

LUNA BAY APP: A RESORT MANAGEMENT SYSTEM FOR SCHEDULING, POS, AND FINANCIAL TRACKING

**Presented to the Faculty of
Information and Communications Technology Program
STI College Ortigas-Cainta**

**In Partial Fulfilment
of the Requirements for the Degree
Bachelor of Science in Information Technology**

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December 2024

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INTRODUCTION

In order to manage a resort, it must be able to operate different activities, such as booking reservations, scheduling, billing, and managing the resort's maintenance. In the past, these activities were done manually and heavily relied on manpower, which can be a problem due to inefficiencies, inconsistencies, errors, and challenges in tracking important operational data.

Luna Bay Resort, a resort offering various amenities like food services, swimming areas, cottages, and equipment rentals, currently lacks a more advanced integrated management system. The lack of modern technology at Luna Bay Resort raises several challenges, making it more difficult to maintain productivity and effectively manage activities and services. The resort has trouble managing reservations, schedules, and billing without a well-organized system, which might result in errors and inconsistencies. This can negatively impact the resort's overall performance and make it more difficult to give customers a smooth experience, which could lead to lower customer satisfaction and revenue loss.

In this study, the developers suggest developing the Luna Bay Resort App, a resort management system that integrates essential functions into a single system, to tackle these challenges. Financial tracking, booking management, scheduling, and a point-of-sale (POS) system for food services, rentals, and swimming equipment are some of the features that will be included in the app. The app will increase time management, reduce the risk of errors, and improve Luna Bay Resort's operational efficiency and customer satisfaction by combining multiple tasks and features into a single interface.

Through this proposed application, daily tasks can be automated to free up staff time for higher-value activities like facility maintenance and customer assistance, which will improve the overall guest experience. By incorporating all of these tasks and functions into a single system, the app seeks to reduce errors, increase time management, and improve Luna Bay Resort's operational effectiveness and customer experience. This all-in-one system will give resort workers and employees the resources they need to handle inventory, track financial transactions, and manage scheduling.

Background of the Problem

In the resort industry, adapting to new technological advancements can be challenging for some resorts. According to Behrisch (2023), staying current with technology is critical in the hospitality industry. In an era of rapid digital transformation, hotels and resorts that delay modernizing their technology risk falling behind competitors and impacting the guest experience. Outdated systems can significantly hinder service quality, and in an industry where customer satisfaction is paramount, keeping up with technological developments is essential. Behrisch also noted that investing in modern technology directly contributes to customer satisfaction and enhances profitability over time. In today's competitive hospitality landscape, embracing technology is key to staying relevant and delivering exceptional guest experiences.

Investing in advanced technology plays an important role in the hospitality industry. However, not all business owners, such as small to medium-sized resorts, are willing to invest in a modern integrated system due to various factors, such as financial limitations.

Currently, Luna Bay Resort, a medium-sized resort, operates without an advanced integrated management system, relying on separate processes for scheduling, financial tracking, and point-of-sale transactions. This outdated approach often results in inefficiencies, making it difficult for managers to track resources, monitor staff schedules, and manage finances effectively. Implementing an all-in-one management application could help the resort streamline operations by automating transactions, reducing redundancy, and providing easy access to essential information for daily operations.

This study proposes the development of an integrated application designed to address these issues, particularly for small to medium-sized resorts. A unified system for resort managers would offer a straightforward way to manage financial reporting, equipment rentals, point-of-sale transactions for food and recreational facilities, and scheduling. The proposed software aims to provide faster and more accurate services, ultimately enhancing the resort's efficiency and improving overall customer satisfaction.

Overview of the Current State of Technology

In managing a resort, having a more advanced technology and modern way of performing transaction as they provide a more organized and smoother experience in which customers would prefer. In today's generation, hotels and resorts has been continuously adapting and transitioning from manual transactions into a much more digitalized and modern operation to stay relevant in a fast growing technology and to compete to its competitors.

However, due to limited resource, many small to medium-sized resorts face challenges in fully integrating advanced technology. As a result, resorts like Luna Bay Resort rely on separate systems for scheduling, financial tracking, and point-of-sale (POS) transactions, which increases the risk of errors, and complicates record-keeping for smooth daily operations.

In today's current technology, most businesses like resort uses advanced technology such as Property Management Systems (PMS). According to Adaramola (2021), PMS is a flexible system that is widely used in many different businesses, particularly in the hospitality industry. A PMS is a centralized online platform that simplifies everyday tasks like scheduling, organizing, and managing accounts and bookings. Therefore, it is a great option for companies seeking to improve productivity and automate processes. A PMS is crucial for professional management of properties since it enables companies to optimize functionality by centralizing these tasks.

However, these advanced technologies can be expensive and difficult to implement, especially for smaller resorts that may lack the necessary funding or technical infrastructure. This leads to difficulties and limited data accessibility as smaller businesses often resort to manual tracking or separate, standalone software.

To address these challenges, the proposed Luna Bay Resort App, similar to a Property Management System (PMS), is designed to offer a comprehensive management system created particularly to satisfy the specific needs for small to mid-sized resorts like Luna Bay Resort. Financial tracking, scheduling, POS for food services and swimming equipment, and booking management will all be integrated into a single

platform through this application. By centralizing and automating these processes, the system keeps operating costs low while enabling resort employees to work more effectively, make errors less frequently, increase productivity, and concentrate on improving the overall experience for guests.

Objectives of the study

General Objective:

To develop an integrated management system, the Luna Bay Resort App, designed for small to medium-sized resorts that will increase business' productivity and guest satisfaction while streamlining operations and reducing errors.

Specific Objectives:

1. To Develop an Intuitive Interface for streamlined resort operations cost-effectively

By creating and putting into use a straightforward system that streamlines necessary functions like booking, scheduling, and financial tracking, increasing productivity for managers and staff while lowering labor costs.

2. To Enhance Customer Satisfaction and Competitive Advantage Through an Integrated System

By implementing an integrated system to manage resort transactions and operations, the resort will ensure accurate records and a seamless guest experience. Automating booking, scheduling, and billing processes will reduce errors, improve efficiency, and optimize service delivery, ultimately enhancing customer satisfaction, fostering loyalty, and providing a competitive market advantage.

3. To Improve Cost-Effectiveness and Operational Efficiency for Small to Medium-Sized Resorts

By automating key tasks, resorts can lower operational costs, improve productivity, and allocate resources more effectively, ultimately driving both cost savings and higher operational efficiency.

Scope and limitations of the study

Scope of the Study

This study aims to design and develop the Luna Bay Resort App, an integrated management system designed for the needs of small to medium-sized resorts. By integrating essential management tasks into a single system application, the study aims to increase Luna Bay Resort's operational effectiveness, lower manual error costs, and improve customer satisfaction.

The target users of this system are Luna Bay Resort's management, office workers, and the employees who are involved in booking, scheduling, billing, and maintenance activities. Employees are expected to benefit from a more straightforward and efficient workflow, and guests are expected to have a more smooth and convenient experience.

During the course of the four-month study, processes including requirements collecting, system design, software development, and testing will be covered. Features including scheduling, financial monitoring, point-of-sale (POS) systems for food services and rentals, booking administration, and inventory management will all be included in the suggested program, which would have an intuitive user interface.

Limitation of the Study

Several limitations may affect the research's conclusions. The study's limited five-month duration is one of its main limitations. This short time frame might not accurately represent the long-term advantages or difficulties of using the app, and it might limit the capacity to make progressive changes in response to thorough feedback.

The outcomes of the study may also be impacted by external factors such as changes in the economy or unexpected technical issues. These limitations will be taken into account in the evaluation but will not significantly affect the overall objectives of the study.

Review of related literature/studies/systems

Integrated management systems have been growing in popularity in the hospitality sector in recent years as a way to improve service delivery and streamline operations. With research and studies demonstrating that these solutions are useful in addressing common operational difficulties, the usage of technology to manage reservations, scheduling, billing, and resource tracking has increased. In order to develop an integrated management system, like the Luna Bay Resort App, this review examines a number of studies, theories, and technology developments.

Importance of Integrated Management Systems for Small and Medium-Sized Resorts

In the competitive resort hospitality industry, efficient operations are critical to ensuring high levels of client satisfaction and operational profitability. According to Karyamsetty and Magd (2020), small and medium-sized enterprises (SMEs) like resorts can benefit significantly from using an integrated management system (IMS), which integrates different operational activities into a single system. This approach not only reduces redundancy but also improves productivity and service quality, enabling these resorts to run more efficiently in a highly competitive market.

By implementing an IMS, SMEs in the resort business can match their operational procedures with technological improvements, allowing them to provide quality services on par with larger competitors. IMS adoption helps in managing resources to ensure and improves overall customer service. As a result, integrated management enables small to medium-sized resorts to solve operational challenges, streamlining operations, and promoting sustainability and cost effectiveness. This system's integrative approach to management is especially beneficial since it assists resorts in addressing different issues like customer satisfaction, resource allocation, and service consistency, all of which are critical for long-term business continuity and success in the hospitality industry.

This system's unified approach to management is especially valuable, as it helps small resorts address diverse areas like customer satisfaction, resource allocation, and service consistency, which are essential for long-term business continuity and growth in the hospitality sector.

Impact on Customer Satisfaction and Competitive Advantage`

The implementation of an integrated resort management system was designed to directly address features that impact customer satisfaction, giving the resort a competitive advantage. This integrated system seeks to improve operations and reduce errors that might have a negative influence on the customer experience by integrating important services such as booking, scheduling, point-of-sale (POS) transactions, and financial tracking.

According to Bhuian (2020), consumer satisfaction in hospitality is determined by aspects such as prompt service, clear communication, attentive staff, and well-maintained facilities. The research's review of service quality dimensions such as dependability, empathy, tangibles, responsiveness, and assurance. Thus shows that each has a different impact on customer satisfaction, with reliability having the most significant impact. Emphasizing dependable and consistent service standards ensures that guests are confident in their experience, which is especially important in retaining a competitive edge in a highly competitive industry.

With the Luna Bay Resort App, these service quality aspects can be optimized. For instance, the app's scheduling section allows the resort to manage rooms availability and align resources with peak demand periods, ensuring that guests receive attentive, timely service. Furthermore, the POS system consolidates billing for all resort services, providing customers with a seamless payment experience that reduces delays and billing problems, which is important in achieving customer expectations for reliability and convenience.

Furthermore, the app's integrated system enables smoother interactions between guests and resort staff. This ensures that customers' demands are met promptly, leading to greater degrees of satisfaction. By delivering real-time data insights, the system allows management to respond promptly to customer needs and make intelligent service quality adjustments especially during peak and off-peak hours. This not only improves customer satisfaction, but also gives Luna Bay Resort a competitive advantage in the market, since customers prefer resorts that offer efficiency and modern amenities.

Cost-Effectiveness and Operational Effectivity for Small to Medium-Sized Resorts

In the highly competitive resort industry, small to medium-sized resorts often face challenges in achieving cost-effectiveness and operational efficiency. The ability to offer excellent customer service while maintaining minimal operational expenses is essential for long-term profitability and success. According to Mittal et al. (2005), small resorts can achieve cost-effective service excellence (CESE) by implementing strategies that balance service quality and operational effectiveness. One way is to implement a dual culture plan, in which leadership develops a culture of both service quality and cost-efficiency. For small resorts like Luna Bay Resort, this might involve creating streamlined operations using technology, such as an integrated management system, that allows staff to focus on high-quality guest interactions while decreasing manual activities like booking, paying, and scheduling.

Furthermore, staff take care of administrative tasks by automating processes such as booking, payment, and scheduling, allowing them to focus on providing high-quality experiences for customers. This method not only improves operating efficiency, but also ensures that guests receive the attention and service they expect, resulting in higher customer satisfaction while keeping operational costs in check.

In addition to automating daily operations, implementing an integrated management system allows resorts to better track and manage resources in real time. Booking management, maintenance scheduling, and financial tracking can all be integrated into a single system, giving resort managers a full overview of daily operations. This greater visibility enables more informed decision-making and ensures that resources are deployed efficiently, avoiding waste and the risk of errors. With this integrated system, it will benefit the small to medium-sized resort in terms of cost effectiveness and operational effectiveness.

METHODOLOGY

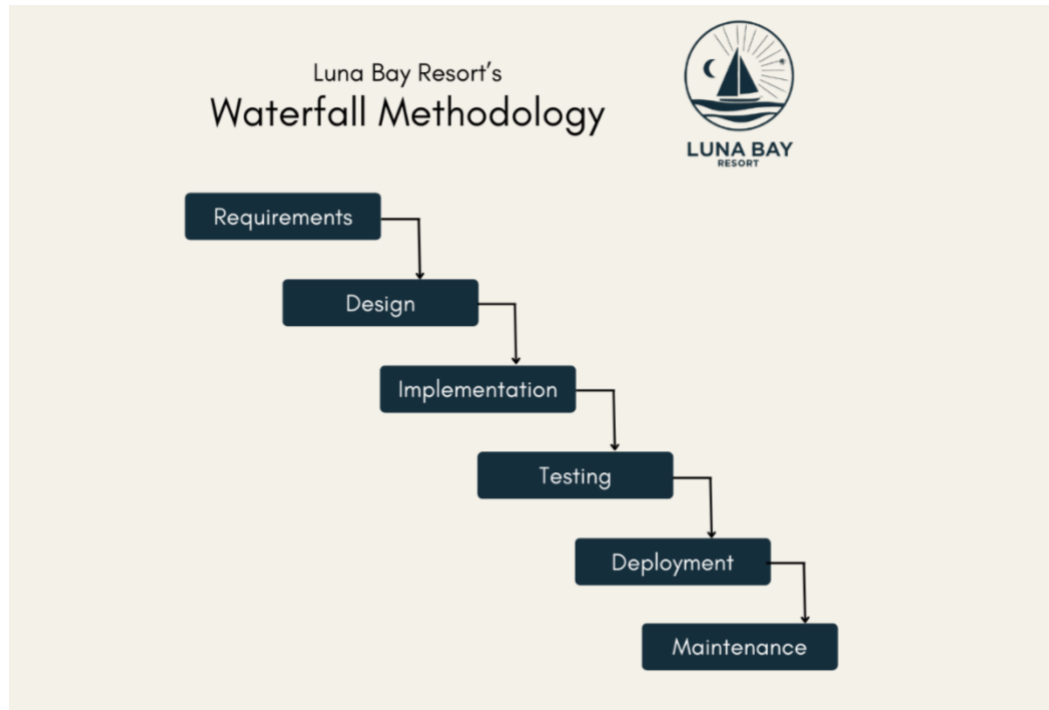


Figure 1 – Luna Bay Resort's Waterfall Model

The development of the Luna Bay Resort App follows the Waterfall Model, an established and structured software development approach. This approach is suitable for the project as it guarantees that every stage is finished before it moves on to the next and establishes specific time frames and objectives. The stages of the methodology are the following:

1. **Requirements:** Using relevant research on integrated management systems in the resort industry, the project began with an in-depth analysis of the resort's operational needs. With an emphasis on work automation, error reduction, and enhancing the experience of customers, this helps in identifying the essential features needed for the app.
2. **Design:** Based on the gathered requirements, the system design concentrated on integrating critical management tasks into a single platform. To represent component interactions and provide a clear system architecture, visual diagrams like flowcharts and ERDs were developed.

3. **Implementation:** Before incorporating every component into the entire system, the team started coding the app in stages. The primary goal was on developing a user interface that was intuitive for employees and using technologies that ensured scalability.
4. **Testing:** After implementation, the system went through testing to identify bugs and ensure each module operated accurately. Performance, security, and usability were verified using both functional and user acceptance testing (UAT).
5. **Deployment:** The app was made available at the resort after testing went successfully. The technology was integrated into daily operations for functions including scheduling, billing, and booking after staff members received training on how to utilize it.
6. **Maintenance:** To guarantee continued functionality and enhancement, the system will receive routine maintenance after release to handle problems, correct bugs, and take into account input from employees and visitors.

System Design Specification

This section represent the overall system specifications and functional requirements, providing a detailed breakdown of the components, including hardware and software elements. System processes are visually represented through Business Process Management Notation (BPMN) diagrams to illustrate different aspects of the system's functionality and component interrelations.

System Overview

The Luna Bay App comprises five primary system each aimed at streamlining resort operations:

1. **Login System:** This system secures access to the app through a role-based login mechanism. It verifies user credentials upon login and assigns access permissions according to roles (e.g., manager, front desk, or maintenance staff). This ensures that users can only interact with authorized sections of the system, enhancing security and protecting sensitive data.

2. **Booking and Scheduling System:** This system is designed to make reservations for amenities, rooms, and guests more effectively. In order to avoid conflicts and maximize occupancy, it enables the front desk and management to add, modify, or cancel reservations. In order to lower the possibility of no-shows, automated alerts are also incorporated to confirm reservations and issue reminders.
3. **POS System:** Reservations for rooms, meals, and facilities are all handled through the POS (Point-of-Sale) Module. It facilitates the processing of payments, inventory management, and the booking of services like dining or swimming pools. The management is informed about low-stock items by real-time inventory notifications, which guarantees continuous service and effective resource allocation.
4. **Maintenance System:** This system is designed to manage and track maintenance requests, this module allows staff to log issues and assign tasks to maintenance personnel. Task status and progress can be monitored, facilitating timely resolution and prioritization of maintenance requests based on urgency. This system helps ensure that the resort's facilities remain in optimal condition for guests and staff.
5. **Financial Tracking System:** This system consolidates data from the Scheduling and POS modules to generate financial insights. Through this module, management can view revenue breakdowns, analyze booking trends, and track employee performance, supporting informed decision-making. It includes financial reporting tools for monitoring weekly and monthly summaries, aiding in the resort's financial planning and operational assessments.

Functional and Non-Functional Requirements

1. Functional Requirements

1.1 Manage Bookings

REQ001: The system shall allow the front desk and managers to create new bookings.

REQ002: The system shall allow managers to set booking parameters (e.g., check-in/check-out dates, room selection, and service options).

REQ003: The system shall allow authorized staff to update or cancel bookings when necessary.

REQ004: The system shall track and display booking status changes.

1.2 Manage Room Status and Maintenance

REQ005: The system shall allow only the Maintenance Manager to update room statuses (e.g., "Under Maintenance," "Available").

REQ006: The system shall allow maintenance staff to report issues for review by the Maintenance Manager.

REQ007: The system shall automatically set a room's status to "Under Maintenance" upon guest checkout.

REQ008: The system shall log and display the maintenance history for each room, showing who made changes and when.

1.3 POS System

REQ009: The system shall allow authorized staff to manage and process orders for food, equipment, and activity reservations.

REQ010: The system shall display real-time inventory alerts to notify the manager of low stock levels.

REQ011: The system shall support cash and online payment options.

REQ012: The system shall adjust menu options based on the time of day (e.g., breakfast, lunch, dinner).

1.4 Financial Tracking

REQ013: The system shall allow administrators to generate financial reports, with breakdowns by room, services, and other revenue sources.

REQ014: The system shall allow managers to view weekly and monthly booking summaries and revenue reports.

REQ015: The system shall track and display employee attendance and hours worked.

1.5 Employee Management

REQ016: The system shall allow administrators to manage employee roles, including adding, deleting, or modifying roles.

REQ017: The system shall record daily attendance, showing time-in and time-out logs for each employee.

1.6 Calendar and Notifications

REQ018: The system shall allow users to view bookings and transactions by selecting specific dates.

REQ019: The system shall provide real-time notifications for key events, such as guest checkout, low inventory, or successful payment processing.

1.7 User Activity Log

REQ020: The system shall track user actions for sensitive functions, such as financial report access and role updates.

REQ021: The system shall store activity logs securely for auditing purposes.

1.8 Authentication

REQ022: The system shall authenticate users through a login using unique employee credentials.

REQ023: The system shall support two-factor authentication for administrators and managers.

1.2 Non-Functional Requirements

1.2.1 Operational Requirements

REQ024: The system shall connect wirelessly to a central database for storing and retrieving data.

1.2.2 Performance Requirements

REQ025: The system shall load the dashboard and main forms in less than 2 seconds.

REQ026: The system shall process and record transactions in real-time.

1.2.3 Security Requirements

REQ027: The system shall encrypt all sensitive data, including financial records, booking details, and employee credentials.

REQ028: Only authorized personnel shall have access to create or modify bookings and financial records.

1.2.4 Cultural and Language Requirements

REQ029: The system shall support English as the default language for all users.

Software and Applications

In developing the Luna Bay Resort App, the developers utilized specific software applications and programming languages to ensure a robust, user-friendly, and cost-effective solution.

Programming Languages

1. **C#:** The developers used C# as the primary language for the Luna Bay Resort app due to its object-oriented features, which are essential for organizing and managing complex features like scheduling, financial tracking, and POS functions. The app's business logic is supported by a modular structure that we created using C#, which facilitates maintenance and development.
2. **SQL:** The developers used SQL to handle the app's data storage and retrieval needs, providing a secure structure for managing extensive transactional data required by the resort's operations. The developers ensured sure that important information, including reservations, financial records, and equipment rentals, could be securely saved and effectively accessible in real-time by utilizing SQL.

Software Technologies

1. **SQL Server Management Studio (SSMS):** The developers utilized SQL Server Management Studio to manage and maintain the resort's SQL database effectively. With the use of SSMS, the team was able to precisely and securely arrange data while performing essential operations including database backups and optimization to handle large transaction volumes.
2. **Visual Studio WinForms:** The developers utilized Visual Studio WinForms to create the app's user interface, which features a responsive and usage-friendly approach for resort management and employees. Using WinForms' drag-and-drop feature, the team was able to promptly create and modify the user interface, making the scheduling, transaction, and inventory sections of the software all easy to us

Illustration of System Interactions using BPMN

In this section, the developers utilize Business Process Modeling Notation (BPMN) to represent the key interactions and workflows within the system. BPMN diagrams improve comprehension of system functionality and flow by visualizing the order of tasks, roles, and system elements involved in each process.

Booking and Scheduling System

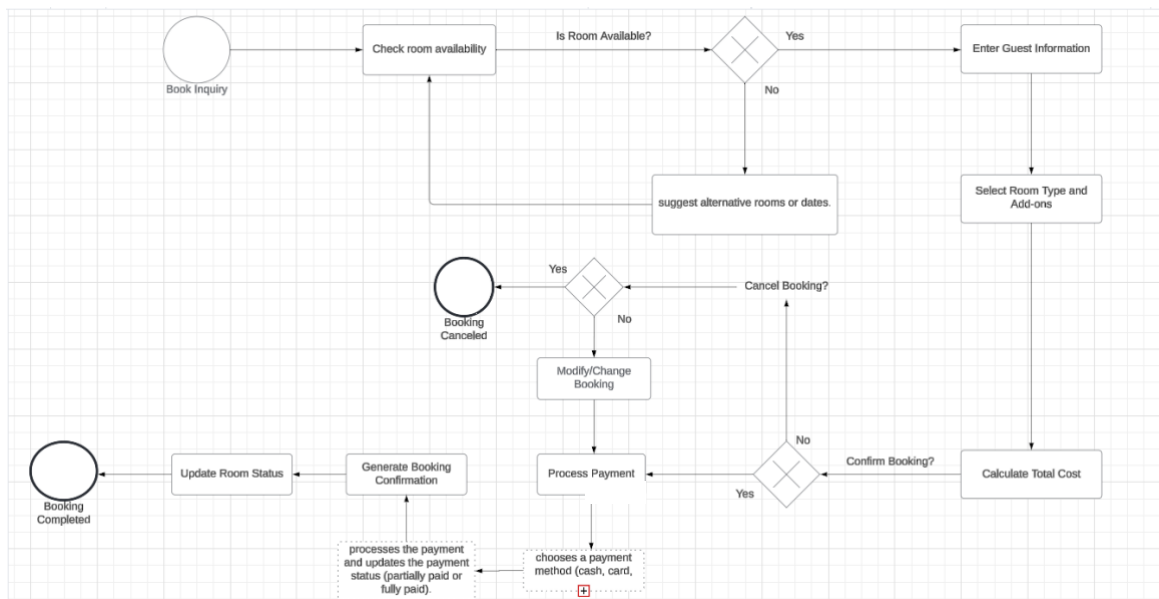


Figure 2 – Booking and Scheduling System's BPMN

This BPMN diagram represents the booking workflow for the Luna Bay Resort. The process begins with a booking inquiry, where room availability is verified. If a room is available, guest information is entered, followed by the selection of room type and add-ons, and calculation of the total cost. The workflow then proceeds to a decision point where the guest can confirm or modify the booking. Upon confirmation, the system processes the payment, generates a booking confirmation, and updates the room status, completing the booking process. The diagram also accounts for scenarios where rooms are unavailable, offering alternative options, as well as options for canceling or modifying existing bookings.

Login System

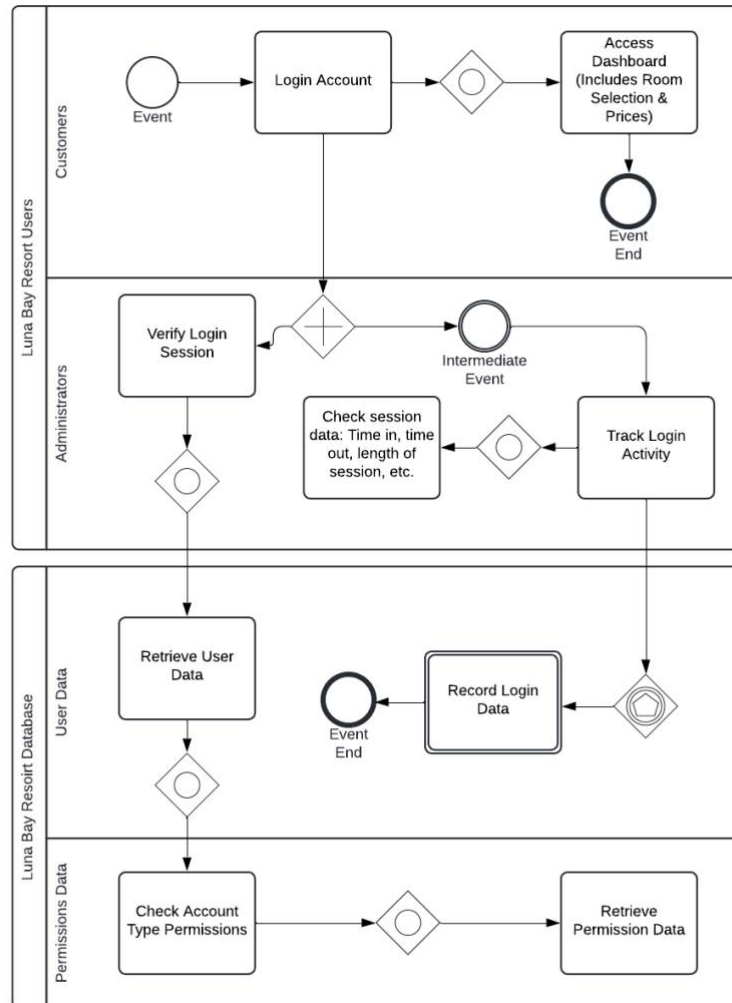


Figure 3 – Login System's BPMN

This BPMN diagram shows the login process for users accessing the resort's system. It begins with the customer logging into their account to access the dashboard, where they can view room selections and prices. The system then verifies the login session, checking session details like time in, time out, and session length. Login activities are tracked, and user data is retrieved to confirm account permissions based on user type. The system records login data and grants access as per the user's permissions. This workflow ensures secure access to the system based on user roles and activity tracking.

Point-of-Sale (POS) System

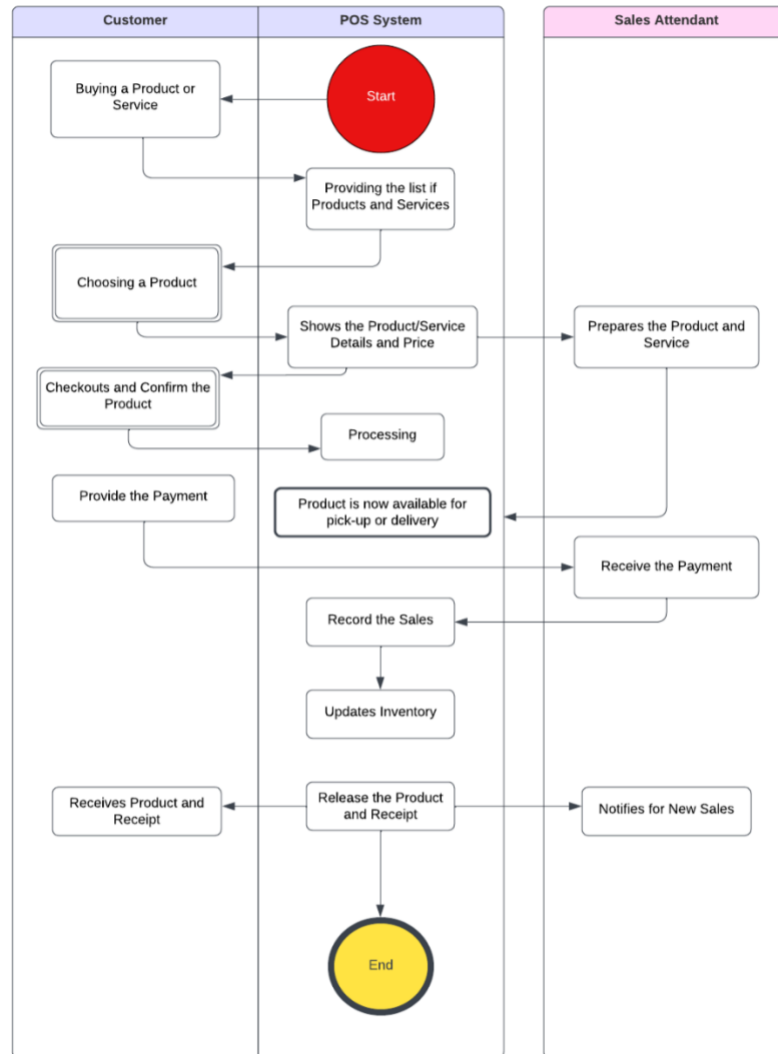


Figure 4 – POS System's BPMN

This BPMN diagram illustrates the Point of Sale (POS) workflow at Luna Bay Resort. The process starts with a customer initiating a purchase by choosing a product or service. The POS system provides a list of available options, and after the customer selects a product, it displays the details and pricing. The sales attendant then prepares the product or service. After the customer confirms the selection and completes the payment, the system processes the order, records the sale, updates inventory, and makes the product available for pickup or delivery. Finally, the sales attendant releases the product and receipt to the customer, marking the end of the transaction.

Maintenance System

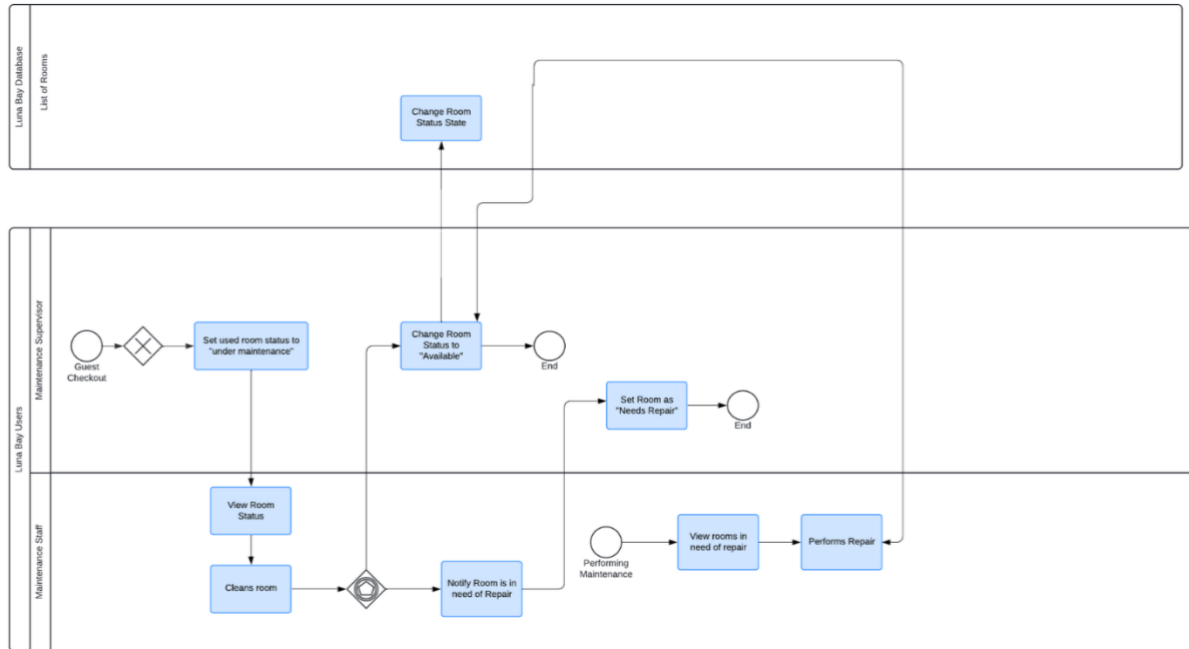


Figure 4 – Maintenance System's BPMN

This BPMN diagram depicts the room maintenance and status update process post-checkout. When a guest checks out, the maintenance supervisor sets the used room's status to "under maintenance." Maintenance staff view the room status and clean it. If repairs are needed, the room is marked as "needs repair" and the maintenance staff are notified. The maintenance team performs any necessary repairs, after which the room's status is updated to "available," ready for the next guest. The workflow ensures that room availability and maintenance statuses are properly tracked and updated.

In conclusion, These BPMN diagrams provide an in-depth analysis of Luna Bay Resort's several workflows, including important operational procedures like reservations, login, point-of-sale, and maintenance. The diagrams improve comprehension of how the resort's systems interact with one another and facilitate effective service delivery by providing a detailed visual representation of each workflow. These diagrams serve as valuable tools for developers and stakeholders, clarifying system functionality, promoting efficient process management, and ensuring seamless guest experiences at the resort.

[https://www.bookingninjas.com/blog/what-is-a-property-management-system-pms#what is a property management system?](https://www.bookingninjas.com/blog/what-is-a-property-management-system-pms#what_is_a_property_management_system?)

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