Title: **Diving club - UML Modelling and User Centered Design Assignment**

Course: **Computer science**

Module: **Requirements Analysis and UCD**

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Date: **12/May/2022**

Table of Contents

Introduction

This report consists of two parts.

The first part outlines the requirements analysis methods used to gather user requirements for a web application for a diving club located by the Adriatic Sea. I have achieved this by interviewing stakeholders and querying them on their roles and responsibilities, as well as creating visual representations of client requirements. I have recognised their role in the business through collecting user stories and producing use case diagrams to help produce use case descriptions and activity diagrams.

The second part of this report outlines the design prototypes produced for the software interface that all stakeholders will interact with.

Aims and objectives

This project aims to effectively collect user requirements to aid in producing a software prototype of a web application. The web application will keep a consistent theme and have easy navigation system. It will also detect log in information and verify registration using 2FA.

1. PART 1

1.1 Stakeholder Identification Table (Lemac, ML. (template) 2022)

Stakeholder	Role/Responsibility	Importance	Influence	Interests/positive impacts	Concerns
Diving instructor	The diving instructor will have some interaction with the web application, this is to create and edit their bespoke profiles. This will allow visitors to pick the instructor in which they have the most confidence.	Diving instructors have relatively **low** importance regarding interaction. This is due to their lack of ability to view and confirm health forms and to set specific pricing.	**Medium**. Diving instructors are decision-makers to the extent that they can provide unique selling points in their profile such as previous qualifications to improve visitor confidence	The ability to create unique profiles encourages competition between instructors, this can also better guide management on instructor's performance	
Club leader	The club leader will have regular interaction with the system, this is to allow them to write and maintain information regarding the club. The club leader is also able to create and edit club information. i.e. change location/time/cost or delete existing trips. They also have a high responsibility in checking and approving health forms	Club leaders have **high** importance when identifying business requirements. This is due to their previous experience which allows them to make decisions which impact club and trip information	**High**, Club leaders are in the middle level of operation and can make vital decisions such as approving health checks and editing club and trip information.	Club leaders' increased responsibility such as approving health forms and creating new trips has a high impact on the business, for example, the presentation of posts can impact customer's outlook on their service.	Club leaders may require visitor contact information in case of disapprove-d health forms to allow them to contact customers for further information.

Manager	Managers will have occasional interaction with the system, this is to view financial reports and reviews related to their trips	Managers have relatively **low** importance when identifying business requirements as they are responsible for ensuring consistency and customer service	Managers have **medium** influence, this is because they are responsible for ensuring positive feedback. However, they have low interaction with visitors	Managers have a positive impact on customer service and have a high interest in customer outlook	Managers may want to overview trips
Owner	The club owner will have minimal interaction with the system. It will allow the club owner to view data on popularity of trips for future strategies, as well as view financial reports	The owner has **high** importance as they are responsible for maintaining financials and identifying strategies	Owner has low influence, as they are distant from managing and maintaining business requirements and their increased attention to financials.	Owner has a high interest in financials, business growth and strategy	

Figure 1: Stakeholder identification table

1.2 Stakeholder Onion Diagram

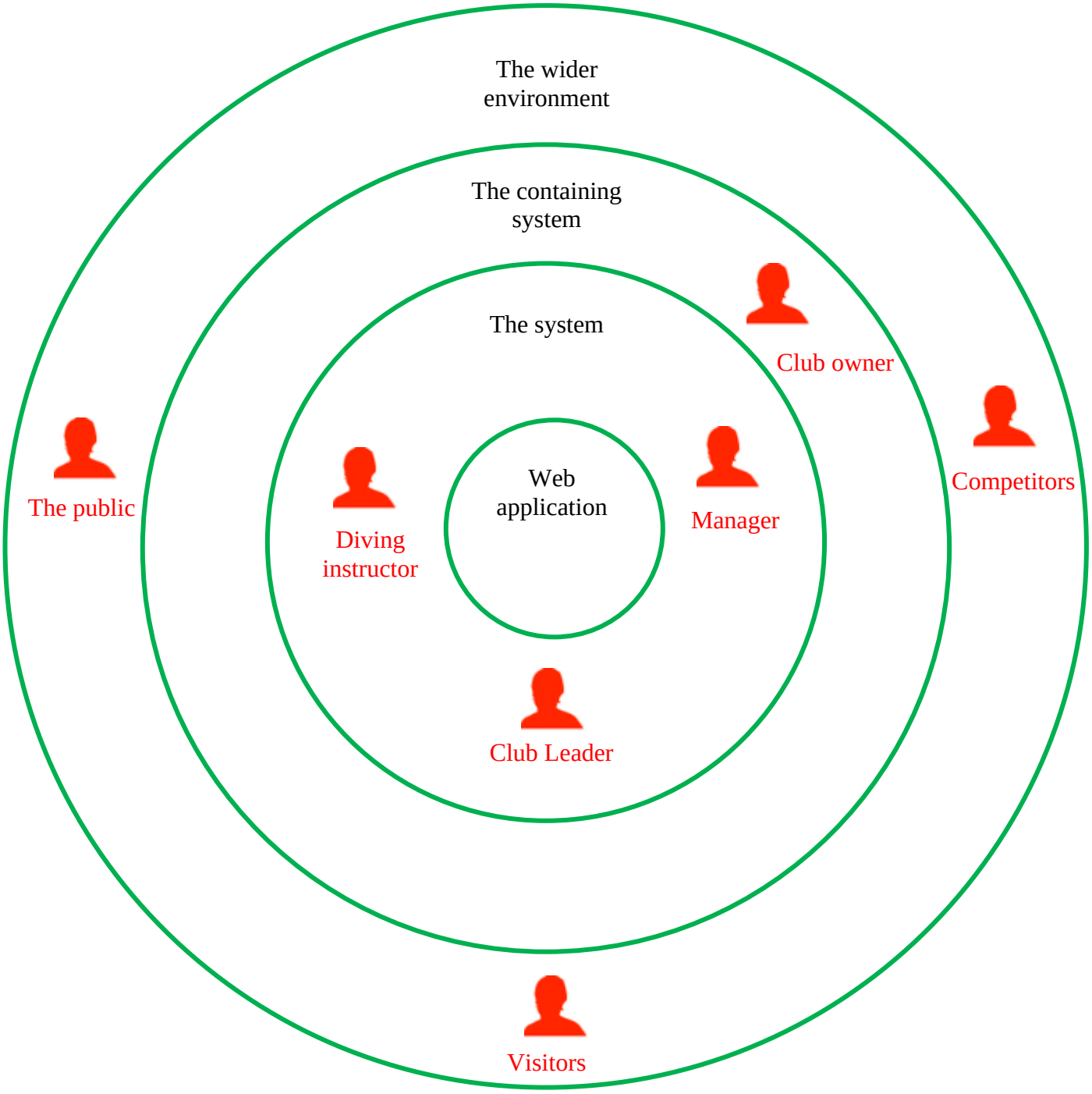

Figure 2: Stakeholder onion diagram

The onion diagram above, shows a combination of external and internal stakeholders based on their roles. The most inner circle represents the product being produced , and the second circle shows all stakeholders who will have operational interaction within the system, this includes diving instructors, managers, and club leaders. The containing system represents high-level management, in this case, there is only one owner. The wider environment shows stakeholders who may not interact with the system are impacted by it. This includes all potential visitors, competitors and the public.

1.3 User stories

View club info

As a visitor, I want to be able to view information regarding the club so that I can determine this is the club for me

View trips

As a visitor, I want to be able to view trips, so that I can decide what trip is best suited for me

View profile

As a visitor, I want to be able to view profiles of diving instructors to allow me to pick the best instructor for me

Create profile

As a diving instructor I want to be able to make my own profile so that I can promote myself to potential visitors

Register

As a visitor I want to be able to register an account so that I can book trips and make payments

As a staff member I want to be able to register my account so that I can get special permissions

Edit club info

As a club leader I want to be able to write and maintain formation about the club, so that it can entice potential visitors to the club

Create/edit trips

As a club leader I want to be able to create new trips as well as edit existing trips, such as date/time, type of boat, cost and instruction, so that customers are kept up to date in case of any changes

Submit health form

As a visitor I want to be able to submit health forms so that they can be approved by club leaders to ensure my health condition is appropriate

View financial reports

As the manager I want to view financial reports so that I can track financial progress for the club owner

As the owner I want access to financial reports so that I can keep track of profits to maintain shareholder confidence

View health form

As a club leader I want to view health forms so that I can approve visitors health condition

View trip reviews

As the manager I want to be able to view reviews for individual trips so that I can check if there are any issues that visitors are having.

View trip sales

As the club owner I want to know which trips are popular so that I can plan a future strategy

View reports	Book trip	Review trip
As the manager I want to be able to view trip reports so that I can keep track of current trips we are running	As a visitor I want to be able to book a trip so that the club can expect me	As a visitor I want to be able to review trips so that I can inform others, as well as provide constructive feedback to the club

Figure 3: User stories

1.4 Use Case Diagram for each user

1.4.1 Use case diagram for visitors

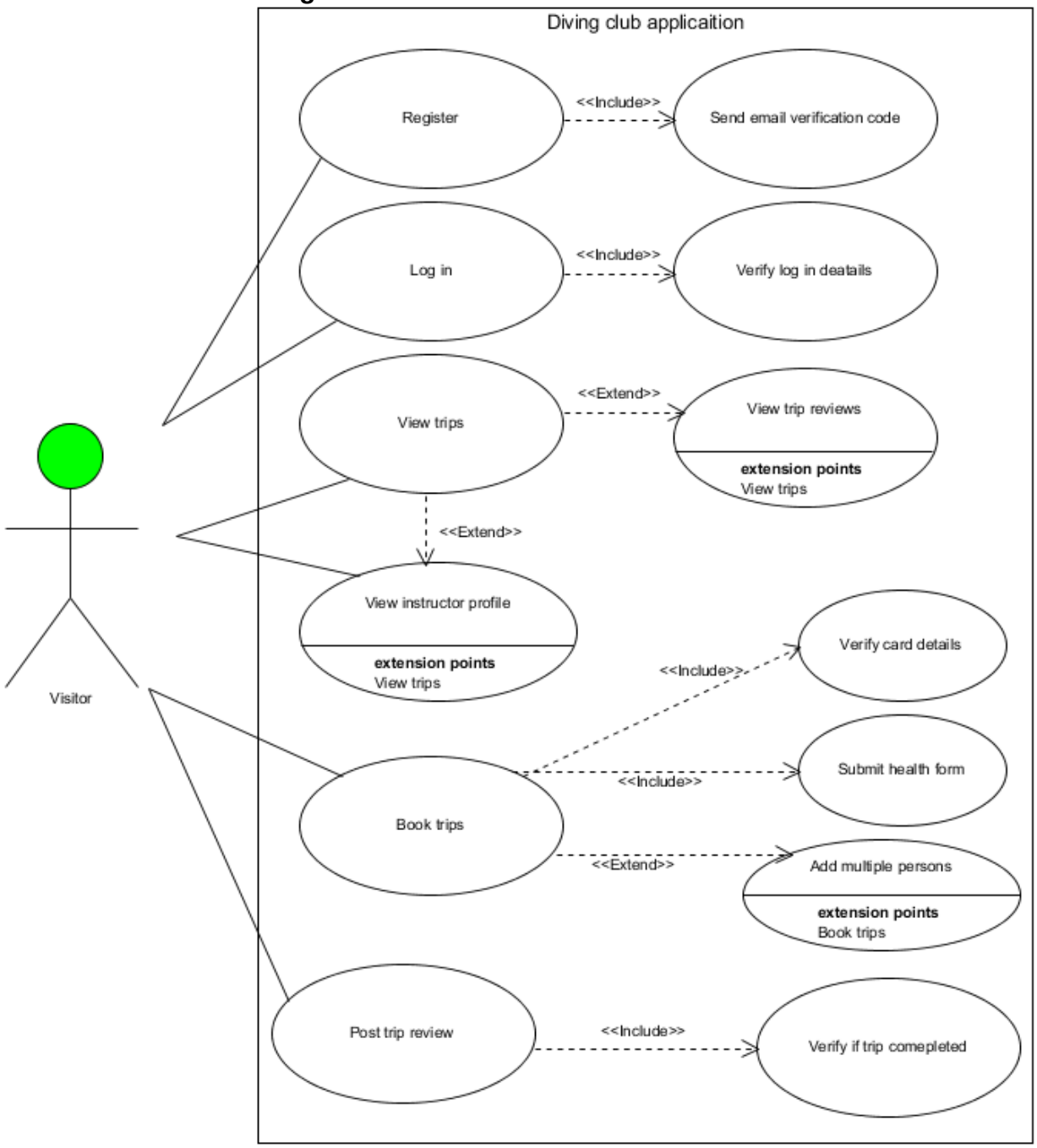

Figure 4: Use case diagram (visitor)

The visitor use case diagram is shown above. The following use cases have been identified; register, log in, view trips, view instructor profile, book trips, and post trip reviews. During registration, the user will have to verify that the email being used is theirs. This is to prevent spam accounts and can be verified using a 2FA email code. If the user wishes to log back into their account, the system will reverify login details. While browsing trips, the user can view the associated diving instructor's profile, this is to aid decision making for the user. Once the visitor has determined which trip they want to take, the booking process will involve verification of payment, submission of a health form and an option to add multiple members

1.4.2 Use case diagram for instructor

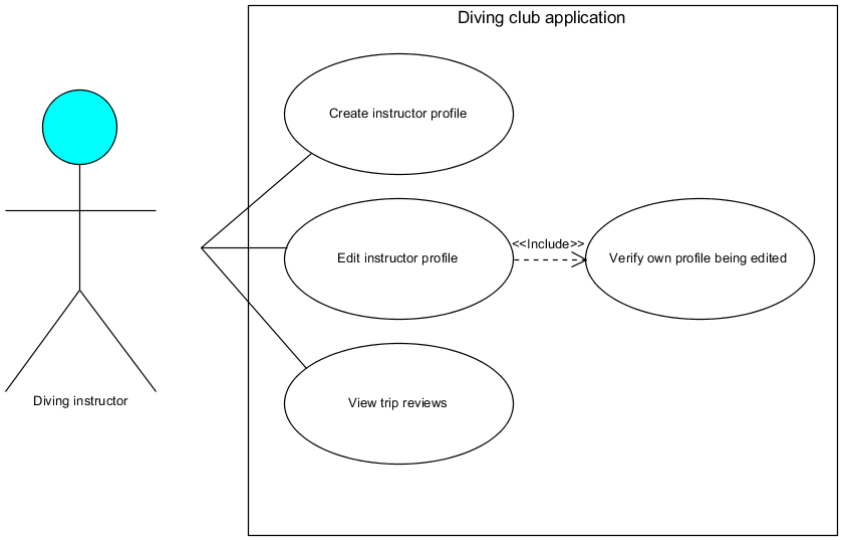

Figure 5: Use case diagram (diving instructor)

The use case diagram above, shows the following use cases; Create instructor profile, edit instructor profile and view trip reviews. If the instructor wishes to edit their profile, the system will re-verify their log in details

1.4.3 Use case diagram for club leader

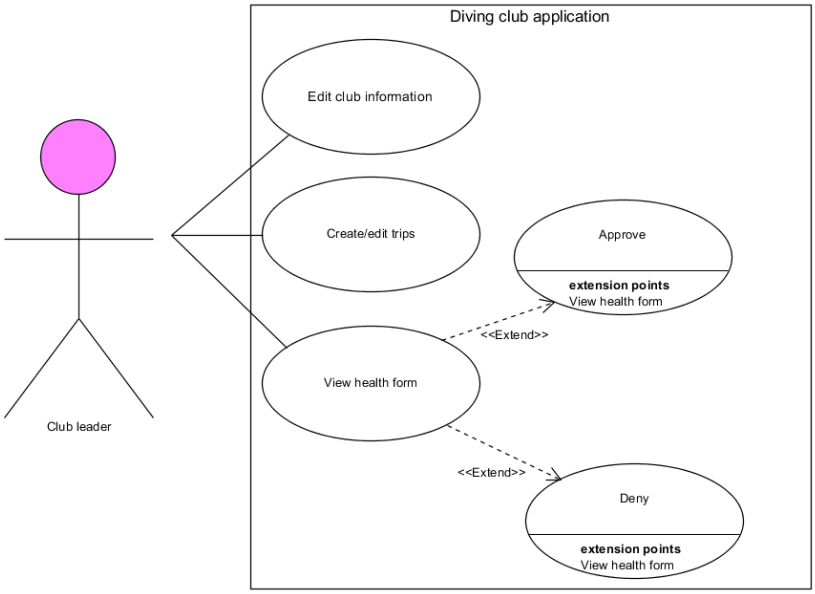

Figure 6: Use case diagram (Club leader)

A use case diagram for the club leader is shown above. The club leader can; edit club information, create/edit trips as well as the ability view and approve/deny health forms.

1.4.4 Use case diagram for manager

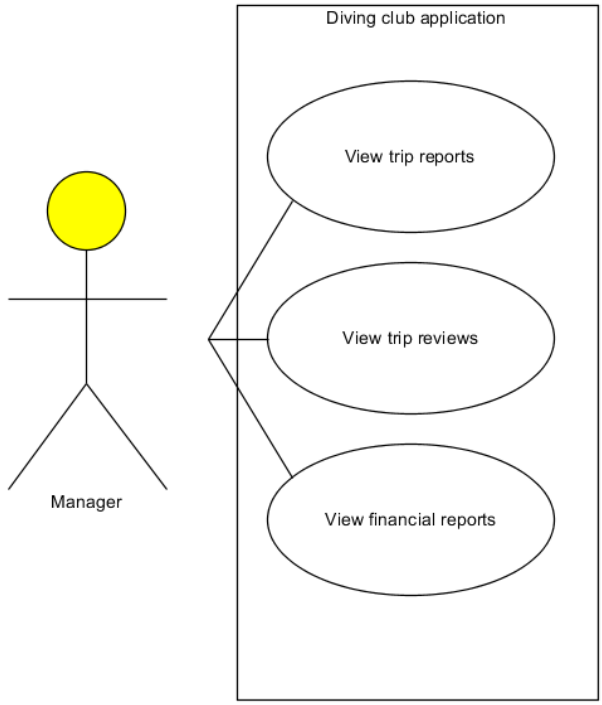

Figure 7: Use case diagram (Manager)

The use case diagram above, shows that the manager has special permissions to view trip and financial reports. They also can view trip reviews to better improve customer service.

1.4.5 Use case diagram for owner

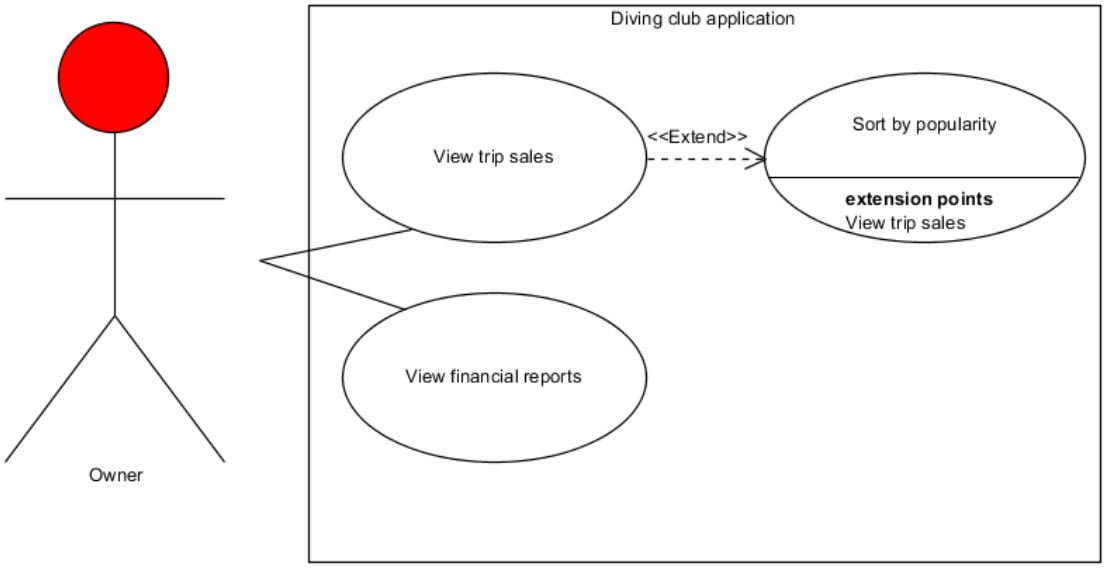

Figure 8: Use case diagram (Owner)

The owner use case diagram above, shows that the owner can view trip sales and sort trips by popularity. They can also view financial reports.

1.5 Use case description for “book trip”

Use case name:	Book trip	
Scenario:	Diving club	
Triggering event:	The customer has decided to book a trip with their preferred instructor.	
Brief description:	The customer books the trip and completes a health form that is then sent to the club leader for verification.	
Actors:	Customer, Club leader	
Related use cases:	Verify payment Submit health form Add multiple persons	
Stakeholders:	Visitors, diving instructor, club leader, manager, owner	
Preconditions:	The system must be available Trip must exist Trip must have available spaces Payment must be verified	
Postconditions:	The health form must be approved by the club leader Booking recorded for sales and financial reports A customer account will be registered to the system, if its the first time	
Flow of activities:	**Actor**	**System**
	1. Visitor shows interest in booking a trip	1.1. System will provide information about the trip to visitor
	2. Visitor progresses with booking the trip,	2.1. System will provide a form for visitor details 2.2. System will provide a health form to ensure health condition is appropriate
	3. The customer pays and books the trip	3.1. System will register customer to system if first time booking

		3.2. System will update available spaces for trip 3.3. System will send booking confirmation to visitor 3.4. System will send health form to club leader for approval
	4. Club leader approves/denies visitor health form	4.1. System will send an email to visitor indicating health form approval/denial
Exception conditions:	Declined card payment Incomplete health form Incomplete visitor details	

Figure 9: Use case description – Book trip

1.6 Use case description for “view trips”

Use case name:	View trips	
Scenario:	Diving club	
Triggering event:	Potential visitor wishes to browse trips they might be interested in	
Brief description:	The customer wishes to make the best decision on which trip is best for them, while taking in to account the instructor associated and their profile	
Actors:	Visitor, diving instructor	
Related use cases:	View trip information, view trip reviews, view instructor profile	
Stakeholders:	Potential visitor, visitor, diving instructor, competition,	
Preconditions:	System must be available Trip must be for future, not past Visitor must have internet access Trip must exist An instructor must be associated with trip	
Postconditions:	Trip page view counter incremented for stats	
Flow of activities:	**Actor**	**System**
	1. A potential visitor visits the website 2. They browse available trips	1.1. System will output an appropriate interface for the potential customer to interact with for browsing purposes 2.1 System will show all available trips 2.2 System will show the instructor associated with relevant trip.
Exception conditions:	Disconnection of internet	

Figure 10: Use case description – Browse trip

1.7 Activity diagram for “book trip

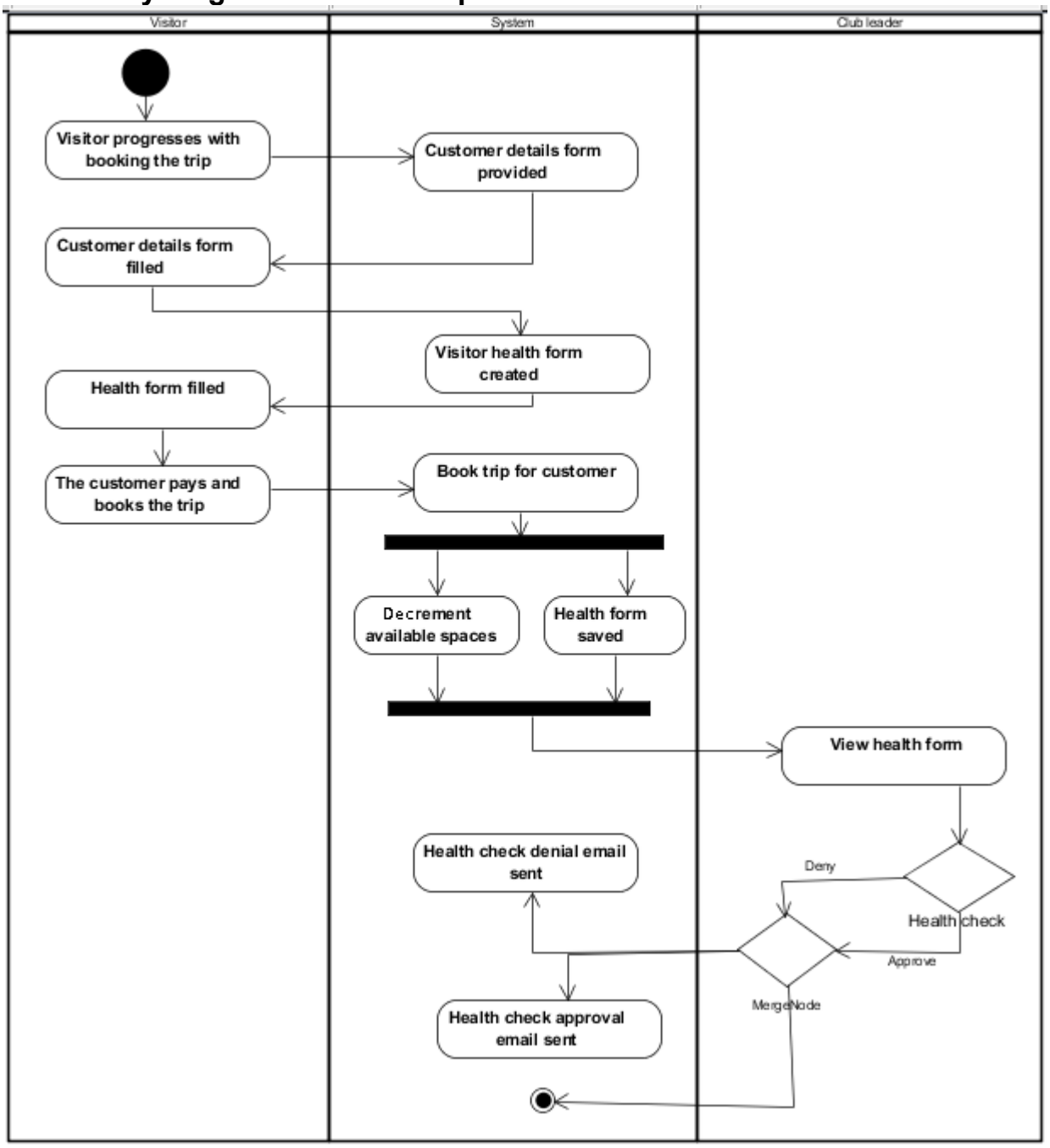

Figure 11: Activity diagram – Book trip

The diagram above, shows the activity diagram for the use case description for booking a trip. The initial node is followed by the visitor starting to book the trip, the process continues until all steps (i.e., health forms) are completed. The diagram shows a fork node to show that once the system registers a booking, it will simultaneously decrease available spaces and save the health form provided by the visitor so it can be sent to the club leader. The decision node is shown in the club leaders’ swim lane as they will approve/deny health forms, the system will then react accordingly.

1.8 Activity diagram for “view trip”

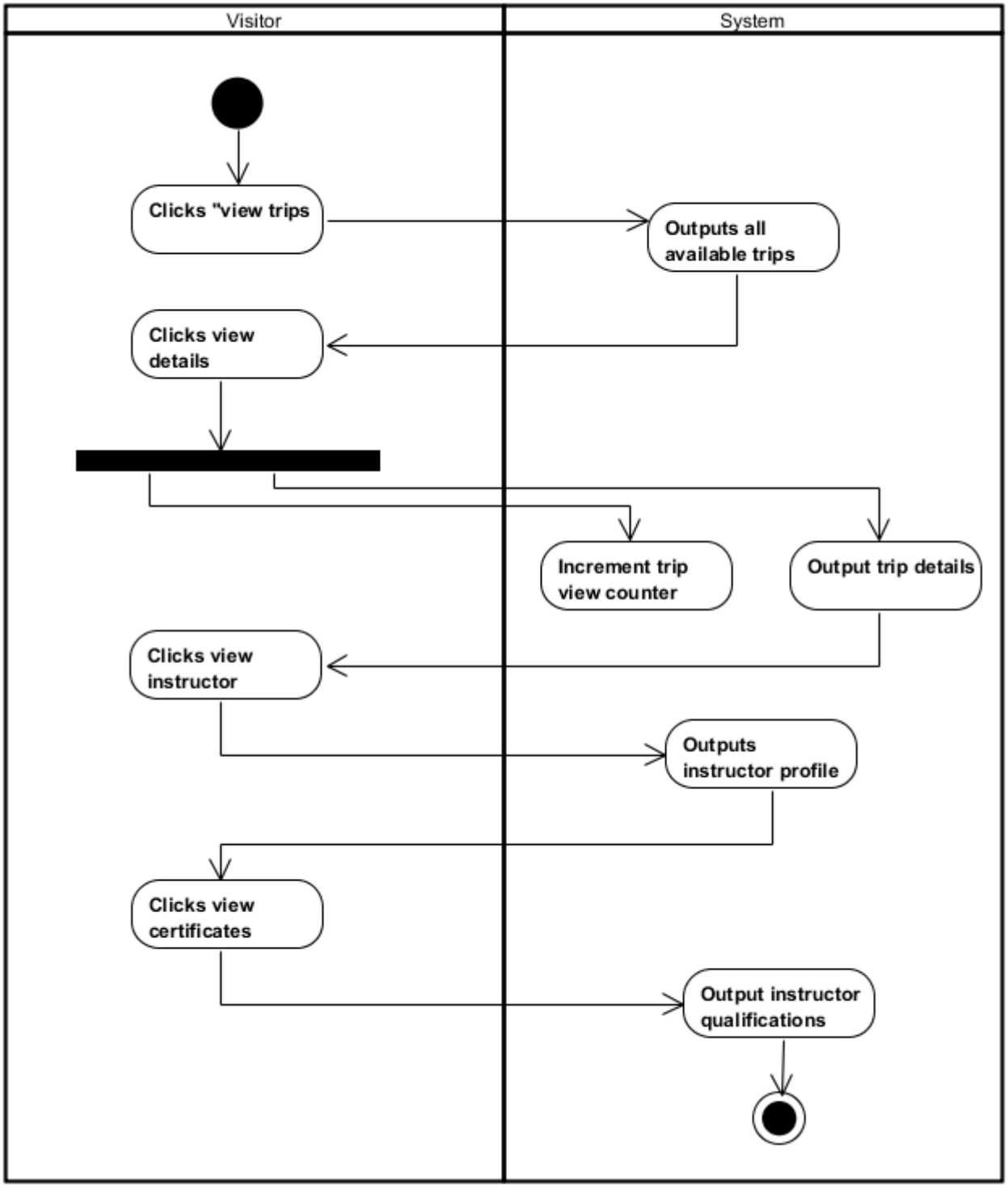

Figure 12**:** Activity diagram – Browse trip

The activity diagram above, shows the flow of activities for a potential visitor who browses the website. If the customer clicks on a trip. This process will simultaneously record that a trip has been viewed so that the owner can devise future strategies and, the system will output trip details. Once on the trip page, the visitor will have the option to view the instructor’s profile to better aid their decision making on what trip is best suited for them.

1.9 Domain Class Diagram

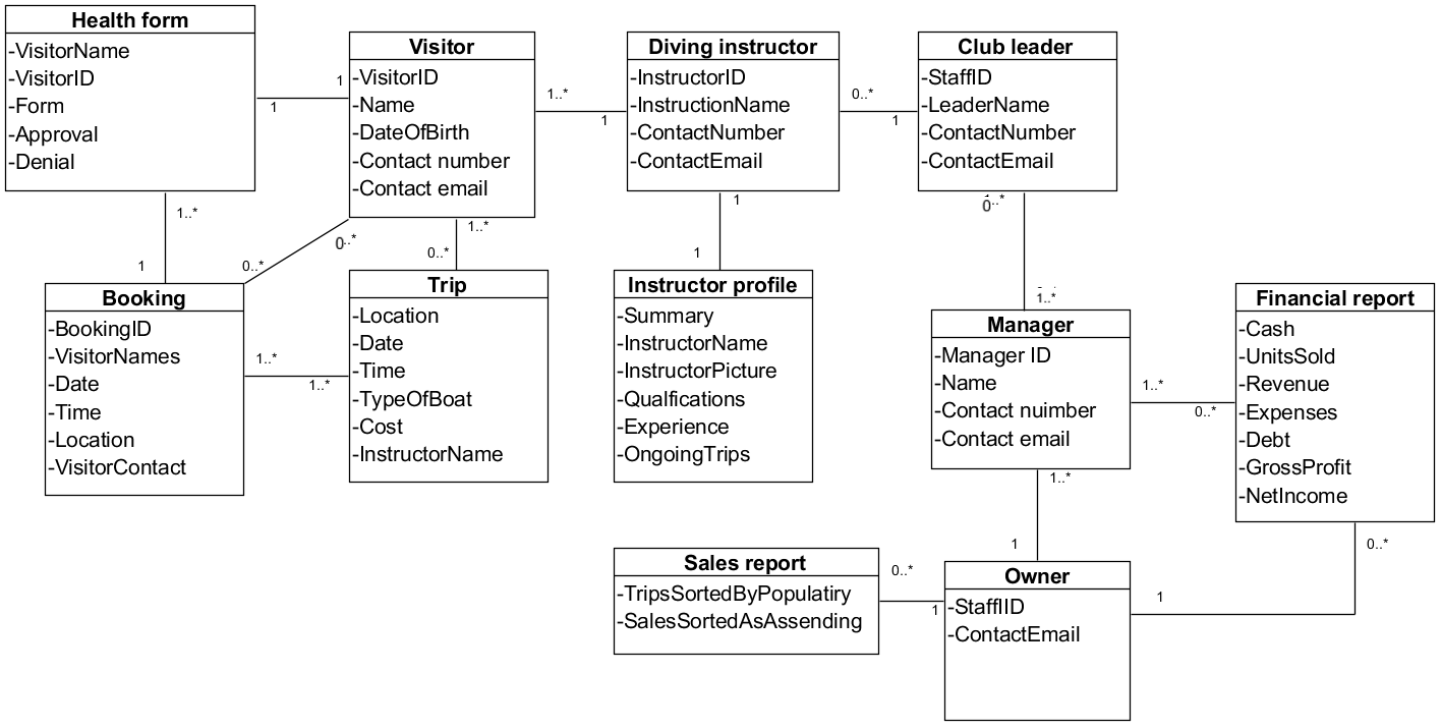

Figure 13: Domain class diagram for diving club

The domain class diagram above, shows classes and their attributes. The relationships identified are; 1 health form **to** 1 visitor, 1 or more health forms **to** 1 booking, 1 or more bookings **to** 1 or more trips, 0 or more bookings **to** zero or more visitors, 1 diving instructor **to** 1 or more visitors, 1 diving instructor **to** 1 instructor profile, 0 or more diving instructors **to** 1 or more club leader, 1 or more manager **to** 0 or more club leaders, 0 or more financial reports **to** 1 or more managers, 1 owner **to** 1 or more managers, 1 owner **to** 0 or more financial reports, 1 owner **to** 0 or more sales report.

2. Part 2

Wireframes

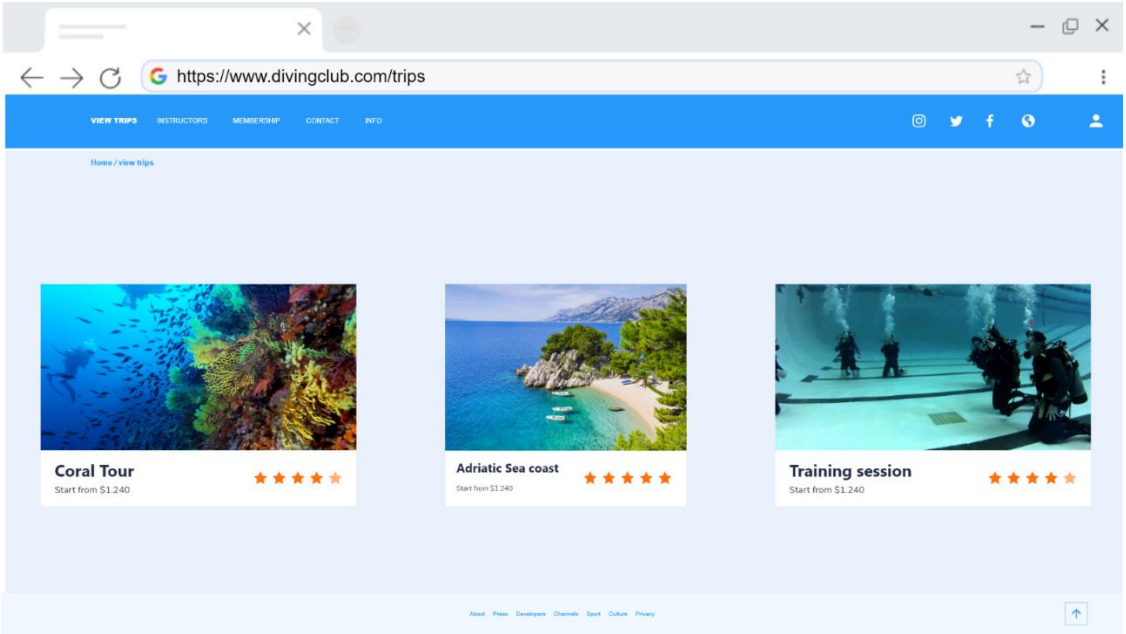

Figure 14: Wireframe for viewing trips

The wireframe above for viewing trips shows the interaction a potential visitor will have when they first load the website. The user can view available trips and their reviews. The visitor can click on a specific trip and view details regarding the trip. I have avoided the use of a hamburger navigation system as not all users will be familiar with it.

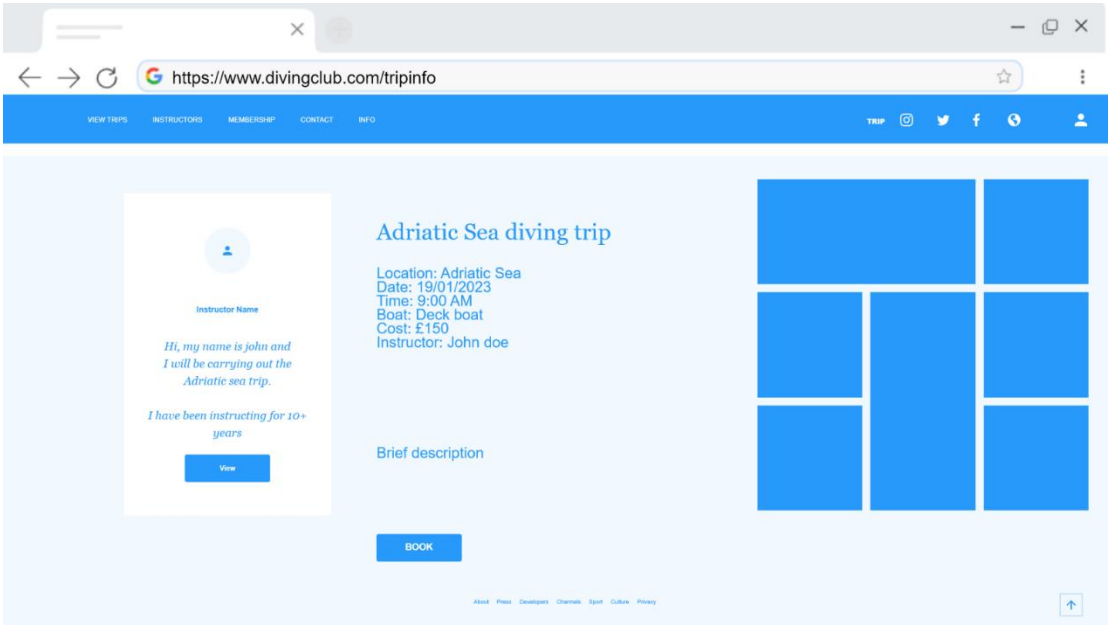

Figure 15: Trip details

The wireframe for trip details is shown above. Once the user clicks on a specific trip, the system will provide the details associated with that trip. The visitor can also view the profile of the specific instructor assigned to the specific trip. The visitor can also view images previously taken of the trip. They then have

the option to book the trip, which will direct them to a form where they will be required to fill out personal details and also a health form

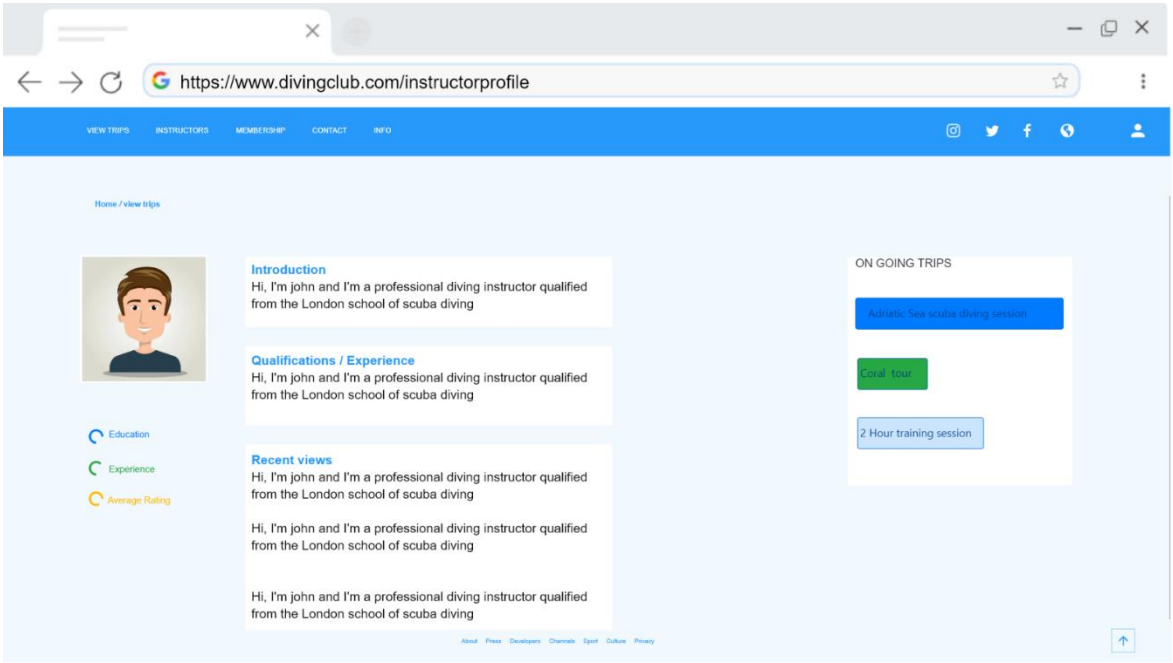

Figure 16: Wireframe for Instructor profile

If the visitor wishes to view an instructor's profile, either directly or through the trip page, the system will provide the visitor with details of the instructor (see above). This includes a picture, qualifications and a summary. The system will also show what trips the instructor is currently assigned to. This addresses the requirement from visitors regarding decision making on what instructor is best for them .

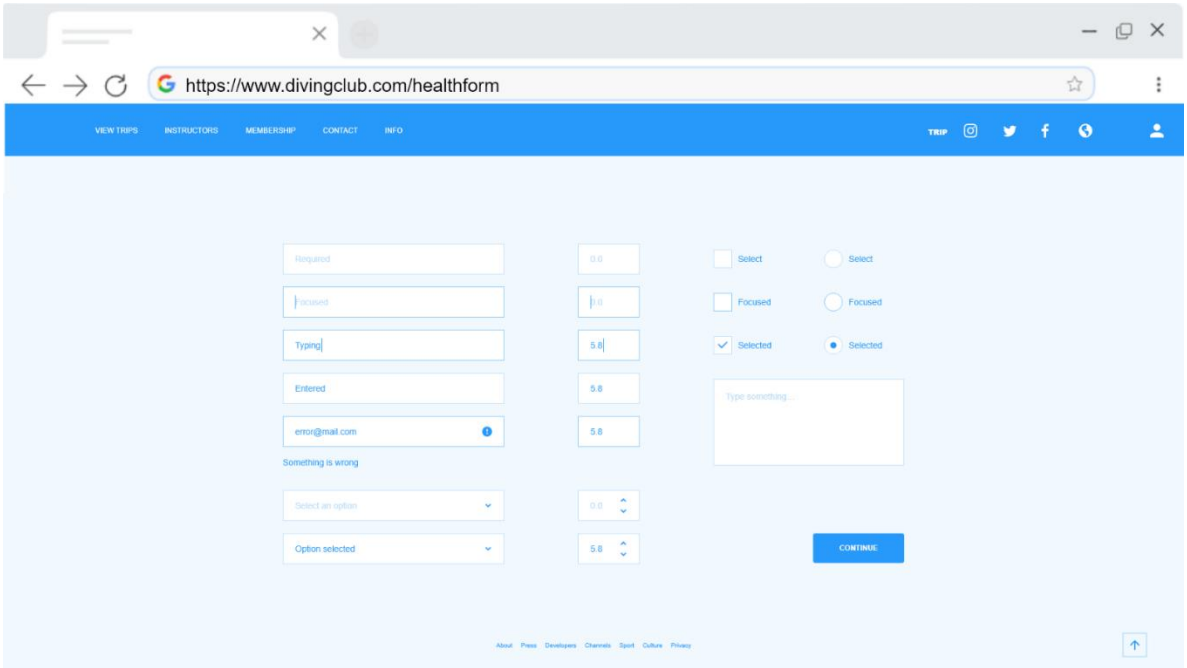

Figure 17: Wireframe for health form

Once the visitor decides they want to book a trip and have filled out their personal details, they will be provided with a health form (see above). This is done so club leaders can ensure visitors' health condition is appropriate. The system will send the form to a club leader once payment has been completed.

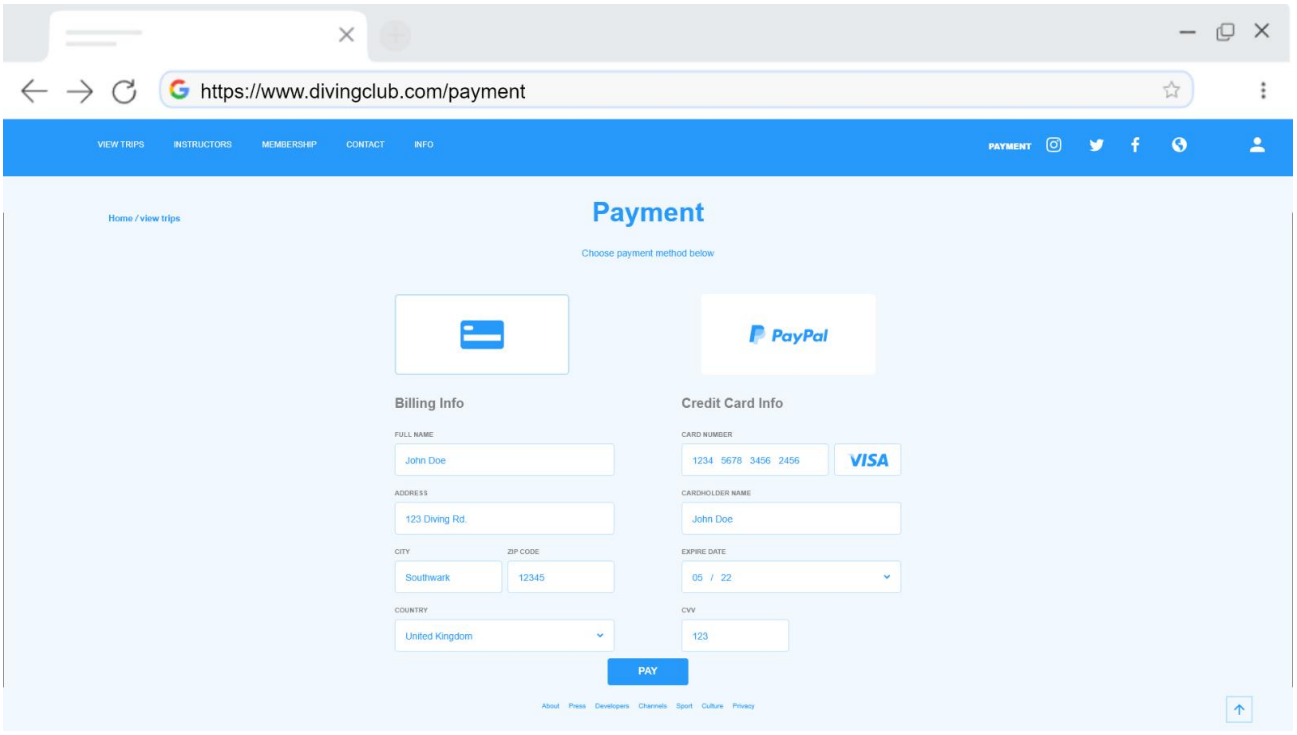

Figure 18: Wireframe for payment page

Once the visitor has completed their health form and clicks continue, the system will provide a payment page (see above), where customer can pay with either a payment card or PayPal. The card details will be verified before the system completes this use case.

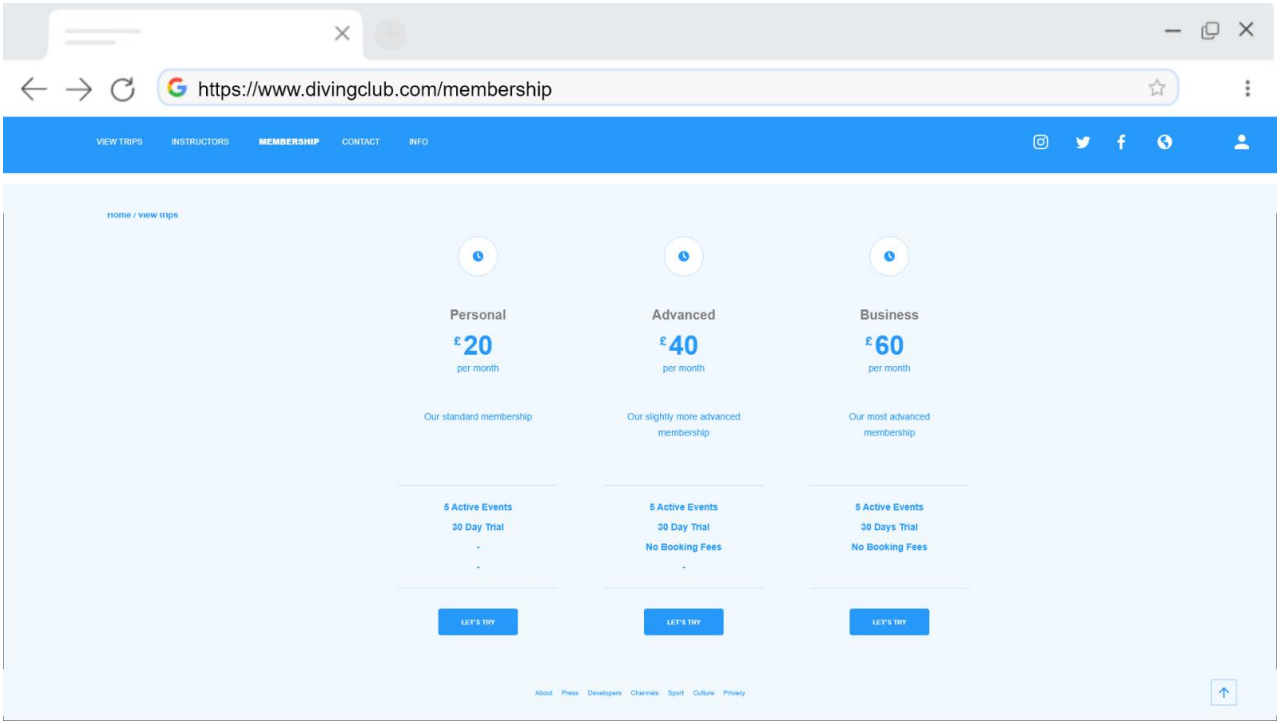

Figure 19: Wireframe for membership page

Through the simple navigation bar, the visitor can also pay for memberships. This will give them access to trips for free. The visitor can click “let’s try” and will be directed to the payment page (see fig 18).

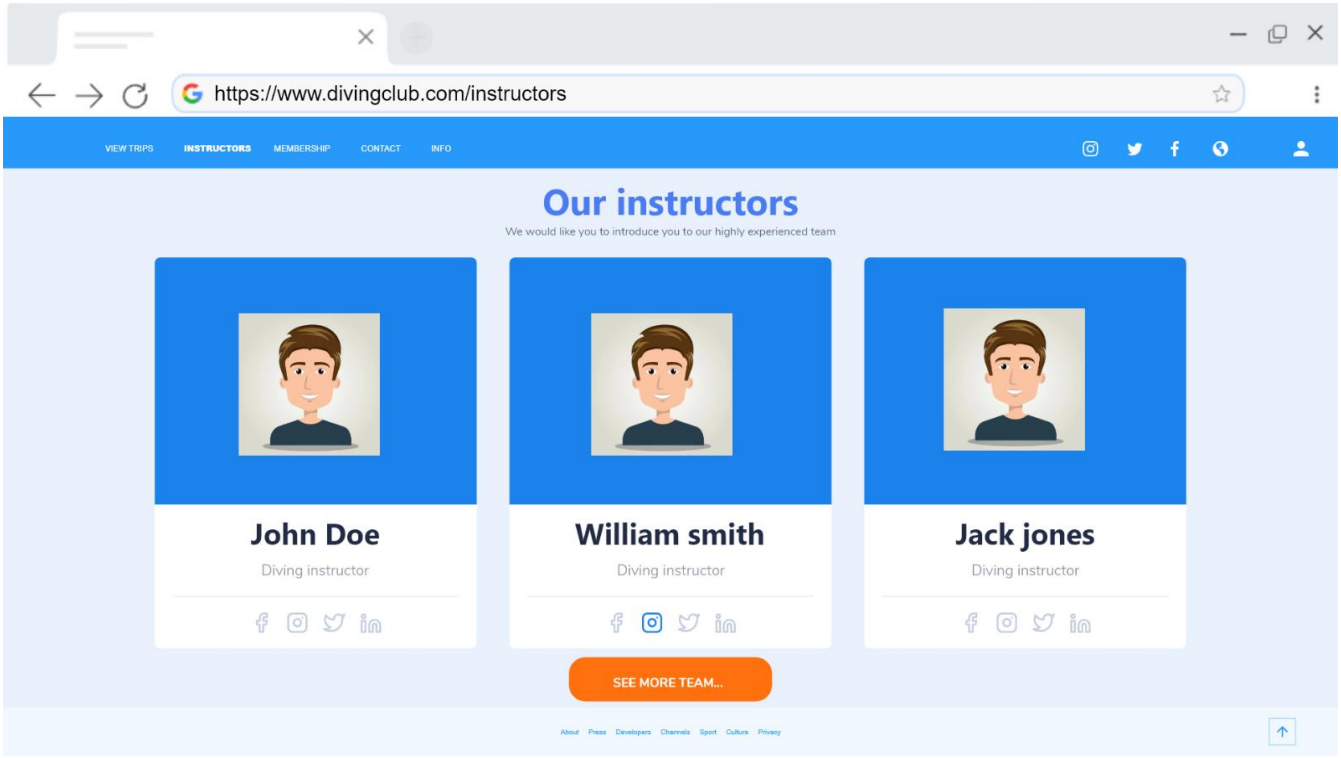

Figure 20: Wireframe to browse instructor’s page

Through the navigfation menu, users can directly access all instructors employed by the club. They can also click on the instructors box to go to their profile page.

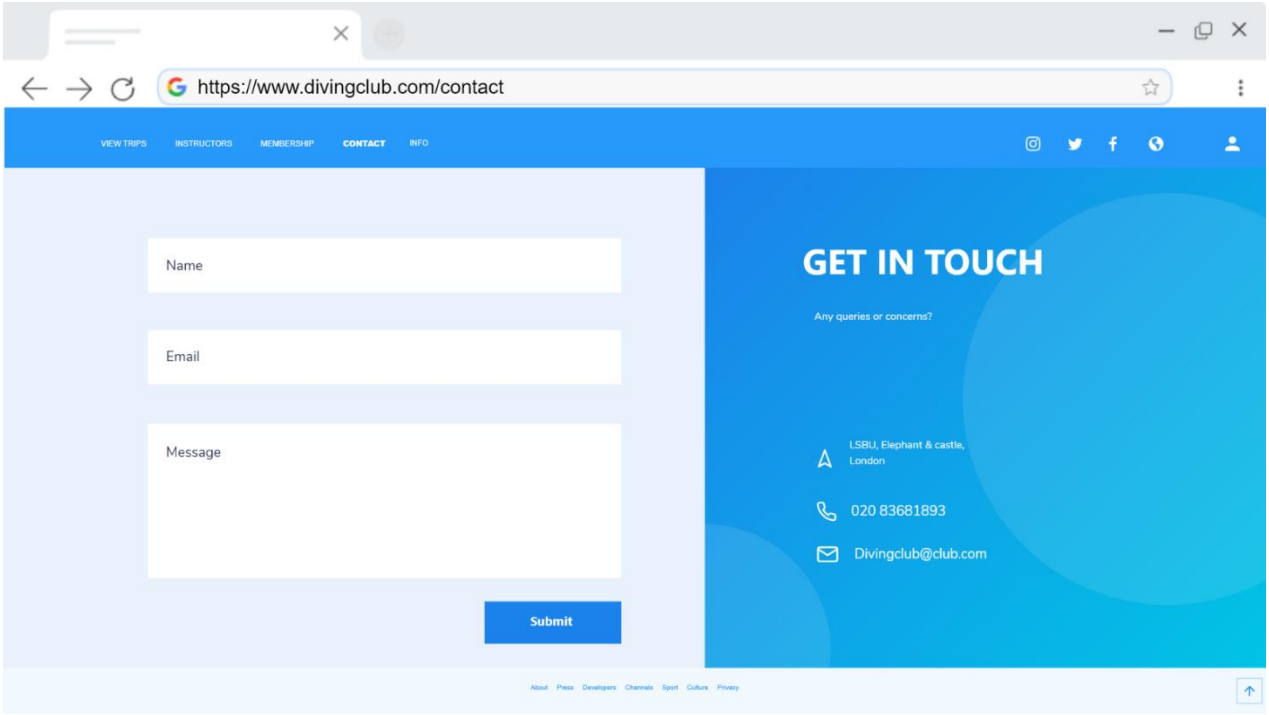

Figure 21: Wireframe for contact page

The customer can directly access the contact page through the navigation bar. The system will provide a form and an email address/contact number.

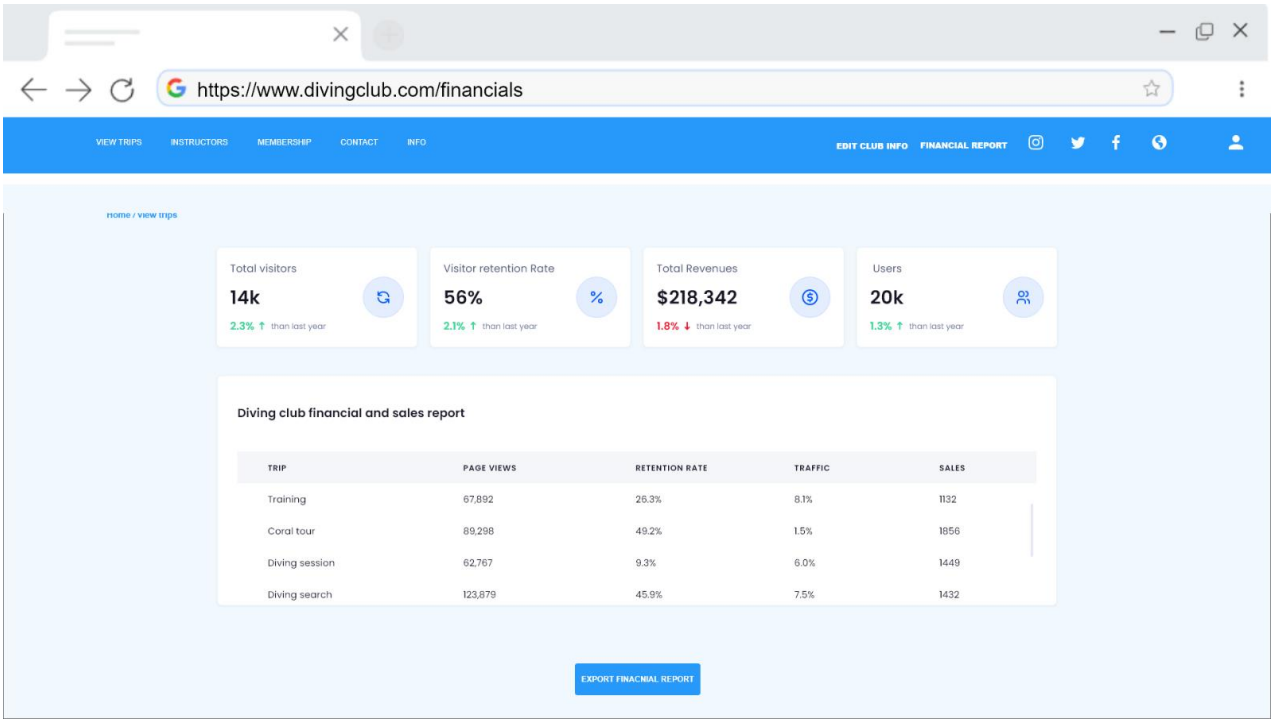

Figure 22: Wireframe of financials for owner

The financials wireframe above shows the financial dashboard produced for the owner. The owner can view revenues as well as sort trips by popularity. They can also export financial reports to CSV.

Conclusion

The UML part of this report was significant in identifying business requirements. The onion diagram and stakeholder table were vital in better understanding stakeholder roles and responsibilities. They also helped identify concerns which may halt development. The use case diagram was significant in identifying use cases for specific users, this helped further identify special permissions that users may require, for example, financial reports for the owner. I have also used use case descriptions, this was to identify states the system may have to be in, and to plan out a common flow of activities that may be followed. The use case diagram helped to efficiently produce an activity diagram, which through the use of fork/join nodes and decision diamonds we can identify concurrent processes and conditionals. The domain class diagram was necessary as we need to identify relationships between users and objects to better understand how interaction will occur within the system. The second part of this report outlined the wireframes produced from the requirements identified in part 1 (UML). To ensure consistency I maintained a blue and white theme, this is due to their ease on the eye, I also avoided using a hamburger menu (3 lines) as not all users will know how to interact with it and it could cause interactivity barriers. Overall I believe UML was extremely vital on expanding on the case study which allowed for a much more efficient design process and

a more sensible navigation system. However, I believe prototyping in wireframes is necessary as it can further identify ambiguities within the requirements.

References

[1] Lemac, ML. (2022) *Use Case Descriptions – Template* [Requirements Analysis and UCD, CSI-4-RAU]. London South bank university, Week 4.

[2] Lemac, ML. (2022) *Stakeholder (Onion Template)* [Requirements Analysis and UCD, CSI-4-RAU]. London South bank university, Week 5.

[3] Visual Paradigm International Ltd. 2010. *Visual paradigm* (20220503). [Software]. [01/04/2022].

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Table of figures

UML

WIREFRAMES

Appendix
Case study

Requirements Analysis and UCD Assignment
Assignment Scenario: Diving Club

The scenario includes the information and the level of detail that is expected from the initial stage of the requirement gathering process. For this reason, make any assumptions deemed necessary to make the system under study more complete. This would mean filling the gaps rather than adding more requirements.

A small scuba diving club has decided to make some income by organising diving trips for tourists. They are based in a small coastal town by the Adriatic Sea. All the club divers are qualified diving instructors.

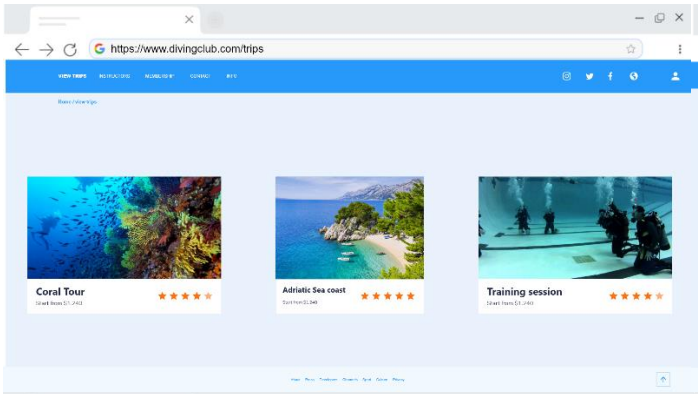
The club requires a web application, which will enable the visitors to read about the club, the trips they organise and the diving instructors' profiles information. The diving instructors' profiles would be available for everyone to read. These would be created by the instructors and would contain information about their qualifications and experience related to scuba diving. The purpose of this is for the people who book their trips to have confidence in the diving instructors' abilities.

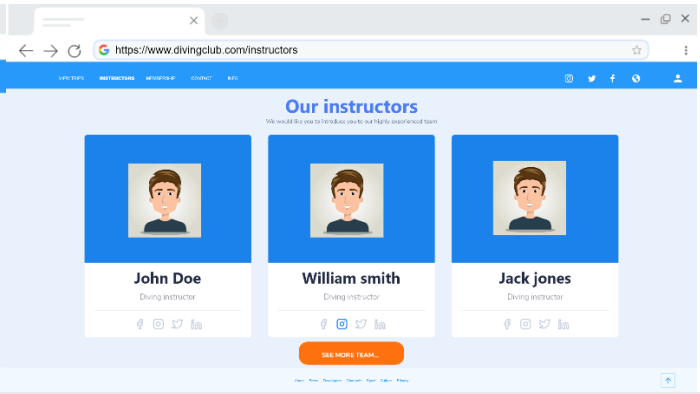
If the visitors would like to book a trip they would first need to register with the club. As registered users they should be able to do everything that casual visitors can do plus book trips and make required payments through the application. Once they book a trip they will be able to access the specific instructions related to their trip. A health check form is also part of this. They would need to fill it in and submit it for the club leader to view and approve. This is done to ensure that their health condition is appropriate for the trip and diving. After they have done the trip they will be able to review the trip.

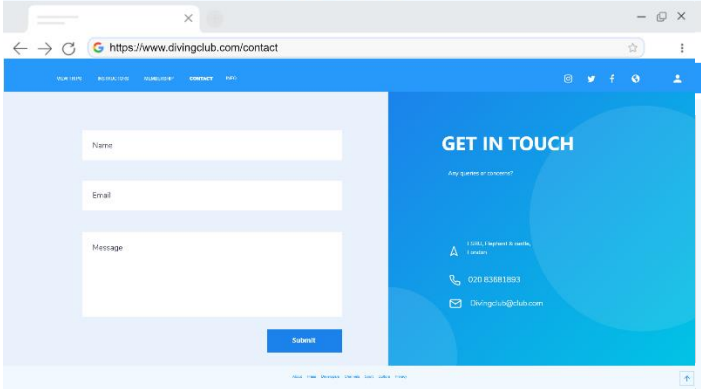
The club leader is responsible for writing and maintaining general information about the club. He/she would be able to post new or update /delete the existing trips. The information included for every trip is location which should also show on the map, date/time of the trip, type of a boat, cost and the instructor’s name. This is published for everyone to read, but only registered users can book.

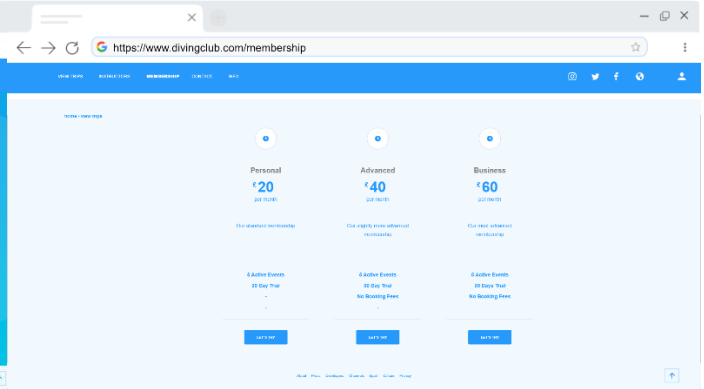
The manager also needs to view reports related to the booked trips. The payments will be processed through the application. The manager would like to also view the reviews to check if there are any issues with the trips. The owner of the club needs to know which trips are popular in order to devise and plan their future strategies. They are also interested in financial reports.

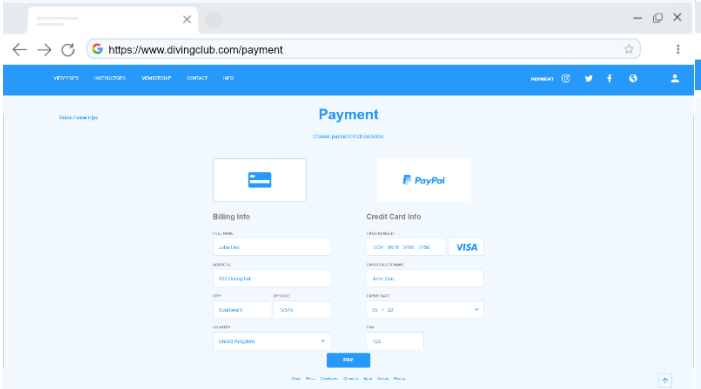
Wireframes

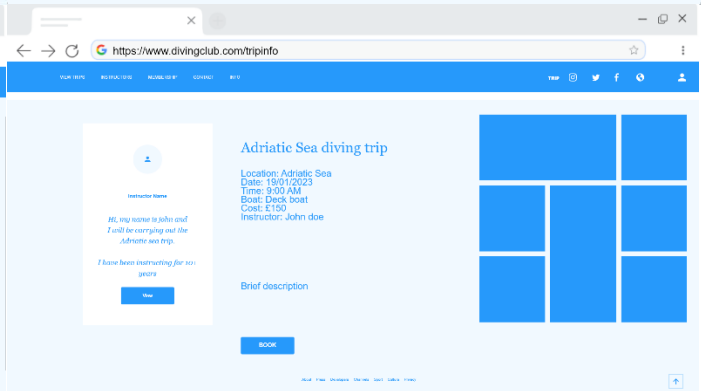

https://www.divingclub.com/trips
Coral Tour
Adriatic Sea coast
Training session

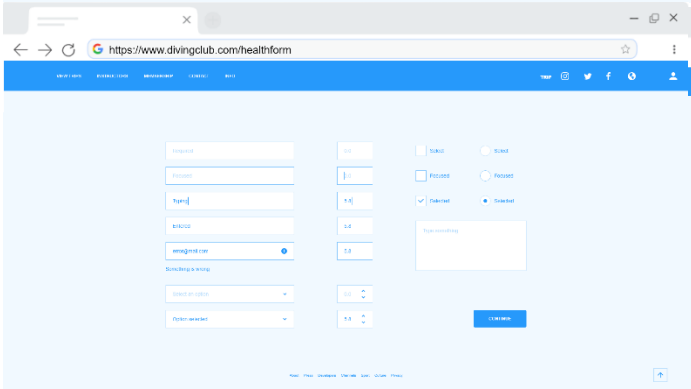

https://www.divingclub.com/instructors
Our instructors
John Doe
Diving instructor
William smith
Diving instructor
Jack jones
Diving instructor
SEE MORE TEAM...

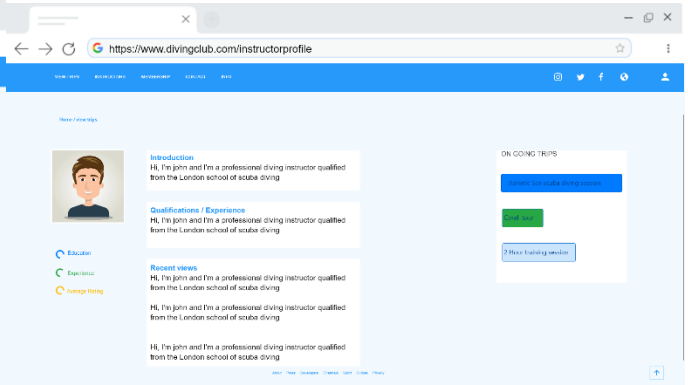

https://www.divingclub.com/contact
Name
Email
Message
Submit
GET IN TOUCH
020 83881893

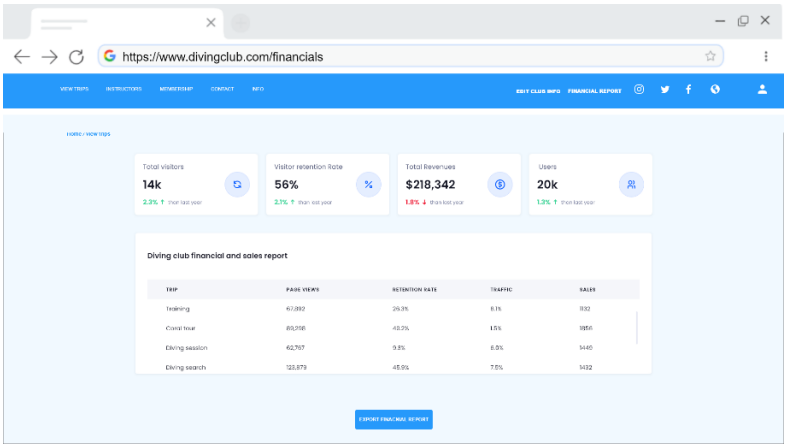

https://www.divingclub.com/membership
Personal
£20
Advanced
£40
Business
£60


https://www.divingclub.com/payment
Payment
PayPal
Billing Info
Credit Card Info
VISA


https://www.divingclub.com/tripinfo
Adriatic Sea diving trip
Location: Adriatic Sea
Date: 19/01/2023
Time: 9:00 AM
Boat: Deck boat
Cost: £150
Instructor: John doe
Brief description
BOOK


https://www.divingclub.com/healthform


https://www.divingclub.com/instructorprofile
Introduction
Qualifications / Experience
Recent views
ON GOING TRIPS


https://www.divingclub.com/financials
VIEW TRIPS
INSTRUCTORS
MEMBERSHIP
CONTACT
INFO
EDIT CLUB INFO
FINANCIAL REPORT
Total Visitors
14k
Visitor retention Rate
56%
Total Revenues
$218,342
Users
20k
Diving club financial and sales report
TRIP
PAGE VIEWS
RETENTION RATE
TRAFFIC
SALES
Training
Coral tour
Diving session
Diving search
EXPORT FINACIAL REPORT