CoworkClub

18 May 2022

*Final project for the subject of **System Analysis**, class **P6**.*

Team

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1. Introduction

1.1 Executive Summary

In this report, we'll explore all the **results of the second iteration** of this project. In this phase a requirement analysis was performed based on the *Vision Report* produced in the last iteration, we selected the main goals a user would be interested in accomplishing and deconstructed them in search of the fundamental functions that enabled them to produce relevant results.

The breakthrough that **CoworkClub** brings to the market is the search and booking process's easiness when compared to the present methods of site-by-site search, because of this we consider the search and filtering capabilities and the booking process universalization should receive most of the effort when trying to gather information.

In this way, the **reengineering** of processes will focus on **optimizing** the process of **searching and booking** coworking spaces.

1.2 Version Control

Date	Editor	Changes
17 May 2022	David Araújo	Introduction section.
18 May 2022	David Araújo	Activity Diagrams. New work processes. Actors descriptions.
19 May 2022	David Araújo	Use Case Diagrams. Technologies & Environment
20 May 2022	David Araújo	Business rules Domain Model diagram
21 May 2022	Samuel Teixeira	Mapping of Domain Concepts
24 May 2022	Samuel Teixeira	Booking State Machine Diagram Life Cycle
25 May 2022	David Araújo	Persona

1.3 Strategy & Requirement Acquisition

Due to **constraints** in resources, like **time and access to target users**, our gathering techniques focused were:

1. **Brainstorming** sessions;
2. Study of **analogous systems**;

Techniques 1 and 2 were fundamental in acquiring the **main goals** and **structure requirements**, since it is the team that envisioned the concept, it is also much more familiar with the ultimate goals and structure to accomplish them.

When it comes to the review process of the requirements, the team will focus on the **informal review** process between its members, with a hierarchization of requirements taking place also in this phase so as to establish a prioritization to follow later on in the Development phase.

1.4 References & Supplementary Resources

- Identify and Outline Requirements;
- Guideline: Developing System-Wide Requirements Specification;
- Guideline: Identify and Outline Actors and Use Cases;
- Checklist: General Requirements;
- Guideline: Identify and Outline Actors and Use Cases;
- Coworker;
- Airbnb;
- 10 Usability Heuristics for User Interface Design.

2. Reengineering of Processes

2.1 New Work Processes

For the new processes, we can point out several new activities that the current solutions don't contemplate. For the visual representation, with activity diagrams, when chose two activities that we think are the most important since, the first one, describes the main feature of working with **CoworkClub**, and the second one describes the ease with which service providers can start using our service. These diagrams can be found at the end of the document, in the Annex section.

The first diagram, the Search and Booking Process, describes the following sequence of events:

1. A user reaches **CoworkClub** and searches for a space;
    a. This is done via a query specifying: location, date, and team size;
2. This query is received by **CoworkClub** which will return all the matching results;
3. If these results don't satisfy the user's request, he/she can refine the results with subsequent queries specifying filter options. If the results satisfy the user, he/she will proceed to browse the result in search of an interesting option;
4. Upon finding an option of interest, the user can select it. On selection, **CoworkClub** will retrieve that option's information and display it to the user;
5. On observing the information, like amenities, price, reviews, and score, the user, if satisfied, can proceed with selecting booking specifications, if not, he/she can continue browsing other spaces;
6. Once booking specifications, like date, time, office type, and extras, are selected, the user can proceed to the checkout;
7. Once selected, **CoworkClub** will automatically reserve the date, time, and office choice selection in order to prevent duplicate booking;
8. **CoworkClub** will now retrieve the user's payment information, and if valid, allow the user to proceed with payment;
9. Once the user agrees with payment, the Payment Service Provider, like Paypal or Visa, will receive the request for payment, and if valid, notify **CoworkClub** that the payment has been approved, if not, the interaction can go no further and the preventive reservation is canceled;
10. After payment is approved, **CoworkClub** will notify the Space Provider of the new booking request and await its confirmation of the registration of the booking;

11. Once the booking is confirmed, **CoworkClub** will simultaneously notify the user of the confirmation of the booking, update the availability of the Space in the **CoworkClub** platform permanently, and proceed with the payment to the Space Provider via a Payment Service Provider.

Once all of these previous steps are complete, the **booking is confirmed**.

The second diagram, the [Add Coworking Space](#), is much simpler and that is the main goal for the ease with which a Space Provider can add new Spaces.

1. The Space Provider begins the interaction by sending a request for a new entry about a Space, with an application containing all the important information about said space;
2. **CoworkClub** will proceed with the validation, if not valid, the Space Provider will need to re-apply, if valid, **CoworkClub** will begin registration in its database;
3. Once registered, the Space Provider will now have access to a Management Dashboard and will be asked to proceed with editing that space's profile;
4. The Space Provider will now edit the profile, by adding images, descriptions, directions, and other relevant information;
5. If these pieces of information are invalid, they will need to be re-edited, if not, the profile is updated;
6. Once the profile is updated and de Management Dashboard operational, this new space profile will be published in **CoworkClub**.

Besides these two important new processes, we can envision a series of new ones where **CoworkClub** would strongly increase effectiveness, like:

● Client booking management processes, with charting and calendarization of booking;
● Real-time and anytime interaction between provider and client;
● Consumer trends studies for space providers;
● Automation of comparison process between spaces;

2.2 Technologies & Environment

When it comes to the technology plan, **CoworkClub** is not facing the challenge of making a process digital that currently is physical, since booking is already a digital process, what it is doing is simplifying and universalizing the process.

For this, the main transformations we intend to implement are:

1. Centralization of information about coworking spaces;
2. Uniformization of a payment process with **CoworkClub** acting as a trusted intermediary;
3. Score and review-based ranking between providers;
4. Introduction of desktop and mobile channels;
5. AI integration with suggestions based on previous interactions;
6. Fomentation of a more active and competitive community that can drive innovation and demand, through an online community that favors innovation.

For the production phase, we have set a number o minimal requirements that need to be met, as well as a few directives that will need to be followed:

1. Web (desktop) and mobile support, based on **progressive web application** technology;
2. Backend (**database** and **authentication**) support, in order to allow account and profile creation;
3. Global reach;
4. Licensing and accreditation as a payment platform, obviously this will mean high levels of security are also needed;

3. Domain Model

3.1 Mapping of Domain Concepts

Concept of the Domain	Description
Booking	The act of reservation of a Coworking Space at **CoworkClub** by a Coworker
Bank	Financial institution. Its goal at **CoworkClub** is to help the process of payment of Coworking Spaces by the Coworkers. The Bank can either accept or decline the transaction
Office/Coworking Space	The space owned by the Space provider that was paid by the Coworker with the primary goal of using that space to work for a determined period of time
Calendar	An agenda with all the Bookings of an Office/Coworking Space of a Space Provider for all time frames

3.2 Life Cycle

When a Booking is made, it needs two approvals:

1. The Space Provider's approval:
   - The Space Provider will authorize or decline the Coworker (since the Space Provider owns the space that is being booked
2. The Bank's payment approval
   - The Bank must make sure that the payment has been made or if the Coworker is capable of paying for the service

If any of those approvals fail, the Booking ends. If both are conceded, the Space Provider must make sure that the Office/Coworking Space has all conditions to host the Coworker at the time of the Booking. If it does have, the Coworker will then enjoy the Booking. If something goes wrong, the Coworker must be warned about the impossibility of having the Booking.

4. Use Cases

4.1 Actors

Actor	Description
Worker	A remote worker, in need of a place to work for a specified time frame, who can book a space. That can post reviews. Can manage and cancel bookings. Has a unique user account. Has personal and secret preferences and information entrusted to the system.
Space Provider	A provider that has a space to receive customers, and needs a way to promote and expose the business to potential new customers. Need to be reached by costumers about booking information. Must prove that in fact owns a physical space with the specified requirements.
Payment Service Provider	Interact with **CoworkClub** and makes it possible to pay in multiple forms.

4.2 Use Cases - Overview

Again, in the use cases we tried to focus on the main aspects of the platform and in what makes it unique and powerful, so we explored some use cases but focused most of the effort on the booking process and new space addition.

Use Case		Description
User & **CoworkClub** Interactions	#1.1 Search	The user can search existing space by specifying a city, country, or current location and defining a radius, or without any specificity.
	#1.2 Search by office type	The user can search by office type/amenities available, by specifying one by one his/her needs.
	#1.3 Filter and specify search parameters	The user can search spaces based on the amenities, and team size acceptance.
	#1.4 Selection of a space	A user can choose from a list of spaces based on specific criteria compared among the spaces.
	#1.5 Profile	Manage personal information like payments and

Use Case		Description
	management	history of bookings
Space Provider & **CoworkClub** Interactions	#2.1 Update work-days calendar	The admin of a coworking space can update the working days or hours of a specific space for a specific time frame or without an end date.
	#2.3 Alter space specifications	The size and capabilities of a space can change and be updated, it can change ownership.
	#2.4 Study user trends	A space provider can observe and study its user's trends and preferences in order to keep its relevance within the clientele.
	#2.5 Add new spaces	A provider can add and edit the space under its administration.
User & Space Provider & **CoworkClub** Interactions	#3.1 Booking alterations	A booking can be edited to contemplate more or less time, more or fewer people, and access to amenities, …
	#3.2 Post a review	A user can post a review in order to evaluate his/her experience with a certain provider.
	#3.3 Exchange tickets	Providers and users can exchange messages relative to information or special requests.
	#3.4 Booking	Booking process takes all three actors to interact with reservation and payment processes.
	#3.5 Notify of important events	The admin of a coworking space must be able to notify the user booked for a specific time frame, about important events taking place that can disturb their work, like office maintenance.

4.3 Concepts & Use Cases

Use Case	Concepts			
	Query	Profile	Space	Application of Space
Search for Space	C		R	
Filter the results	U			
Compare results	R			
Profile management		C, U, D		
Adding Space			C	C, R
	Reviews	Booking	Messages	Payment
Post Review	C			
Study Trends	R	R		
Booking Process		C		
Booking Alterations		U, D		
Alerts			C, R	
Payment of booking				C

C - Create, R - Read, U- Update, D - Delete.

4.4 Persona

A **Use Case Diagram** can be found in the Annex section, for the Persona described below.

Name	Joaquim Ribeiro
Age	35 years old
Job	Chief Developer at Sonae
Location	Porto
Workplace	Works from a private office with ease of access to all necessary amenities and office supplies. Great place to take business meetings and interviews. Private and quiet.
Family life	Married and with 2 children. Stable life at home but demanding and with rigid schedules.
Current struggles	Work demands a great deal of traveling within Europe, with the need of speeding two to three on average at the destination. As the work doesn't stop and preparations for meetings are necessary, Joaquim always struggles to find a place to work, that meets all the requirements he is used to at his base office. Due to his demanding life schedule, he has limited time to pre-plan for his travels and most of the plan is done on-the-fly while traveling, this includes accommodations and working spaces to attend during his stay.
Goals	He would like not to worry about the search and preparation of a workplace during his travels. Ideally, he would like to arrive at the destination and already have a location he could go to and start working without having a cumbersome process or booking. Due to the workplace requirements, he is used to, he would like to narrow his choice to the places that meet these requirements.

5. Overall Issues

5.1 Business Rules

Below is a non-exhaustive table of **CoworkClub** business rules, containing the one considered to be fundamental to the sound working process of the platform.

Rule	Description
Receipt	For a checkout to be processed, a receipt of the transaction must be issued and stored.
Unique bookings	A determined office in a space for a determined time frame can only be booked by one person.
Price information	For a space to be published, a minimal price must be set and visible to the user.
Confirmation for payment	Since **CoworkClub** acts as a middle man, the Space Provider, upon receiving a booking request ticket, must confirm its registration, which is legally binding, to receive payment. This is done to protect the users from false registrations.
Space unique entry	Each space can only have one entry on the platform. This can be enforced with a limitation to the uniqueness of the location and is done to prevent duplicate bookings.
CoworkClub neutrality	**CoworkClub** is not responsible for misleading space information, nor does assure spaces' quality.

5.2 Non-Functional Requirements

This evaluation was done acknowledging the 10 Usability Heuristics for User Interface Design by Jakob Nielsen.

Usability Requirements		
Ref.	**Requirement**	**UC**

RInt. 1	The interface must follow the official color code:
	  - Blue: #283592;
	  - Pink: #e01b84;
		All

RInt. 2	The user can search without any input or with incomplete input, the system, in this case, must assume default values. This is done so a	UC #1.1

|		
	user that does not know what is his/her ideal space, can still browse through the available ones.	
RInt. 3	A minimalistic design, and resorting to industry-standard keywords and icons must be used to accomplish a more user-friendly environment.	All
RInt. 4	Filtering toolbar must be present at all times and display the status of the currently active filters.	UC #1.2 UC #1.3
RInt. 5	For the selection of space, important information relative to a space must be already visible before selecting it to expedite results comparison.	UC #1.4

Performance Requirements		
Ref.	**Requirement**	**UC**
RPerf. 1	The platform should support a large number of concurrent users	All
RPerf. 2	Should support a large database	All
RPerf. 3	Normal navigation between pages should be in less than 2 seconds	All
RPerf. 4	Results should be displayed in less than 3 seconds	UC #1.1 UC #1.2
RPerf. 5	User preferences should be saved in order to be served to Space providers	UC #2.4

Support and Technical Requirements		
Ref.	**Requirement**	**UC**
RSup. 1	Should be accessible from mobile and non-mobile devices	All
RSup. 2	Will be a PWA base in Vue framework	All
RSup. 3	Backoffice and SGBD should be handled by Firebase	All

6. Interactions Prototype
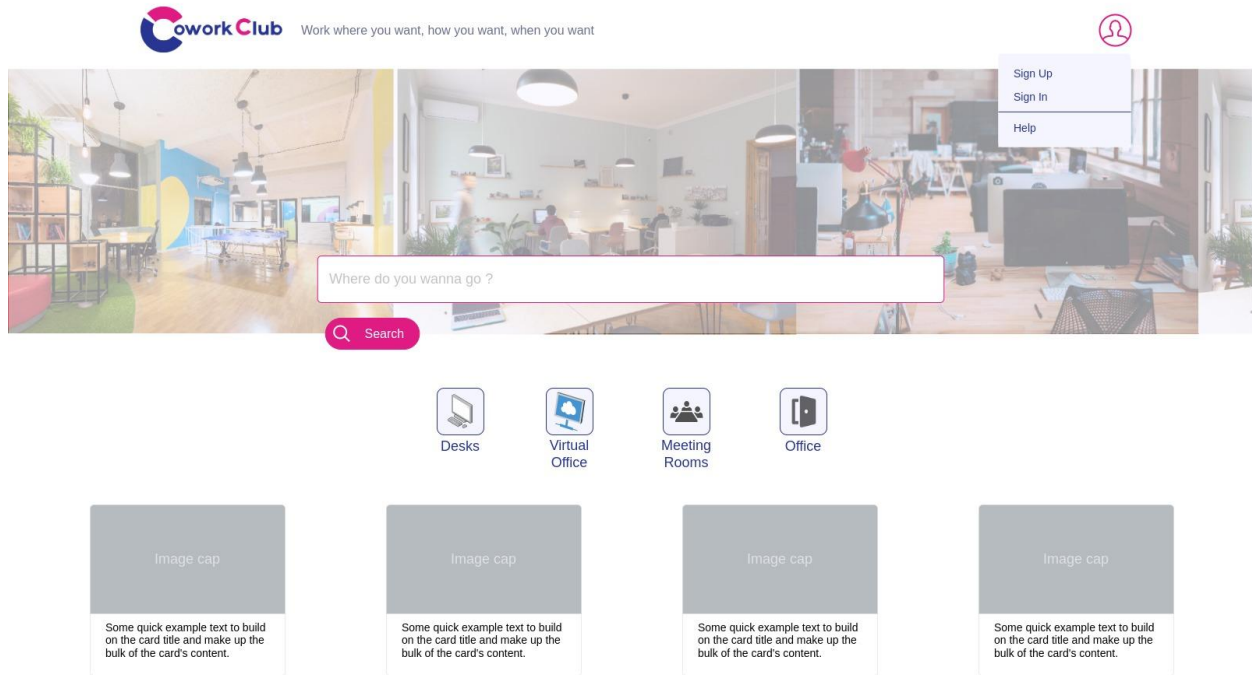
Prototype 1 - Home page with search bar and pre-filtered searches and space highlights
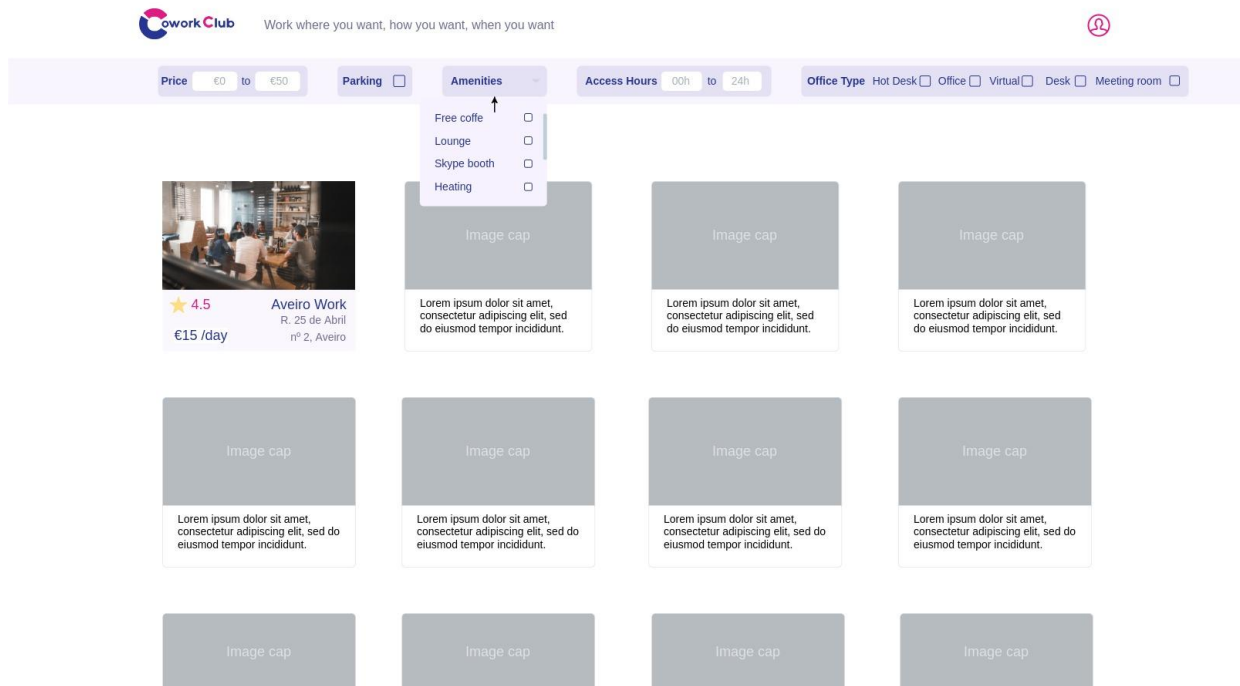
Prototype 2 - Search page with matching results in individual cards, displaying rating, name, price, location, and image of the space

owork Club Work where you want, how you want, when you want

World > Portugal > Aveiro > Aveiro

Aveiro Work ✔

📍 Rua 25 de Abril, nº 2, Aveiro, 3810-111 Aveiro - View on Map

4.5 / 5 ⭐
Read reviews ▶

Description

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

+ See more

🕐 Access Hours	Mon - Fri 09:00 am - 10:00 pm	Sat 10:00 am - 05:00 pm	Sun 01:00 pm - 07:00 pm

CHECK-IN
01/08/2022 - 10:00 am
CHECK-OUT
01/08/2022 - 07:00 pm
TEAM SIZE
1 person ▼
OFFICE TYPE
Hot Desk ▼

Book Now

💲 Pricing

Private Office   Hot Desk   Dedicated Desk   Virtual Office

Nº People	Duration	Price	Access Hours
1	1 Day	EUR 15	8h
1	1 Week	EUR 80	24h

💜 Amenities

Prototype 3 - Space's page with complete details (not all are in the picture), such as description, images, access hours, pricing options relative to the type of office, and amenities offered. Also a section for date selection, team size, and office type to proceed to book.

owork Club Work where you want, how you want, when you want

Booking at Aveiro Work

Total of **€80**

Duration: 26/06/2022 to 02/07/2022

Acess: 24h

Office type: Hot Desk

Amenities: + Free coffee
+ Access to lounge
+ Skype Both
+ Printer
+ Scanner

Facturation info
John Doe
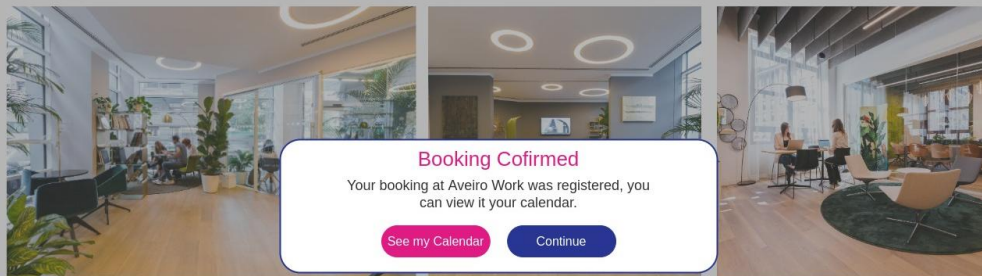Rua 1 de Janeiro, nº11
3700-900 Mira, Coimbra

Payment method

AMERICAN EXPRESS   P PayPal   mastercard.   VISA   DISCOVER
○   ○   ○   ○   ○

Confirm   Go Back

Prototype 4 - Checkout page with complete details selected for purchase, with confirmation of payment info and selection of payment method.

owork Club Work where you want, how you want, when you want

World > Portugal > Aveiro > Aveiro

Booking Cofirmed
Your booking at Aveiro Work was registered, you
can view it your calendar.

See my Calendar   Continue

Aveiro Work ✔

📍 Rua 25 de Abril, nº 2, Aveiro, 3810-111 Aveiro - View on Map

4.5 / 5 ⭐
Read reviews ▶

Description

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

+ See more

CHECK-IN
01/08/2022 - 10:00 am
CHECK-OUT
01/08/2022 - 07:00 pm
TEAM SIZE
1 person   ▼

Prototype 5 - Confirmation of booking with the option to visit the calendar and check the booking details.

Cowork Club — Work **where**, **when** and **how** you want

John Doe

About Me

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Eu non diam phasellus vestibulum lorem. Augue ut lectus arcu bibendum at varius vel pharetra vel.

Job Title
Software Developer

Spaces Visited
5

Next Stay
May 26th, Aveiro Work

Personnal Details

Name
John Williams Doe

Email
john_doe@gmail.com

Password
•••••

Address
Rua 1 de Janeiro, nº11
3700-900, Mira, Coimbra
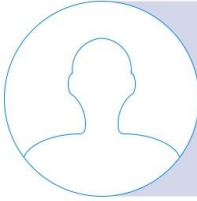
Calendar

June 2022

Mo	Tu	We	Th	Fr	Sa	Su
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

Aveiro Work
Check In - 10 am
See more

Prototype 6 - Profile page where the user can review his personal information and his calendar contains his previous, current, and future stays.

Cowork Club — Work **where**, **when** and **how** you want

John Doe

About Me

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Eu non diam phasellus vestibulum lorem. Augue ut lectus arcu bibendum at varius vel pharetra vel.

Job Title
Software Developer

Spaces Visited
5

Next Stay
May 26th, Aveiro Work

Calendar

June 2022

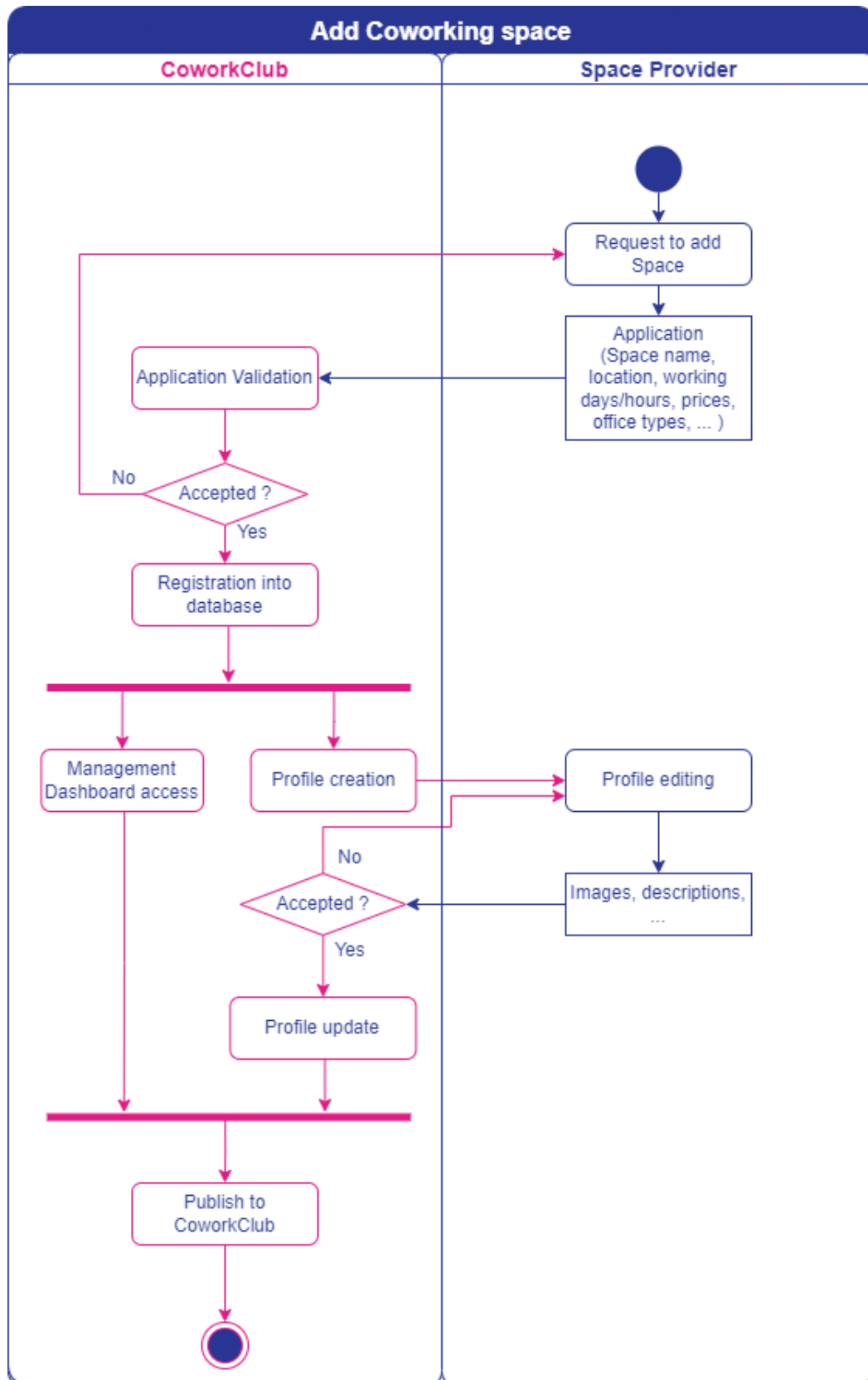| Mo	Tu	We	Th	Fr	Sa	Su
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

Booking

Aveiro Work
Check In - 10 am
Duration: 26/06/2022 to 02/07/2022
Acess: 24h
Office type: Hot Desk
Amenities:
+ Free coffee
+ Access to lounge
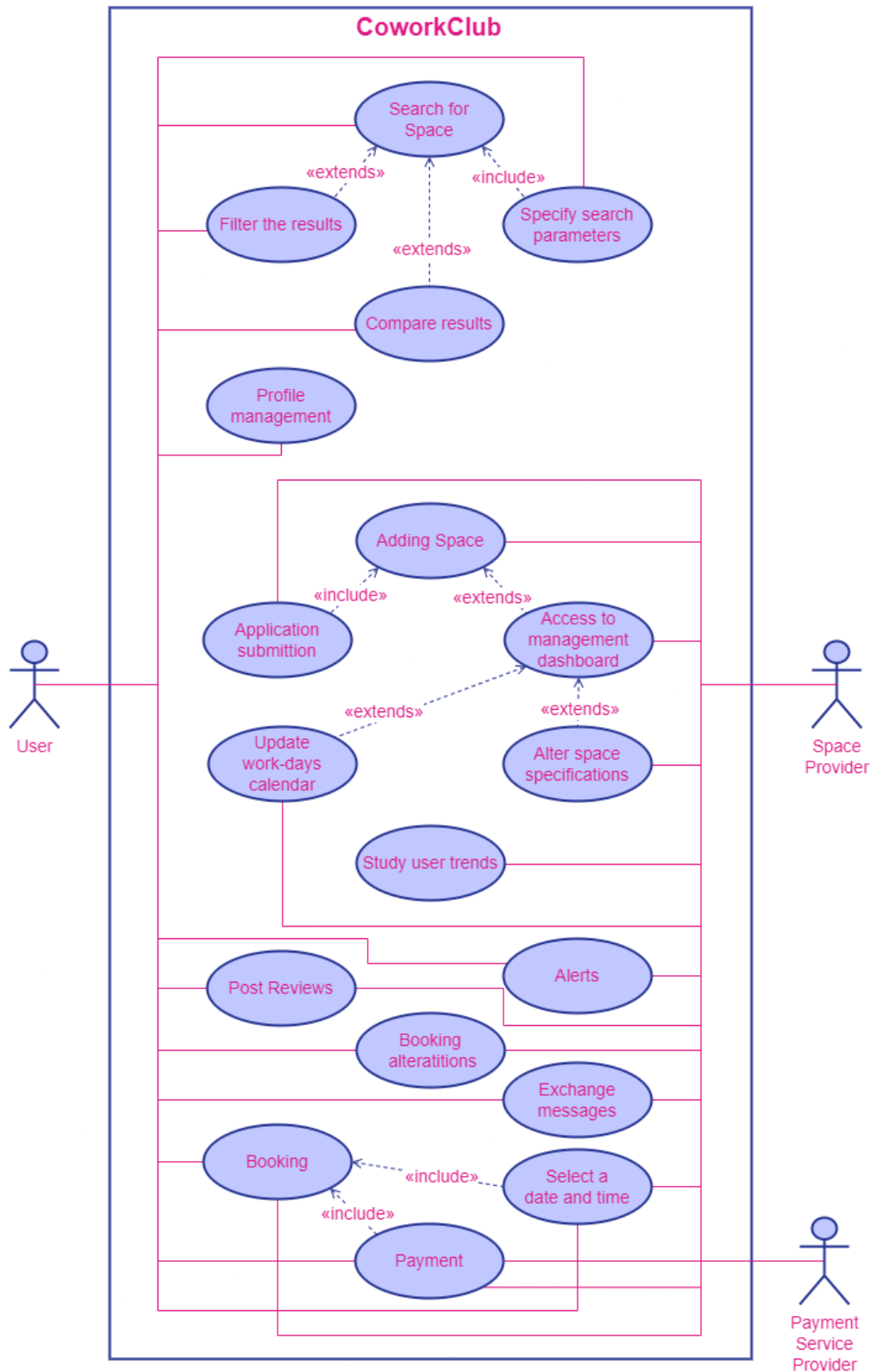+ Skype Both
+ Printer
+ Scanner
Team size: 1

Total of **€80**

Prototype 7 - Upon selecting specif dates on the calendar, with there's a booking taking place at that date, booking detail will be displayed.

Annex

Activity Diagrams

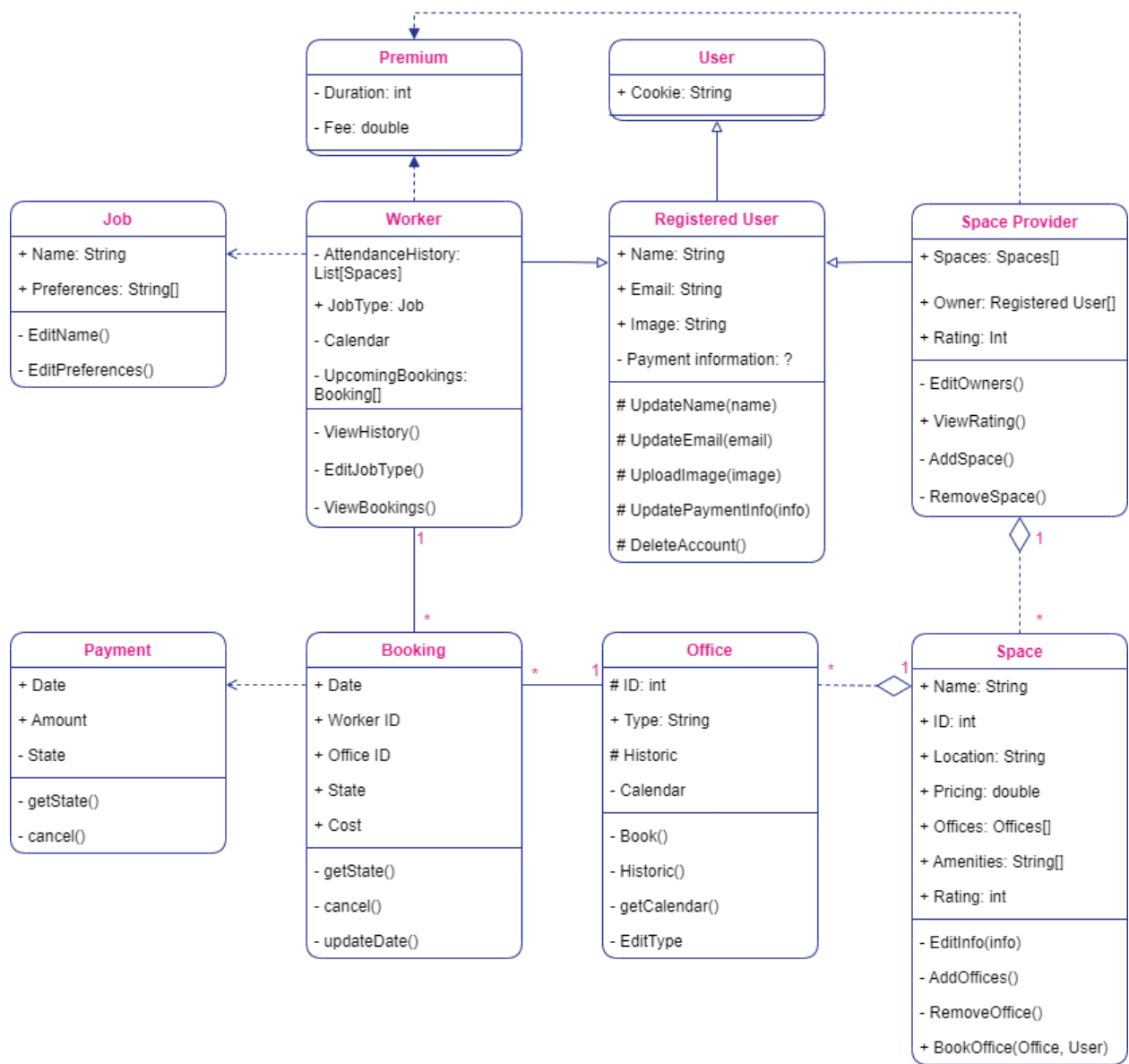Picture 1 - Activity Diagram of the search and booking of a Coworking Space.
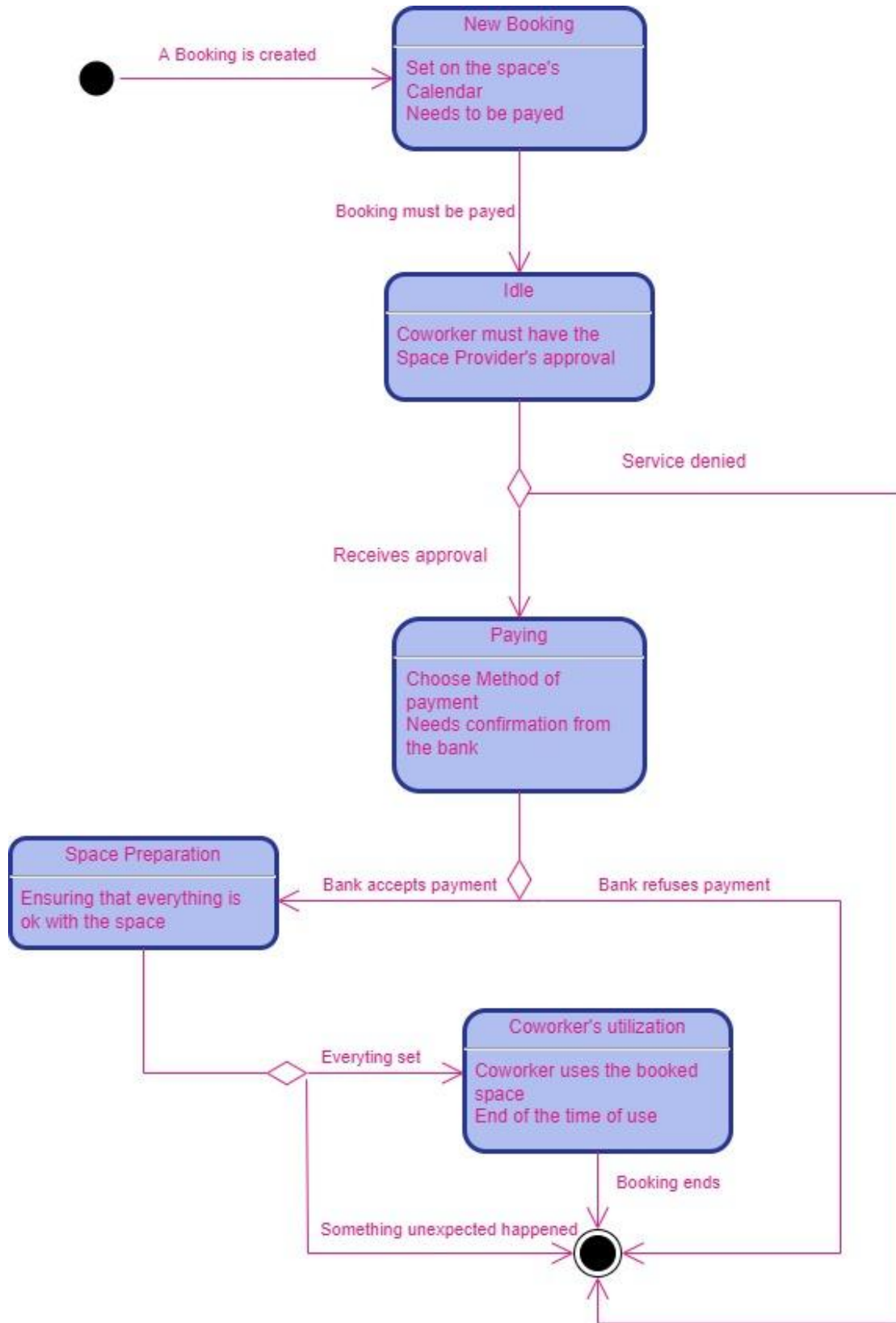
Picture 2 - Activity Diagram of the process of adding a Space by a Provider.

Picture 3 - Use Case Diagram of the main processes taking place in CoworkClub and their respective actors.

Picture 4 - Class Diagram of the main classes and respective attributes and methods.

Picture 5 - State diagram of the booking entity during a booking process.