



Project Phase 0 Co-Working Space Management

By

6488072	Pachanitha	Saeheng
6488086	Chutweeraya	Sriwilailak
6488100	jiraruch	Tantiyavarong
6488106	Ratsorn	Thananannathinee
6488189	Chommakorn	Sontesadisai
6488190	Nattanicha	Sinsawet

Present to

Asst. Prof. Dr. Thanwadee Sunetnanta

Dr. Chaiyong Ragkhitwetsagul

Dr. Morakot Choetkiertikul

A Report Submitted in Partial Fulfillment of the Requirements for
ITCS371 Introduction to Software Engineering Faculty of Information and
Communication Technology Mahidol University
Semester 1/2023

Table of Contents

	Page
Introduction	1
Functional Requirements	5
Non-Functional Requirements	6
Requirement with cutting-edge technologies	7
Identifying Actors	9

Introduction

The proposed venture entails the development of an advanced co-working space management system. As the business analyst, it will facilitate seamless collaboration between customer requirements and the development team. The goal of this project is to build a robust web-based platform that caters to the dynamic needs of co-working space providers, allowing them to transform their spaces into efficiently managed and flexible work environments.

This comprehensive system addresses the multifaceted requirements of building owners, customers, employees, and managers, encompassing various features and functionalities that ensure a smooth operational flow. On the customer front, the system introduces a membership hierarchy, enabling users to create accounts by furnishing essential details such as their first name, last name, address, and phone number. This account creation process serves as the foundation for customers to apply for diverse membership options, including daily, monthly, or yearly plans, tailored to their individual preferences and usage patterns.

To streamline the booking and payment process, the system necessitates customers to make upfront payments corresponding to their selected time slots and membership plans. This integrated payment mechanism accommodates diverse payment methods, including credit cards, bank transfers, and True Wallet, fostering convenience and flexibility for users. Additionally, customers have the prerogative to cancel their bookings up to a day before the reserved time, offering them a degree of flexibility while ensuring a refund policy.

For employees actively managing the co-working spaces, the system offers a suite of tools and functionalities to optimize their operational efficiency. These features encompass the ability to oversee reservations, manage equipment inventory, and ensure security through a connected CCTV system. The integration of the CCTV system bolsters security measures, enabling employees to monitor the premises in real-time and respond to any anomalies promptly.

To empower managers with actionable insights, the system equips them with the capability to access comprehensive revenue reports, encompassing daily and monthly earnings. This data-driven

approach allows managers to assess the financial health of the co-working space, make informed decisions, and optimize resource allocation. Managers are further bestowed with administrative privileges, enabling them to manage employee information, add or remove accounts, and ensure a streamlined workforce management process.

From a technical standpoint, the system is engineered to accommodate a substantial user load, capable of storing data for up to one million users while facilitating concurrent usage by up to 1,000 users at any given moment. To safeguard user information, the system employs data encryption techniques, ensuring the confidentiality of sensitive details such as names, addresses, and phone numbers. The aesthetic aspect of the system is not overlooked, with a visually appealing blue and white color theme adopted to enhance user experience and align with brand identity.

Furthermore, the system's integration with a banking API simplifies the process of bank transfers, facilitating seamless financial transactions. In cases where booking slots remain unpaid, a 30-minute reservation window is allocated before the slot is released, optimizing resource allocation and availability.

Lastly, the envisioned co-working space management system encapsulates a myriad of features to cater to the diverse needs of building owners, customers, employees, and managers. This holistic approach ensures a well-rounded and user-centric solution that enhances operational efficiency, user experience, and managerial insights, positioning co-working spaces for optimal success in the modern business landscape.

Project Description:

The project involves developing a web-based co-working space management system. This system will serve building owners who want to convert their spaces into co-working spaces. The system will include features for both co-working space customers and employees. You will be in charge of gathering customer requirements and communicating them to the development team as the assigned business analyst.

Customer Information:

The primary customer is Adam Chia Young, who will serve as the business analyst for the project. The end-users of the system will be the building owners looking to manage their co-working spaces and the customers who will use these spaces.

Business Description:

The business's goal is to assist building owners in efficiently managing their co-working spaces. The co-working spaces operate on a rental basis, with customers able to join on a daily, monthly, or annual basis. Customers will be able to schedule time slots and pay for them using a variety of payment methods..

System Functions:**1. Membership System:**

- Customers can create an account with their first name, last name, address, and phone number.
- After creating an account, customers can apply for different membership options, such as per day, per month, or per year.

2. Booking and Payment:

- Customers must pay upfront for their selected time slots (daily, monthly, yearly) based on specified prices.
- Customers can book time slots for co-working spaces, specifying the number of desks they need.
- The system will display available dates and times for booking, considering the availability of desks and chairs.
- Payment methods include credit cards, bank transfers, and True Wallet.

3. Cancellation:

- Customers can cancel bookings one day before the reserved time to receive a refund.

4. Employee Features:

- Employees can use the system to check reservations, manage equipment, and monitor stock.
- The system will connect to the CCTV system for security monitoring.

5. Manager Features:

- Managers can log in to the system to view revenue reports, including daily and monthly income.
- Managers can manage employee information, including adding and deleting accounts.

System Requirements:

1. **User Capacity:**
 - The system should store data for up to one million users.
 - It should support up to 1,000 concurrent users at any given time.
2. **Data Security:**
 - Customer data (name, address, phone number) must be encrypted in the database.
3. **Design:**
 - The system's design should follow a blue and white color theme.
4. **Payment Integration:**
 - The system should integrate with a banking API for bank transfers.
5. **Booking Timeout:**
 - Unpaid booking slots will be reserved for 30 minutes before being released.

The information provided outlines the scope, functionality, user requirements, and technical specifications of the project. As a business analyst, your job is to make sure these requirements are properly documented and communicated to the development team so that they can be implemented.

Functional Requirements

Requirement ID	Requirement Statement	Comment
Create account		
FR001	Customers are required to create an account by providing their first name, last name, phone number, and address.	
Customer membership		
FR002	Customers can select a membership type that is available on a yearly, monthly, or daily basis.	
FR003	Customers can choose from different membership prices based on varying benefits.	
Reservation		
FR004	The system should display the available seats and time slots.	
FR005	Customers must indicate the number of seats and select a time slot.	
FR006	Employees can utilize the system to view individuals who have reserved the co-working space.	
FR007	The manager's system needs to aggregate the number of reservations and the total income for each day and month.	
FR008	Offer private meeting rooms equipped with audio and video conferencing tools.	
FR009	An online booking system is available for members to reserve workspaces in advance.	
Payment		
FR010	Customers are required to make a deposit or upfront payment when booking available seats.	
FR011	The payment function should only enable users to utilize credit cards, bank transfers, or TrueWallet.	
FR012	The system should automatically calculate the required deposit amount.	
FR013	The cost incurred each day must be recorded in the system.	
Cancellation		
FR014	In the case of a cancellation, customers must cancel their reservation at least 1 day before the reserved time starts to be eligible for a refund.	
Employee management		
FR015	The manager can review the revenue from each day and month to generate a revenue report.	
FR016	The employee can utilize the system to verify the availability of equipment or supporting items in the stock.	
FR017	Employees can view and manage co-working space reservations.	
FR018	The manager can oversee employee information by adding, deleting, or modifying any employee in the system.	
Security		
FR019	The employee's system needs to be connected to the CCTV for monitoring purposes.	
FR020	Implement robust cybersecurity measures to safeguard member data, payment information, and any sensitive business data.	

Nonfunctional requirements

Requirement ID	Requirement Statement	Comment
NR001	The system must be accessible via the internet as a website.	
NR002	The system can store up to one million members' information in its database.	
NR003	The system can accommodate up to 1000 concurrent users on its website at any given time.	
NR004	To ensure customer data confidentiality, the system needs to encrypt the data in its database.	
NR005	The system's color scheme should predominantly consist of blue and white.	
NR006	The system needs to establish a connection with the banking API.	
NR007	The system shall automatically release booking slots that have not been paid for within 30 minutes of selection.	
NR008	Accessibility for individuals with disabilities must be ensured for the workspace.	
NR009	Regular data backups should be performed, and mechanisms for disaster recovery must be in place.	
NR010	The user interface should be intuitive and user-friendly for all user types.	

Requirement with cutting-edge technologies

- **Virtual Reality (VR)**

VR is the advanced technology chosen for website development. Customers can view 360-degree versions of both images and videos on the website using virtual reality. so that clients are aware of each room's layout and how to use it beforehand. Included are informational details and several amenities that are available for use in the space. Customers will feel more at ease and convenient thanks to VR. They will be able to know the amount of space and facilities in the room, in particular for visitors who have never been here before, or if they require more amenities. They will be able to let them know at the time of booking. Customers may interact and work with one another more realistically by using it in VR rooms.

Functional Requirements of VR

Requirement ID	Requirement Statement	Comment
FR001	The website provide the display of 360-degree images	
FR002	The VR representation should accurately display the amount of space and facilities in the room.	
FR003	The VR allow user to interact with virtual element.	

Nonfunctional Requirements of VR

Requirement ID	Requirement Statement	Comment
NR001	The VR system should support multiple devices	
NR002	Make sure the VR experience is accessible to individuals with disabilities by adhering to web accessibility guidelines.	

- **Artificial Intelligence (AI)**

The co-working space website will feature AI algorithms that analyze user preferences, offering personalized recommendations for suitable spaces. An AI-driven booking system will provide real-time availability, suggest optimal time slots, and ensure instant confirmations. Behavioral analysis through AI will enhance business strategies, while AI-integrated chatbots will efficiently handle customer inquiries and resolve common issues.

These AI functionalities will respond promptly for a smooth user experience, while scalability ensures optimal performance with increased user activity. High-quality data maintenance for AI training will boost prediction accuracy, fostering a platform that seamlessly blends AI capabilities with user-centric efficiency.

Functional Requirements of AI

Requirement ID	Requirement Statement	Comment
FR001	Develop AI algorithms that analyze user preferences and recommend suitable co-working spaces based on their requirements.	
FR002	Implement AI booking system to offer real-time availability, suggests optimal time slots, and provides instant confirmations.	
FR003	AI algorithms to analyze user behavior and feedback to improve the business.	
FR004	AI integrate a chatbot or AI-driven support system to handle customer inquiries, provide assistance, and resolve common issues.	

Nonfunctional Requirements of AI

Requirement ID	Requirement Statement	Comment
NR001	AI-driven functionalities should respond promptly and provide accurate results to ensure a smooth user experience.	
NR002	AI systems should be scalable to accommodate increased user activity without degrading performance.	
NR003	Maintain high-quality data for AI training and analysis to improve the accuracy of predictions and recommendations.	

Identifying actors

Actor	Associate class
<p>Customer</p>	<p>Create Account</p> <ul style="list-style-type: none"> Customers must create an account and enter their name, surname, address, and phone number. <p>Membership Registration</p> <ul style="list-style-type: none"> After successfully creating an account, customers can register for the membership. <p>Select Member Type</p> <ul style="list-style-type: none"> Customers can select from three types of membership they would like to subscribe to: daily, monthly, and annually. <p>Booking Co - Working</p> <ul style="list-style-type: none"> Customers can check the website for available rooms and make a reservation for the area they want to use. If payment for the reservation is not made within 30 minutes, the system will automatically cancel the reservation. <p>Check Room Availability</p> <ul style="list-style-type: none"> Customers can specify the number of tables and chairs they would like to use. The customers would be able to see the status of the date and time of coworking available / busy according to the customer's specifications. The number of tables and chairs can be specified as required. <p>Payment</p> <ul style="list-style-type: none"> Customers can choose to deposit or pay in advance for reservation areas in co-working. The amount of payment for each type of membership is varied. There are three types of payment available for customers to choose from: credit card, transfer, and TrueWallet. <p>Cancellation before use</p> <ul style="list-style-type: none"> Customers can cancel the reservation up to 1 day before the day of use, after which the deposit and advance payment will be refunded. If no cancellation is made, the customer will not be eligible for the refund.

Employee	<p>Manage and approve bookings</p> <ul style="list-style-type: none"> Employees are able to check and approve bookings from customers before confirming their access. <p>Manage the orderliness of the area</p> <ul style="list-style-type: none"> Employees can add or remove any facilities in the working space, such as chairs and drinks. <p>Checking facilities</p> <ul style="list-style-type: none"> Employees can check that the facilities and materials in the warehouse are sufficient for use, such as plugs and snacks. <p>Special approval</p> <ul style="list-style-type: none"> Employees can approve the rental of computer equipment for customers. <p>Usage report</p> <ul style="list-style-type: none"> Employees must summarize reports on income, costs, or other important matters and record them in the system. <p>Checking room status</p> <ul style="list-style-type: none"> Employees can check the current status of the rooms and all areas. <p>Edit room status</p> <ul style="list-style-type: none"> Employees can edit the room's status to available or unavailable to update the system.
-----------------	---

Manager	<p>View a Summary Report</p> <ul style="list-style-type: none"> Managers can view reports summarizing all operations, such as the number of bookings, revenue, and total usage status. <p>Usage and revenue reports</p> <ul style="list-style-type: none"> Managers can view reports on the space usage and the revenue generated from the service. <p>Manage employees information</p> <ul style="list-style-type: none"> Managers can add, remove, or manage the accounts of employees. <p>Manage area and room details</p> <ul style="list-style-type: none"> Managers can edit the area and room details. <p>Set and manage prices and membership types</p> <ul style="list-style-type: none"> Managers can set the price and type of membership for customers. <p>Store users information</p> <ul style="list-style-type: none"> Managers must keep the personal data of customers, such as name, address, and phone number, confidential. <p>Payment information</p> <ul style="list-style-type: none"> Managers must record all payment information, such as payment method, amount paid, and payment status
APIs Banking	<p>Payment</p> <ul style="list-style-type: none"> Users can use financial APIs to pay Co-Working Space rent via web site. <p>Checking Payment History</p> <ul style="list-style-type: none"> The web site Co-Working Space can use financial APIs to view the history of payments made by users. <p>Updating Space Reservation Status</p> <ul style="list-style-type: none"> The Co-Working Space web site can use financial APIs to update the reservation status after rent payment. <p>Submitting a Refund Request</p> <ul style="list-style-type: none"> Users can use financial APIs to request a refund if a reservation is canceled or a Co-Working Space is used. <p>User Authentication</p> <ul style="list-style-type: none"> Co-Working Space applications can use financial APIs to authenticate users before booking or using the space.

Identifying actors

- Is a person or system that has a role in the use or interaction of the software.

- **Primary Actors:** This is a group that has role in operating the system or directly participating in the process of interacting with the software system. The operation of the software system is directly impacted by this, which could be either a person or a system.
- **Secondary Actors:** A system with a network relationship that provides services in response to user requests It also includes subprocesses that are invoked by the system to obtain data or results.
 - **Customer (Primary Actors):** Participate in overseeing and running the on-site co-working spaces. Including investigating and gathering client concerns.
 - **Employee (Primary Actors):** Responsible for managing all aspects of the Co-Working Space company, including planning, making decisions, marketing, and ensuring client happiness.
 - **Manager (Primary Actors):** Users of co-working spaces who require space reservations Utilization of various services and contact with co-working firms
 - **APIs Banking (Secondary Actors):** It aids in tying together company processes and effectively delivering a range of services.

