



INCOURT: a Web-Based Court Reservation and  
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Framework

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May 10, 2023

# **INCOURT: A Web-Based Court Reservation and Scheduling Application for Barangay Kalaklan, Olongapo City using Progressive Web Framework**

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## **ABSTRACT**

People currently live in a totally different world than they did years ago, thanks to technological advancements. Technology is one of the most essential ways we have an impact on the planet. The development of web-based applications has progressed to the point where almost all organizations now operate in a paperless environment. Many organizations and agencies have transitioned from manual to computerized systems. Technology has become a big impact of advancement in today's world. It helps modern world to become more efficient and raise productivity, inclusivity of services and improve overall well-being. "INCOURT" wants to make it easier to reserve the court in Kalaklan for the players who want to make a reservation without having to leave their home. And, for the barangay administrator, they will no longer do manual checking of reservations and there will be no conflict with the schedule of those who reserved the court. InCourt is an online court reservation web application in barangay Kalaklan. This enables barangay administrators to monitor and to view the reservation information, as well as properly manage those who made reservations. Also, for the players or event's organizers who want to book the court without having to go to the barangay. This website will help both the Kalaklan personnel and players to reserve and monitor their own schedule. This website application will be beneficial to both players and those looking to reserve or learn more about a court in Kalaklan. This innovative system will assist the barangay of Kalaklan in reserving its basketball court.

### **Keywords**

Court, reservation, application, players, barangay.

## **I. INTRODUCTION**

People nowadays live in a technological world and are aware of how to use technology to their advantage because it makes our daily lives easier, faster, and more comfortable. Many organizations and businesses rely on technology to help them. One of these is the online reservation system, which is used in hotels, resorts, restaurants, and other facilities that can benefit from a reservation system that assists their customers and simplifies management. The online booking system not only helps the facilities unit achieve higher quality, but it also simplifies the booking process and increases management efficiency. The evolution of technology helps people to become more creative and it improves our quality of life.

According to my beneficiary, the barangay Kalaklan. Managing reservations is traditionally time-consuming or labor-intensive because they must carefully examine those who have reserved the court to ensure that there are no conflicts with the schedules. Of course, their potential users, such as the players in barangay Kalaklan have a problem with their desired available date for those who want to reserve the court, or it is sometimes difficult for them to go to Barangay Kalaklan to book or cancel their reservation. This project is a web-based application that provides an online booking platform for Barangay Kalaklan. The application enables the said barangay management to provide their users or potential users with an automated and online platform where they can explore their available rental facilities. Potential users can book the desired facility or facilities if they are available on the desired date. This application's user interface is simple and appealing. This project includes user-friendly features and functionalities.

## II. REVIEW OF RELATED LITERATURE

This section reviews related studies, both local and foreign, in line with the study of programming and utilizing games as a learning intervention.

### **Boracay Grand Vista Resort and Spa**

The Agoda website, where the facility can be seen, has an online reservation system for the Boracay Grand Vista Resort and Spa. It entails scheduling oversight, facility and room reservations, guest information, and confirmation from the guests that they are certain to book some rooms. If a customer wants to visit the resort or make a reservation, they do not need to create an account. Reserving resort amenities and rooms is one of the proposed system's similarities. In contrast to the proposed system, the customer must create an account in order to make or cancel reservations. Making an account will assist the business in ensuring the security of the customer's personal data and the company. This online website platform will be able to monitor the reservations and the regular customers for their business.

### **Marksman Drysdale Travel INC.**

One of the best travel and tour operators in the Philippines is MDTI. Due to the Philippines' underdeveloped tourism industry, MDTI was founded in 1975. MDTI has a head office in the Makati Business District and has operations all over the nation. Customers will be able to use the system to search for the company's services that can be booked online. In terms of reducing data redundancy, inconsistent data in reservations, and paperwork, the MDTI reservation system is comparable to the proponents' proposed system. Due to the speed at which they can now complete their work, computers and the internet play major roles in their daily lives. By making their reservations online, clients could also save time and effort.

### **PH Bus**

By providing a website where customers can purchase tickets for buses, ferries, and airplanes, PH Bus makes traveling convenient. Agoda, Booking.com, and KLOOK collaborate with PH Bus to provide lodging, entertainment, and excursions. PH Bus allows you to make reservations for anything, including hotels, experiences, and travel tickets. A hassle-free trip can be had by quickly booking your travel arrangements. This website offers a variety of services, such as provincial bus tickets, ferry tickets, plane tickets, bus and ferry terminal guides, car, van, and bus rental service,

lodging and hotel reservations, activities, tours, and experiences, and bus advertisements.

### **Facility Reservation**

Eldriebells (2015), who wrote an essay about an online reservation system for a bankal sports complex. The beneficiary recognizes that having such a website will benefit their business. Sports Facilities Reservation System is a comprehensive reservation system for a wide range of activities. It is an automated method of securing accommodation for its clients in order to avoid scheduling conflicts when using selected facilities. Belvedere Sports Complex does not have its own website. Merville's court reservations are on a first-come, first-served basis. Reservations are made for the client's schedule using a manual listing. The Belvedere Sports Complex needs a system that solves their primary problems, advertises the complex, and an automated operation that records data, summarizes it, updates the database, and advertises their complex. The business should run more quickly and easily. The mistakes would be minor. With this automated operation, they can entertain more customers without being bothered. The website includes information about the sports complex's history, stadium, equipment, schedule, time, and date. All of the equipment will be available at the sports complex and on the website. This research, titled "Online Reservation for Belvedere Sports Complex," is significant because Belvedere Sports Complex requires a website to help them gain more customers.

### **Scheduling System**

According to the article, "One obvious benefit you gain by using an online scheduling system is time. It is difficult to manage time especially if you are an independent consultant. You need to maintain everything starting from creating business plans, doing market research, discussing, and delivering solutions to business problems, meeting clients and managing payment." According to this claim, using an online scheduling system will unquestionably assist staff in managing their time as well as in keeping up with things that are vital to the operation of the company. The system will be made available online by the proponent so that both the beneficiaries and the administrator will find it simple to schedule appointments and accept or reject users requests. Since it is online, this will increase the system's flexibility.

### **Online Reservation in Industry**

David Wardell (2012) discussed the current state of hotel reservations in the world. The lodging industry, according to the article, is the least automated

segment of the international travel industry. Reservations are still frequently handled by hand. This lack of automation is a significant source of competition for hotel chains and the hotel industry as a whole. Furthermore, a successful reservation system necessitates a database inventory system that, when processed, sends a message to the property in question indicating that the local guest information database should be updated. David Wardell's research assisted proponents in understanding the current trend in online reservations systems. The system also includes a well-organized and secure database, allowing guests to easily book reservations. The guests will also be aware of the details ahead of time because the system includes a real-time reservation check that informs them of the availability of various types of rooms, amenities, and facilities. This will save not only the guests' time and effort, but also the companies.

### III. CONCEPTUAL AND THEORETICAL FRAMEWORKS

The technical background of the study, including the software program used during its development, is covered in this section.

#### A. Web App Development

Web apps' foundation is based on widely used Internet technologies like HTML and JavaScript. Web apps don't require installation or additional updates. Today, a number of libraries, including JQuery Mobile, Sencha Touch, JQTouch, WebApp.net, Xui, and others. Applications that enable users to carry out actions online are known as web applications (web apps), which are application programs that are stored on a remote server and delivered over the internet through a browser interface.

#### B. Progressive Web App Development

A website that functions and appears like a mobile app is known as a progressive web app (PWA). PWAs are created so that users can take advantage of native mobile device features without having to go to an app store, buy anything, or download anything locally.

#### Front-End Technologies

The front-end layer makes it possible to interact with the internet and carry out desired tasks, like watching videos and doing online shopping, among others. Three essential front-end programming languages are used to develop the look, feel, and design of the

web: JavaScript, CSS, and HyperText Markup Language (HTML).

#### Back-end Technologies

Anything used server-side to create reliable and effective web architectures is referred to as a backend technology. The building blocks of the back-end of a web application are known as back-end technologies, and they include programming languages, databases, communication channels, or frameworks. To retrieve data from a database, a backend developer writes code that performs relational mapping. Some of the most popular DBMS include MySQL, SQL SERVER and PostgreSQL, MongoDB, and Oracle Database. It's essential to have a thorough understanding of how they operate.

#### Progressive Web Application

A web application that can be accessed on any device—desktops, laptops, smartphones, tablets, etc.—in a web browser. A PWA aims to provide a native app experience when it is opened on a mobile device.

#### Application Programming Interface (API)

A software that enables communication between two applications. Data extraction and sharing within and between organizations are made easy with the help of APIs. Two software programs can communicate with each other using an application programming interface (API). An API specifies how a developer should ask an operating system (OS) or other application for services, and how to expose data in various contexts and via various channels.

#### C. Cross-Platform Development

The practice of creating software applications or services that work across various operating systems or software environments is known as cross-platform development. To support various operating systems or environments for one application or product, engineers and developers employ a variety of techniques.

#### D. ISO/IEC: 25010 Software Quality Metrics

Which quality traits will be considered when assessing a software product's properties is determined by the quality model. A software quality standard is ISO 25010, "Systems and software engineering - Systems and software Quality Requirements and Evaluation (SQuaRE) - System and software quality models." It provides practical advice on how to use the quality models and describes the models, which include characteristics and sub-characteristics for both software product quality and software quality in use.

### E. Paradigm of the Study

The goal, driving force, and anticipated results of the research are all explicitly stated in a paradigm, which examines how knowledge is understood and researched. Researchers have a clear path to explore the subject of interest when research paradigms are applied correctly. is the procedure of developing a research strategy that can help you quickly comprehend how the theories and methods of your research project function.

## IV. METHODOLOGY

### Research Design

A quantitative methods study was chosen as the design for this research to enable an in-depth exploration of the court reservation in barangay Kalaklan. A research study was conducted using quantitative analysis that is necessary for the growth of an organization. The survey focused on the reservation of the court for players at barangay Kalaklan.

The descriptive research design will be applied in this study. This research design explains and describes "what is or what was." It is concerned with existing situations or relationships, prevalent behaviors, practices, beliefs, processes, as well as effects that are being felt or emerging trends. In this study, the descriptive research approach is needed since it will describe the respondents' behavior when using social media and the impact or influence it has on them throughout the pandemic.

### A. Respondents/Locale of the Study

The people who use a court are the athletes or event planners who want to reserve one in the barangay. Google Forms and in-person interviews were used in the research, where participants were asked about their attitudes toward and ideas for resolving the problem of encounter reservations with the court in Kalaklans.

### B. Data Flow Diagram

A data flow diagram (DFD) is a graphic representation of how information moves through a process or system.

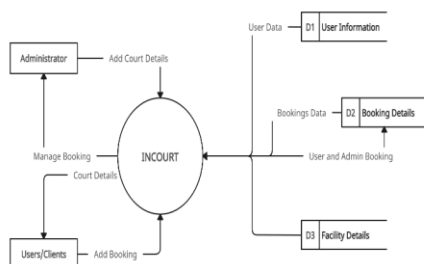


Figure 1. The Data Flow Diagram of the study.

All user information, booking details, and facility details/information will be saved in a database that can be manipulated by the administrator. The administrator has the ability to add facility information that potential users can see and book. The ability to register for an account, reserve a facility, or cancel a reservation is available to potential users.

### C. Requirement Specification

A conceptual model in research explains the concept or idea being addressed in the research.

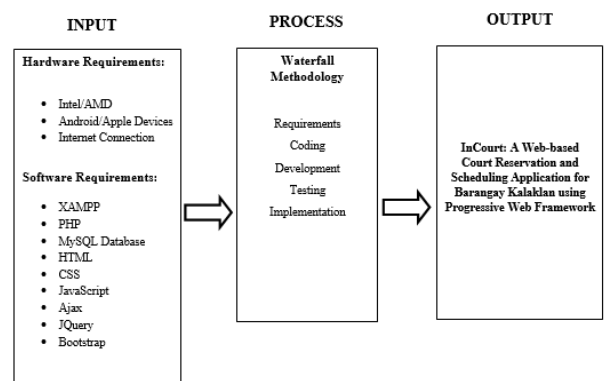


Figure 2. The Conceptual Model of the Study

### D. Data and Process Modeling

A systems analyst develops graphical models in this section, which is the process of giving an entire information system a visual representation.

#### a. Functional Decomposition Diagram

A process for creating large-scale software that has a precise structure for its parts or modules. a diagram that illustrates the dissection of complex systems into their fundamental parts.

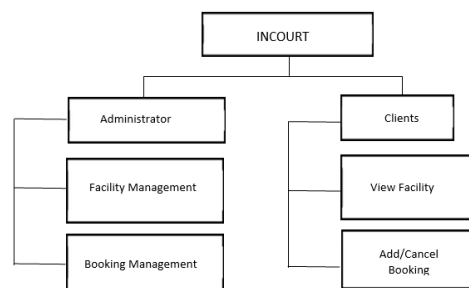


Figure 3. The Functional Decomposition Diagram of the study.

## Use Case Diagram

A use case diagram is a visual representation of potential user interactions with a system. Here, the interactions between the administrator and the user's client are displayed. What they are permitted to do or access and what they are not.

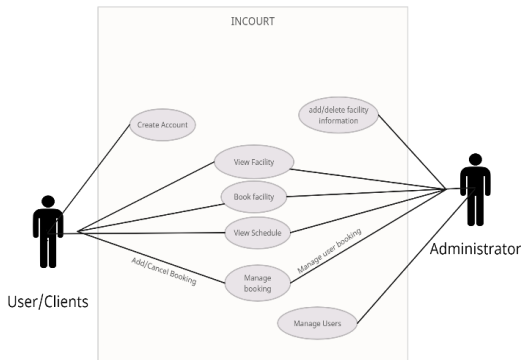


Figure 4. The Use Case Diagram of the study

## E. The instrument used in study (ISO:IEC 25010)

The ISO 25010 Software Evaluation Instrument was the tool used to collect data for this study. Figure 19 depicts the seven key characteristics of the ISO 25010 software quality model: functionality, reliability, usability, efficiency, maintainability, portability, and security. The questions are also changed in accordance with the procedures the system requires.

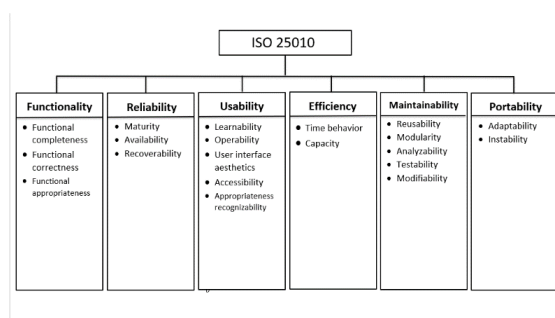


Figure 5. The ISO:IEC 25010 Model

## F. Waterfall Development Methodology

The waterfall methodology has been proposed as the methodology for this project. A waterfall methodology divides a project into distinct phases, each with its own set of deliverables. The phases are defined as definition/requirements, design, coding, testing, and implementation. The waterfall model is depicted in the figure below.

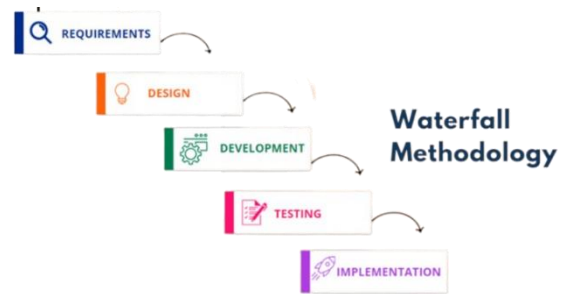


Figure 6. Waterfall System Methodology of the System.

## G. Design

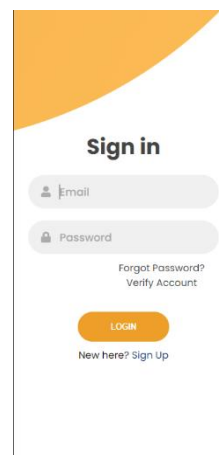


Figure 7. InCourt User Panel Login Screen.

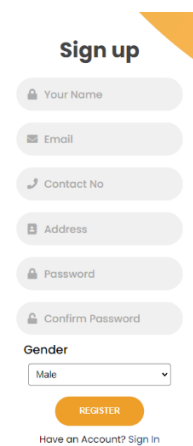


Figure 8. InCourt User Panel Register Screen.



Figure 9. InCourt User Panel Home Screen.



Figure 10. InCourt User Panel List Facilities Screen.



Figure 11. InCourt User Panel About Screen.

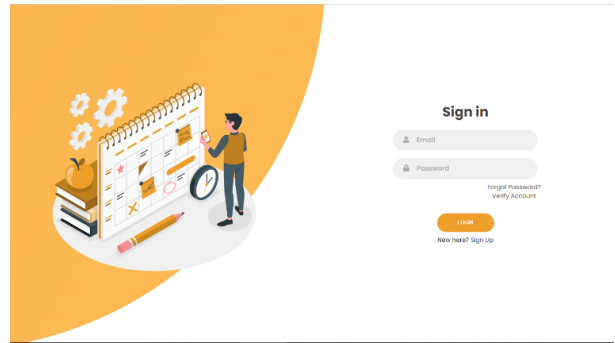


Figure 12. InCourt User Panel Login Screen. (Web)

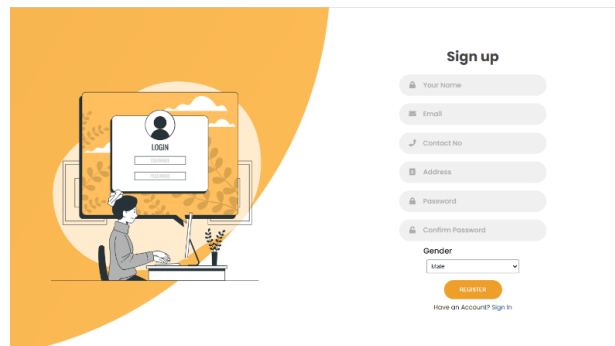


Figure 13. InCourt User Panel Register Screen. (Web)

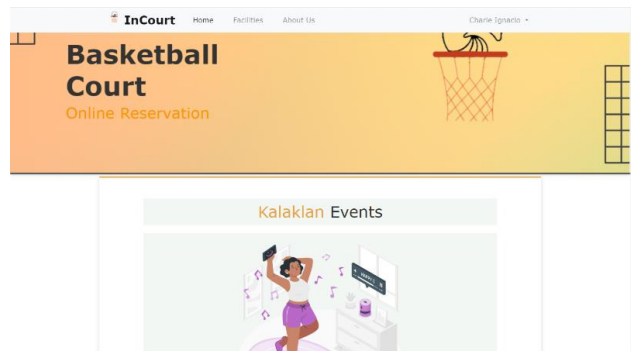


Figure 14. InCourt User Panel Home Screen. (Web)

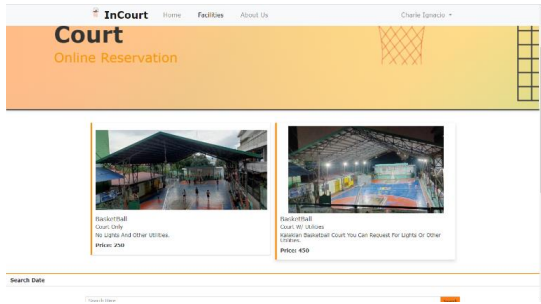


Figure 15. InCourt User Panel Facilities Screen. (Web)

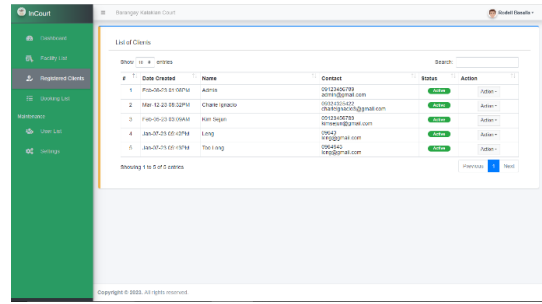


Figure 19. InCourt Admin Panel Registered Client Screen.

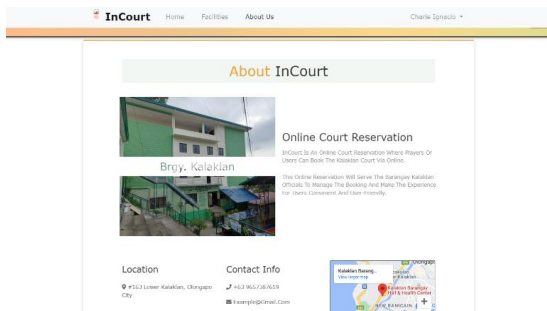


Figure 16. InCourt User Panel About Screen (Web)

## V. CONCLUSION

INCOURT was created to provide a simpler, quicker, and easier platform for clients who want to reserve the facility for basketball court in Brgy. Kalaklan. By allowing users to inquire about court availability and make reservations without having to travel, InCourt saves them time and effort. The following InCourt goals have all been met based on the findings of the study:

1. It is hassle-free because there is no need to visit the barangay to inquire about the court's availability and cost.
2. Give users access to accurate images of the court and barangay information.
3. Provides a platform that allows users or players to reserve the court whenever they want.

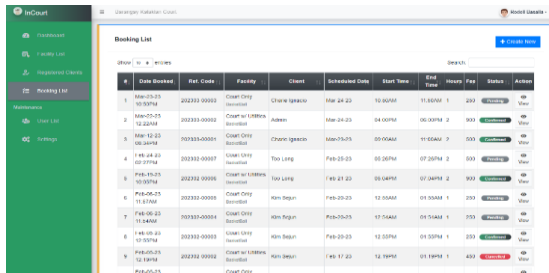


Figure 17. InCourt Admin Panel Booking List Screen

## VI. REFERENCES

[1] *Boracay Grand Vista Resort and Spa.* (2005). Agoda.com. Retrieved April 6, 2023, from <https://www.agoda.com/boracay-grand-vista-resort-spa/hotel/boracay-island-ph.html?cid=1844104>

[2] *phbus.* (2023, March 16). PHTravel Philippines. PHBus Tickets Ferry Online Booking. Retrieved April 6, 2023, from <https://www.phbus.com/>

[3] *Marksman Drysdale Travel: Corporate Travel and Tours | Travel Agency Manila.* (n.d). Marksman-Drysdale Travel Inc. | Travel and Tours | Corporate Travel Agency. Retrieved April 6, 2023, from <https://marsmantravel.com.ph/>

[4] Asenova, I. (2018, April 2). *The benefits of Online Booking Systems.* Clock Software. Retrieved April 6, 2023, from <https://www.clock-software.com/blog/Benefits-of-online-booking-systems.html>

[5] Bitner, M. J., Brown, S. J., & Meuter, . L. (2000).

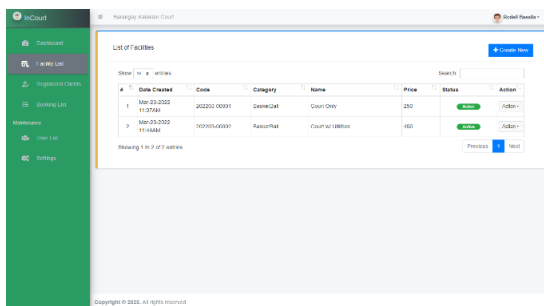


Figure 18. InCourt Admin Panel Facility List Screen



Technology Infusion in Service Encounters. *Journal of the Academy of Marketing Science*, 28(1), 138-149. Retrieved April 6, 2023, from <https://doi.org/10.1177/0092070300281013>

[6] Edriebells (2015, August). *Online Reservation System for Bankal Sports Complex*. (n.d). ReviewEssays.com. Retrieved April 6, 2023, from <https://www.reviewessays.com/essay/Online-Reservation-System-for-Bankal-Sports-Complex/73405.html>

[7] Wardell, D. (2014, June 3). *Hotel Technology and Reservation Systems*. Academia.edu. Retrieved April 6, 2023, from [https://www.academia.edu/427904/Hotel\\_Technology\\_and\\_Reservation\\_System](https://www.academia.edu/427904/Hotel_Technology_and_Reservation_System)

[8] Dijk, G.V., Minocha, S., and Laing, A. Interacting with Computers 19 (2007) 7–19. doi:10.1016