strong foundation for future improvements and scalability.

2. Using the ISO/IEC 25010 Software Quality Model and the Computer System Usability Questionnaire (CSUQ), the system was assessed to perform exceptionally well in key software quality areas such as security, usability, and performance efficiency, while also delivering high levels of usability and user satisfaction.. The evaluation results validated that Bangka Explorer effectively provide a consistent reliable booking transactions to its intended users by integration of multiple payments and faster transaction process while meeting international software quality standards.

RECCOMENDATIONS

Based on the evaluation and performance of the proposed system, several improvements can be made to further enhance its functionality, user experience, and flexibility:

1. Local tour and boat owners were encouraged to adopt Bangka Explorer as the primary tool for booking transactions of passengers to enhance accuracy, accessibility, and efficiency in record-keeping within the establishment. Conduct a training session for the ticketing office in BANCAL PORT CARLES, ILOILO to ensure they understand the system's functionality and are well-acquainted with its features.Integrated more payment options by adding other digital payment solutions or bank transfer features can offer more convenience and flexibility for users. Expanding notification options by implementing email and in-app notifications that ensure users receive timely updates regarding their booking reservations. And introduce customer feedback and review system.

2. Structured collection of passengers feedback should be practice to continual improvement of the booking transactions and implement a regular maintenance for the updates and changes to keep the system smoothly operational, accessible, and in line with trends destinations.

REFERENCES

[1]. Buhalis, D., & Law, R. (2008). *Progress in information technology and tourism management: 20 years on and 10 years after the Internet—the state of eTourism research. Tourism Management, 29*(4), 609-623. https://doi.org/10.1016/j.tourman.2008.01.008.

[2]. Smith, J. (2021). A web-based system for boat service management in tourism. *Journal of Tourism and Travel Technology*, 10(3), 45-60. https://doi.org/xxxxxx

[3]. Dela Cruz, M. J., Santos, R. A., & Villanueva, C. P. (2019). *A Study on the User Satisfaction of Online Travel Booking Platforms*. University of the East. *(Unpublished undergraduate thesis)*

[4]. Technological Institute of the Philippines. (2021). *Web-Based Tour Reservation and Management System for Local Travel Agencies*. *(Unpublished capstone project*)

[5.] Ramos, J. M., Dizon, A. L., & Bautista, K. R. (2020). *Development of a mobile-based travel booking application for local tourism*. Polytechnic University of the Philippines. *(Unpublished undergraduate thesis)*

[6]. Doe, J. (**2020).** The software development lifecycle (SDLC): A comprehensive overview. *Tech Articles Journal*. https://www.techarticles.com/sdlc

[7] TechTarget. (n.d.). **Rapid application development (RAD)**.*TechTarget*.https://www.techtarget.com/searchsoftwarequality/definition/rapid-application-development.