Digitalized Booking for Hundred Islands: A Developmental Approach Towards Industrial Advancement of Alaminos City Tourism

Jonel C. Rabanillo, Dexter G. Reyes*, Eugene O. Huya*, Christian Paul Cruz*

Pangasinan State University

***Corresponding author**

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ABSTRACT

Hundred Islands, the drive of Alaminos City towards its economic progress particularly in the Industry of Tourism, is a tourist destination that offers various island experiences and activities therein. Boat booking for a trip to the Islands is managed by the tourism office through a manual process, leading to operational delays and inefficiencies. This study presents a system architecture for an Online Boat Booking System for the Hundred Islands, addressing inefficiencies in the current manual reservation process. Literature Reviews were used to support the development of the Online Boat Booking System and to guide the researchers in developing the system architecture. Moreover, interviews, observations and documents analysis were employed to aid the researchers in understanding the business nature and its process. The study's implications suggest that adopting an online boat booking system will not only provide tourists with a seamless process of booking but will also elevate the tourism industry of the Alaminos City as it brings the Hundred Islands to a wider customer base, being of help in the promotion of Alaminos City tourism. As Alaminos City's industry continues to grow, the creation of a digital platform reaching a broader customer base becomes increasingly vital for ensuring the long-term sustainability of the tourism sector.

Keywords: Alaminos City, Booking System, Hundred Islands, Online Boat Booking, Tourism

INTRODUCTION

The digital transformation of the Philippine Industry has been a game changer, steered the industry towards growth and fostered sustainable practices. LGUs in the Philippines made a significant contribution on growing the tourism industry; a significant initiative being the development of online platforms that provide detailed information on tourist destinations, accommodations, and activities. An online booking platform allows consumers to schedule a hassle-free appointments or reservations through digital means without the need to make a call or an email. It saves consumers time, and for the companies, it saves them lots of activities instrumental in managing bookings and payments, which would instead be cumbersome if done manually. According to research, manual booking process is laborious and prone to errors, resulting in financial losses and customer dissatisfaction. The difference between manual and automated systems is that the former can lead to real-time adjustments and glitch-free monitoring, which increases efficiency and eventually customer satisfaction.5 Further, previous studies have shown that online reservation key in the total bookings made can be quite high.6 this proves that customers find online booking more convenient and hassle-free.

Localized online booking systems in tourism have become essential tools for enhancing customer experience and operational efficiency. According to Buha (2023), online booking systems enable consumers to self-book and pay through websites and platforms that provide business in this vital sector a tool instrumental for managing and scaling up their services effectively (Steeves, 2020). It means digital strategies or avenues available to ensure service is provided without necessarily coming to the physical site to get all the details. Modern booking systems apply digital technologies to optimize booking operations between users and real-time access to information for better decision-making purposes. The digital booking process has gone through a disruptive transformation because users now make service bookings through smartphone-enabled applications. Customer data analytics integration enables businesses to customize their services and forecast market trends, thus they can provide better experiences to customers (Vlahović et al., 2024). Online boat booking systems in tourism have become major

components because they bring improved efficiency and user convenience to both service providers and travelers (Banta et al., 2024). These systems create streamlined processes, which lead to better user experiences and competitive advantages in the tourism industry (Mazlan et al., 2022). Studies indicate that digital transformation in the tourism industry enhances customer satisfaction and streamlines the booking process, ensuring better management and service quality (Herrera, 2022). Through the use of real-time automated monitoring, organizations can make rapid changes that boost their total number of bookings (Farooq, 2023).

Tourist destinations experience significant transformative changes due to online booking systems because these systems transform how visitors book their trips and interact with destinations. Travel systems that operate online contribute to enhanced convenience as well as operational efficiency, and they deliver useful customer data to create better tourist experiences. Online booking platforms unify booking procedures, minimizing travel agency administrative work and avoiding avoidable booking errors (Abu-AlShaeer et al., 2024 / Lohith et al., 2024). All businesses across all sizes can use online appointment scheduling and booking systems to enhance their operations and customer relations throughout the long term (Roxas, 2022).

In conjunction with the progress of the Philippine Tourism industry, this research will aid and be more focused on the development of an Online Boat Booking System, promoting the tourism industry in the city of Alaminos. The Hundred Islands National Park, managed by the office of Tourism, is a tourist destination that offers various island experiences and activities therein: therefore, becoming the drive of the city towards economic progress. However, the manual system is administratively burdensome, resulting in long queues, errors, and inefficiencies that reducing the overall tourist experience.

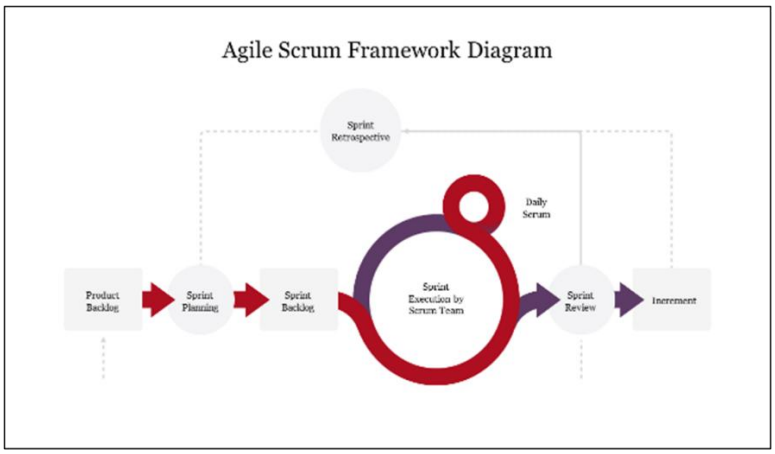
METHODOLOGY

The researchers utilized descriptive developmental approach to conduct the study, ensuring a thorough analysis while systematically developing the framework. Descriptive research will be employed to collect data regarding the research problem, aiming to obtain a clear understanding of the process and challenges in the current booking system. This will serve as the outset of the project as it outlines the problem details that are in need of being addressed. Developmental research, on the other hand, aims to develop the features to be integrated on the proposed solution. This will serve as the inception of the proposed solution which is intended to satisfy the research problem.

This study involves several stages to ensure the efficient development of the Online Boat Booking System for the Alaminos City Hundred Islands. To systematically develop the proposed solution, the Scrum methodology was employed.

Scrum is an agile project management framework ideal for teams working in collaboration for complex products [1]. It consists of meetings, roles, and tools to help teams manage their workload. In spite of often being used by software development teams, scrum is beneficial to any team collaborating to achieve a common goal. The Scrum follows 7 phases, as shown below: Product Backlog, Sprint Planning, Sprint Backlog, Sprint Execution, Sprint Review, Sprint Retrospective, and Increment. Figure 1 shows the Agile Scrum Framework Diagram.

Figure I. Agile Scrum Framework Diagram.



The first phase requires collaboration between the product owner and development team to gather and understand the project requirements. This phase is called the Product Backlog. It involves collaboration between the product owner and development team to grasp the project's requirements thoroughly. Scenarios illustrating the user's anticipated interactions with the boat booking system were developed, including the intended outcome for each scenario were set. Additionally, the researchers gathered essential insights for the system's function. These were obtained through discussions, inquires, and observations. Tasks were then organized based on their importance and complexities, resulting in a structured task list.

After gathering the project requirements, the team discussed and clarified the selected backlog items for the boat booking system, breaking them into manageable tasks and estimating required effort. After which, a detailed plan encompassing task assignments, timelines, and dependencies was created. Through this, a synchronized effort towards achieving the Sprint Goal within the project's timeframe is ensured. Special attention is given to managing task dependencies to optimize workflow and minimize project risks, ensuring plausible sprint's successful execution.

Sprint Backlog were used as a reference for daily tasks. These were updated as the project progress through the sprint, either adding new tasks and removing completed ones, or adjusting priorities if necessary. The Sprint Backlog has helped the team to stay focused and aligned with the Sprint Goal.

From the tasks defined from the Sprint Backlog, the researchers began in designing the system architecture. This phase is called Sprint Execution. It encompasses several imperative activities, starting with the design phase where detailed architectural and user interface designs are created based on project requirements. Developmental tools such as Adobe Photoshop, Draw.io, and Figma will be used to craft the initial system output, while tools like Entity Relationship Diagrams, Use Case Diagrams, Use Case Descriptions, and Flowcharts are employed to describe and illustrate the system's internal processes. The team will then transition into translating the initial design into actual software where they write code, build functionalities, and integrate components using a range of technologies and frameworks like HTML, CSS, JavaScript, Laravel, Alpine.js, Tailwind, PHP, and MySQL. This phase also includes rigorous testing to ensure the system meets quality standards and functions as defined from the previous phases. Throughout Sprint Execution, regular updates, progress tracking, and addressing impediments or changes are managed, with daily Scrum meetings held to synchronize work, discuss progress, and adapt plans as needed.

After the laborious development of the project, the researchers will then proceed to the next phase, which is called the Sprint Review. This phase highlights developed functionalities and gathers feedback from stakeholders through Black box testing and surveys. The team will invite IT experts and tourism personnel to test the system to ensure that the requirements are met on both technical and functional aspects. Feedback from stakeholders, including the Product Owner and users, will be used as the lead to identify issues and areas for improvement. The Sprint Review informs updates to the Product Backlog.

During the Sprint Retrospective, team members engage into an open discussion about the discrepancies encountered during the recent sprint execution. It focuses on what worked well, and areas subject to improvement related to processes, teamwork, tools, communication, and other project-relevant aspects. They will then identify the actionable items to enhance performance in the upcoming sprint, striving for continuous improvement and increased efficiency and effectiveness.

The last sprint, which is the Increment, will serve as the sum of all the completed and tested product backlog during the sprint. During this phase, the team members will ensure that the features developed during the sprint are integrated, tested, and that they meet the requirements intended from the start. During this phase, the system is expected to perform its intended functions as all the features are integrated into it. Additionally, proponents prepare an implementation plan for the project's launch, providing training and information distribution to stakeholders. Adapted survey questionnaires are used to gauge system acceptability, gather feedback from users, and identify areas for improvement. This data-driven approach enhanced system usability and user experience, guiding informed decision-making and updates to the Product Backlog based on feedback from the Sprint Review.

The collection of data for this project comes from a combination of primary and secondary sources. The primary sources of information are obtained from direct engagement with the Tourism Office and the boat booking process therein. This includes the structured and unstructured interview, thorough observation of the manual booking process, and scrupulous documentation of relevant information for the development of the project. The secondary sources of information, on the other hand, helps complement primary sources by providing useful information such as industry standards. These sources include research papers, industry reports, and trusted websites that back up the project's goals.

The respondents for this project comprise thirty (30) tourists, two (2) IT experts, and three (3) Key Tourism Personnel, with the total of thirty-five (35) respondents. The were randomly selected from the population of visiting tourists to the Hundred Islands without restrictions of certain criteria. This approach ensures that the responses reflect a diverse range of visitors, providing insights applicable to the broader tourist population. The Key Tourism Personnel includes the Tourism Head, Tourism Watchman III, and the Counter Personnel. The respondents that will assess the acceptability of the system were as shown in table 1.

Table 1. Respondents of the study.

Respondents	**Number of Respondents**
Tourism Personnel	3
IT Experts	2
Tourists	30
Total	**35**

To determine the acceptability of the proposed system, the researchers utilized the Scale of Measurement. An ordinal scale was used to classify and interpret data by ranking different acceptability levels based on numerical values. The scale assigns numbers from 1 to 4 where the higher the number indicates higher level of acceptability. Statistical ranges were used to define the boundaries for each category to ensure that the acceptability falls within specific limit. The indication of statistical limits, together with their level of acceptability and interpretation are as shown in the table 2 below.

Table 2. Scale of Measurement

Scale	Statistical Limits	Level of Acceptability	Descriptive Interpretation
4	3.26 – 4.0	Excellent	The condition is highly comprehensive and operating efficiently.
3	2.51 – 3.25	Very Good	The condition is satisfactory and functioning as expected.
2	2.76 – 2.50	Good	The condition falls short of meeting the necessary requirements.
1	1.00 – 1.75	Poor	The condition falls short of meeting the necessary requirements.

RESULTS AND DISCUSSIONS

The development of an Online Boat Booking System for the Hundred Islands in Alaminos City aims to leverage digital transformation to enhance the tourism industry by automating reservations, improving operational efficiency, reducing administrative burdens, and providing a better user experience for tourists and staff. The

following are proposed system framework and architecture of the Hundred Islands.

Proposed System Architecture

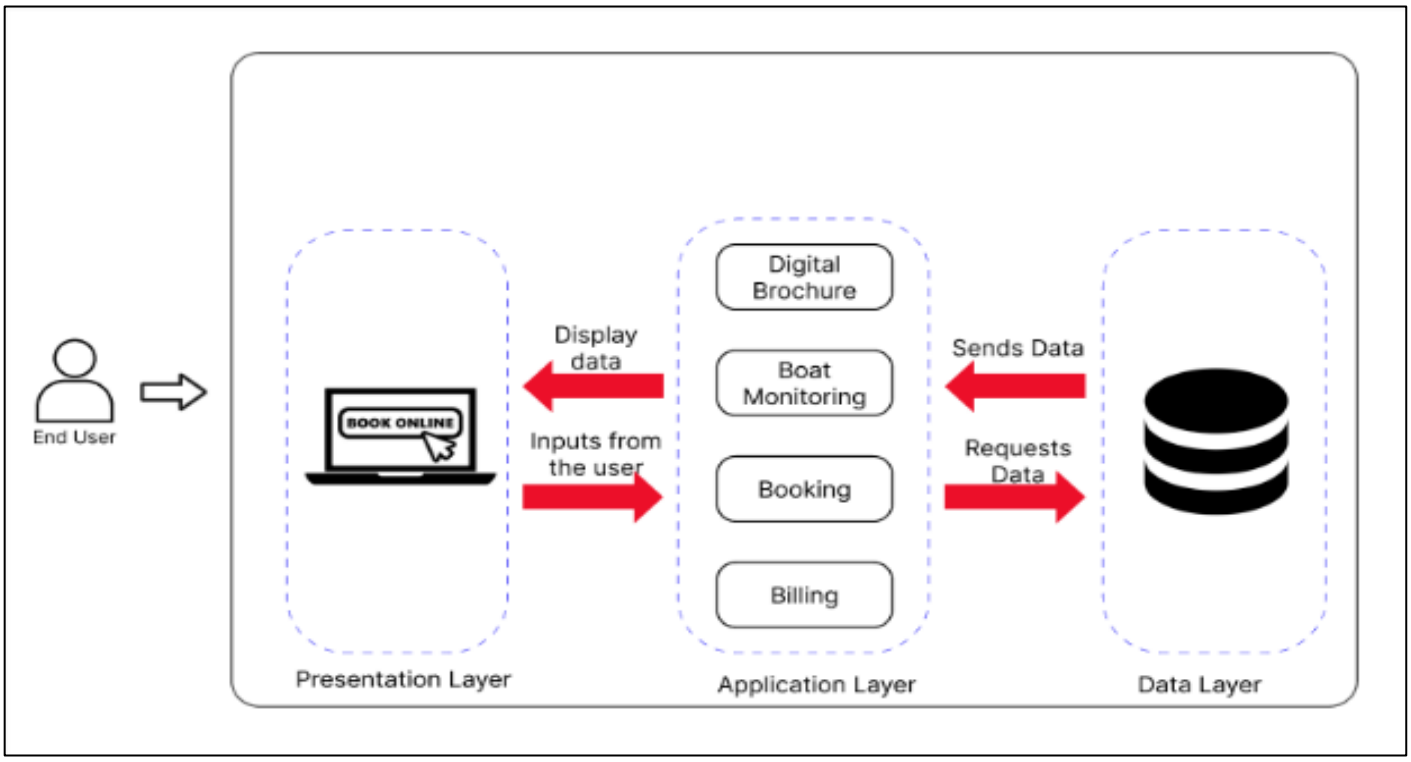


Figure 2. Online Boat Booking System Three Tier Architecture

The Online Booking System Three Tier Architecture is divided into three logical layers, which are the presentation layer, application layer, and the data layer.

The Presentation Tier is the user interface (UI) layer where the system and the user interact. It is responsible for displaying information and sending contents to browsers in the form of HTML, CSS, and Javascript. This tier ensures ideal user experience by rendering visuals, processing inputs, and formatting data received from the application layer.

The Application Tier is the heart of application as it contains the services the system provides the users. It processes the data collected from the presentation tier using business logic, in accordance with the business rules. Users start by accessing the web app interface, which then directs them to a Digital Brochure containing information about island activities, rental rates, and other relevant details for the Hundred Islands experience. The Boat Availability feature assists the Tourism Watchman in monitoring each boat's departure, aiding in managing the boat queue effectively. Following the digital brochure review, tourists proceed to the Booking service, where they select a boat based on their preferences and provide personal details for reservation processing by the management. The Billing service offers tourists a comprehensive breakdown of their expenses, covering boat reservations, insurance, environmental fees, and other relevant costs, ensuring transparency and accuracy in financial transactions.

The Data Tier, also known as database tier, is the foundation of the three-tier architecture, is where the information collected from the application tier is stored and managed. This tier is responsible for storing, retrieving, and managing data with security and integrity.

Problems and Proposed Solutions

In order to figure the problem of the manual process on boat bookings system, the researchers conducted interviews, allowing them to further understand the current process, spot inefficiencies, and pinpoint areas of improvement to provide a better and more effective booking system.

Hundred Islands serves as the key economic driver in the tourism industry of Alaminos City, Pangasinan.

However, tourists must first make a booking at the Tourism Office situated at the Luca Wharf Alaminos City in order for them to visit the Islands. The Tourism office currently relies on manual booking system that makes use of pen and paper to record and manage relevant booking information. This results in cascading discrepancies, leading to inefficiency, customer inconvenience, data management issues, and human errors.

The manual boat booking process causes slow processing time, long queues and limited customer capacity, making operations mostly unproductive. Tourists need to go through multiple on-the-spot processes such as filling out the passenger's manifest, fees briefing, registration and boat selection. After that, the tourist will then proceed to the wharf to wait for the boat assigned to their booking. This not only delays the booking process but also causes dissatisfaction to customers as every accommodated customer must be verified one by one. To address this, the development of online boat booking system will be vital, allowing faster transactions and reduce wait times. With an online platform, customers will be able to fill out the needed details beforehand, eliminating the need for excessive paperwork. This will improve inefficiency, allowing both the tourists and tourism office for a smooth transaction.

The absence of online boat booking system requires the tourists to visit the tourism office in person during office hours to secure a booking. This laborious process makes it almost impossible for travelers to plan their trips in advance. It also increases congestion at the office, further adding delay to booking. Hence, 24/7 online booking system will solve this issue by providing the tourists with the ability to book their trips anytime, anywhere.

The tourism office relies on outda"ed m'nual records, making information retrieval laborious and prone to errors. The staff must print out three copies of information of a single booking, which would then be given to the tourist, to the association, and to the tourism office for storage purposes. Moreover, the tourism office also uses paper records in monitoring and keeping track of boat records that has already sailed, having the staff to sift through physical files to locate booking details. Implementing a centralized database will improve data accuracy, which enables the tourism staff to access accurate and real time booking details. By having to type in booking to track its record instead of unfolding a lot of papers, automated record-keeping will provide the tourism office to manage, retrieve, and analyze data more efficiently.

CONCLUSIONS

Along with the rapid advancement of the tourism industry, continuous innovation in service delivery is more than important to be in touch with a broader target market and to ensure business sustainability. The design and development of the Online Boat Booking System framework for the Hundred Islands in Alaminos City that addressing critical challenges faced by both the tourists and service providers illustrates such innovation. By replacing manual bookings with the online boat booking system, we not only simplify operational workflows but also increases customer satisfaction. This online boat booking platform promotes the Hundred Islands and the experiences therein to a wider customer base, thereby contributing to the long-term sustainability of the local tourism industry in the long run. Beyond just automating bookings, this system enhances the overall tourism experience in Alaminos City, making the Hundred Islands more welcoming to visitors. As technology continues to evolve, future improvements could explore AI and blockchain for added security, efficiency, and personalization, ensuring that tourism in the region keeps pace with digital innovation.

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