HairHub

Technical Report

National College of Ireland

Bachelor of Science Honours Degree in Computing

Computing Project BSHCSDE

Academic Year 2022/2023

Tamara Diaz Brevers

0834617244

breversemail@gmail.com

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Executive Summary

The purpose of this document is to twist the market for the hair transplant online industry by centralize all the information in only one single space. Associate offer and demand with this approach, while at the same time protecting the user from fraudulent third parties.

This report outlines the purpose of creating a centralized website for the hair transplant industry, where clients can access information and hair transplant companies can submit offers. The main aim of the project is to simplify the process of finding information online about hair transplants and provide a safe environment for clients to find genuine hair transplant companies. The report highlights that currently, clients must search through multiple websites, and this process is time-consuming and complicated. The website will require companies to meet certain criteria to have an open profile, ensuring a safe environment for clients.

The report outlines the technology used, including Ruby on Rails, Heroku, Stripe, Google Maps API, and Twilio API. The report also includes a brief overview of the structure of the document. The system requirements include a website, registration system for clients and agencies, a platform for clients to submit their hair transplant request, a platform for agencies to submit offers to clients, and a payment system for purchase transactions. The report recommends the development of the centralized website to help clients find the best hair transplant offer and connect supply and demand in one place.

1.0 Introduction

1.1. Background

The hair transplant industry is in high demand [1] and one of the reasons could be because we are living in a moment where people take care of their health and their bodies more than ever before. One of the biggest issues that both the female and male populations have faced for hundreds of years is hair loss. The truth is that nowadays hair transplants are becoming the most popular solution to see ourselves with hair again.

At the moment there is a gap in the market, as clients have to do their own research on many different sites to find all the information, they need relating to hair transplants. The aim of my project is to create a website to act as a central source of information for people searching for information online about hair transplants. These clients can come to this site and register, creating their own individual profile. They can submit pictures and write a request for the type of treatment they are looking for. After that, companies can submit offers directly to that person, the client can then compare all those different offers coming from several companies and if the person decides to accept the offer on the site, it then turns into a purchase transaction.

So, I would like to twist how the market online is working a little bit and instead of the client spending time trying to figure out which is the best treatment for them and the best place to go (Turkey, Spain...) the companies can come to the website, create a profile and provide the client with different offers directly.

This is a much faster way to connect offer and demand in a single space.

1.2. Aims

The objective for this project is to twist the market for the hair transplant field. Nowadays it is really complicated to find information across the world for those who see themselves in need of doing a hair transplant. There is plenty of information online, but it is easy to fall into all kinds of fraud and scams. Especially when some of those websites are built in other languages, or when providing your bank details to proceed with the payments online and booking a service. It is always scary without any kind of coverage or insurance which can cover you in those kinds of scenarios.

It is a complex process and time consuming, if we take into consideration the amount of hours that we need to research accurately, to choose an appropriate place and to find the offer that adapts most to our needs. We need to take into consideration, good ratings to avoid scams, expenses not only in the hair transplant but also the trip to be able to travel to different locations and of course our health, we want to be in good hands as you sign a consent form before surgery to accept responsibility if something happens.

The main objective here is to create a safe environment for our users, in this case the client looking for a hair transplant needs to be sure that the source or business who contacts them is real and genuine. To ensure these conditions we will require certain criteria that the companies must meet in order to have an open profile within the website.

Also, in favour of making the process of those looking for a hair transplant easier and to also reduce their time researching endless websites, I have come up with the idea of twisting the market. So, instead of the user starting to look at different websites across the globe, this place will centralise the offers and demand in one place, where it is the companies who must search for the users and submit their best offer. Then, it will be up to the user to accept or reject that offer.

If the offer is accepted by the user, they will have access to a private chat where they can negotiate and finalise their business to reach an agreement.

1.3. Technology

Back-end development framework: Ruby on Rails

Payment Gateways: To enable transactions on the website, a payment gateway called Stripe was integrated. It provides secure and reliable payment processing solutions, making it easy for users to make purchases on the website.

Google Maps API: It is used to display maps and location data on the website. This API allows to embed maps, display markers, and get directions on the website. This API show the location of hair transplant companies and other relevant information.

Stripe API: It is used to handle online payments securely and efficiently. Each agency can pay for a subscription to be advertised in the hub/website.

Twilio API: It was used to send notifications to the user once they get an offer. This API provides a powerful communication platform that allows to send messages, make phone calls, and send alerts to users in real-time.

User authentication and authorization: To ensure the security of the website, user authentication and authorization was implemented. This was done using JSON Web Tokens, which allows the users to log in securely and protect their personal information.

1.4. Structure

- Homepage (PUBLIC)

Main purposes of the website and how HairHub works redirect link/button.

Call-to-action buttons for clients and hair transplant companies to register, log in or find a client/agency.

- Who We Are (PUBLIC)

Information about the website's mission, vision, and goals.

Background information about the team behind HairHub.

Explanation of how the platform benefits both clients and hair transplant companies

Services.

Sign up button.

- How It Works (PUBLIC)

Overview of the services provided by HairHub.

Step-by-step guide on how to use HairHub as a client or a hair transplant company.

Explanation of the registration process and profile creation.

Description of the process for submitting hair transplant requests and receiving offers.

- Find Agency (PUBLIC/PRIVATE)

Search functionality for clients to browse available hair transplant offers.

Information about the agency hosted by Google API

Display of featured offers or top-rated companies.

Send private message by click on contacting the company.

- Dashboard (PRIVATE)

Personalized dashboard for hair transplant companies after logging in.

Private tool available for agencies to receive offers and messages from clients.

Details about agencies services, pricing, and any additional information.

Integration with the website's payment system for transactions.

- **Messages Section (PRIVATE)**

    Personalized section for clients after logging in.

    Access to hair transplant requests, offers received, and ongoing negotiations.

    Notification system for new offers, messages, and updates.

- **Contact Us (PUBLIC) - How it works page.**

    Contact information for general inquiries and customer support by email.

    Feedback form for users to provide suggestions or report issues.

2.0 System
2.1. Requirements

- A website for the hair transplant industry
- A registration system for clients and agencies
- A platform where clients can submit their hair transplant request
- A platform where agencies can submit offers to clients
- A payment system for purchase transactions

2.1.1. Functional Requirements

Website basic functional Requirements:

- Website must have a user-friendly interface
- Website must have a registration system for clients and agencies
- Website must have a platform where clients can submit their hair transplant request □ Website must have a platform where agencies can submit offers to clients □ Website must have a payment system for purchase transactions.

Actions and Actors:

1. Display client requests for hair transplant treatments on the website.

2. Allow clients to submit requests for hair transplant treatments with pictures and descriptions.
3. Allow agencies to submit offers for client requests for hair transplant treatments.
4. Send notifications to clients about new offers submitted by agencies.
5. Allow clients to view and compare offers from different agencies.
6. Enable clients to accept or decline offers and proceed with the purchase transaction.
7. Provide a secure payment system for purchase transactions.
8. Allow clients to rate and review agencies and their services after completing the treatment.
9. Enable agencies to update their profiles with information about their services and prices.
10. Provide a search functionality for clients to find hair transplant agencies based on location, services, and ratings.

2.1.1.1. Use Cases Diagram
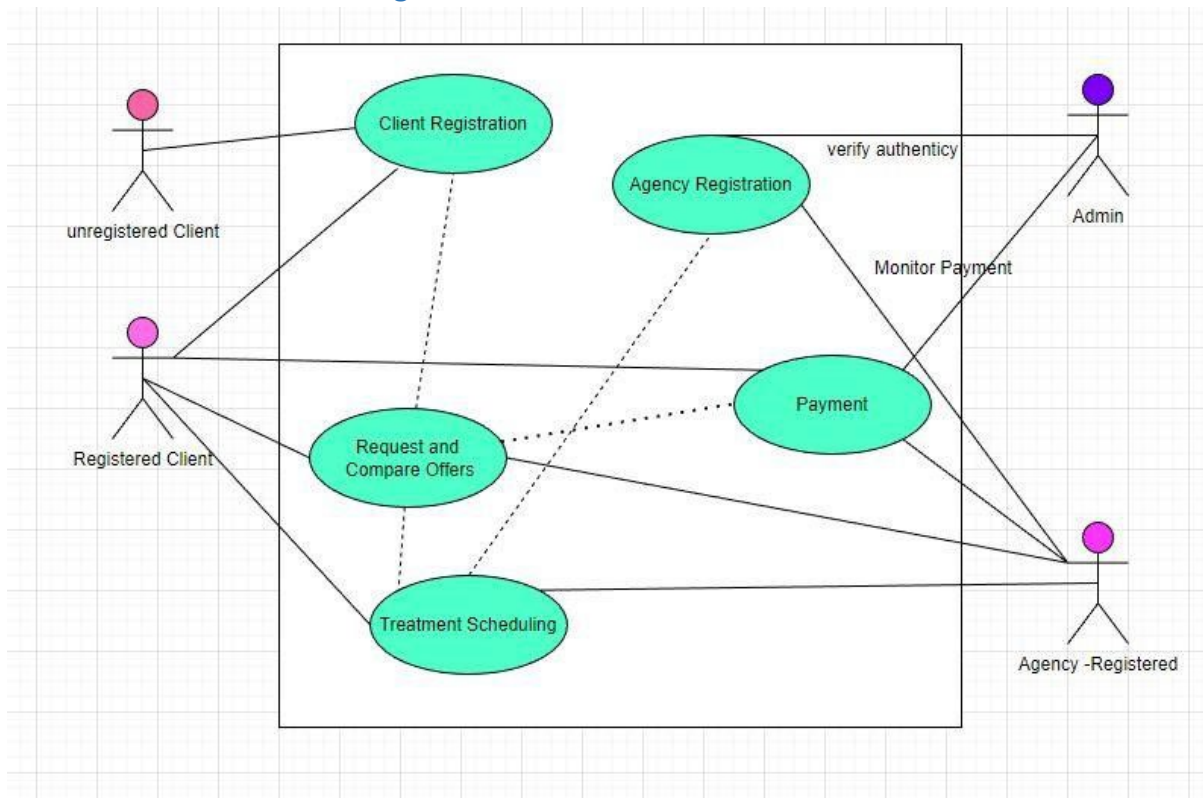
2.1.1.2. Requirements

Requirement 1 <**Request and Compare Offers**>

2.1.1.3. Description & Priority

Actor: Registered Client

Priority: High

The client logs in to the hair transplant website and submits a request for the type of treatment they are looking for, including pictures of their current hair condition. The client specifies their budget and any additional preferences or requirements. The system notifies hair transplant agencies that match the client's criteria, and they can submit offers directly to the client through the website. The client can then compare all those different offers coming from several companies and decide to accept or decline the offers.

2.1.1.4. Use Case

Scope

The client gets different offers from agencies.

Description

The client logs in to the hair transplant website and submits a request for the type of treatment they are looking for, including pictures of their current hair condition. The client specifies their budget and any additional preferences or requirements. The system notifies hair transplant agencies that match the client's criteria, and they can submit offers directly to the client through the website. The client can then compare all those different offers coming from several companies and decide to accept or decline the offers. **Use Case Diagram**
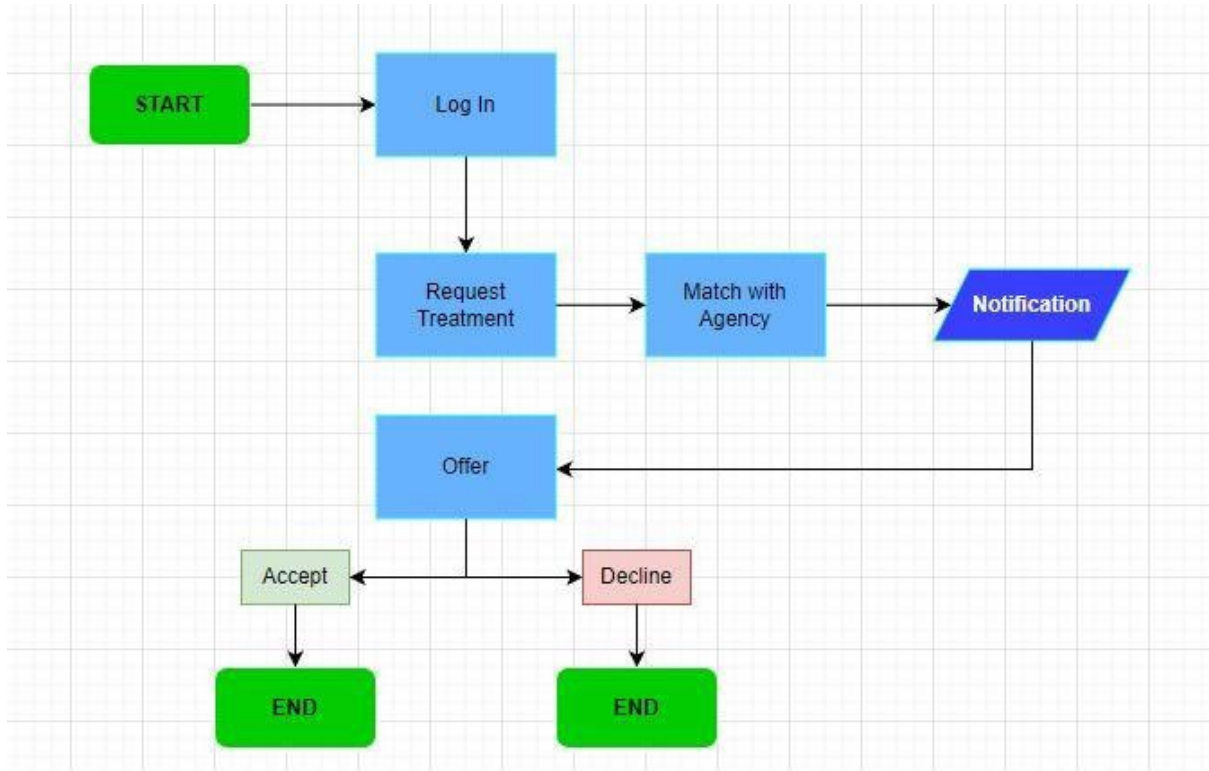
Flow Description

Precondition

- The client has a registered account on the hair transplant website and is logged in.
- The client has uploaded pictures of their current hair condition.
- Hair transplant agencies have registered accounts on the hair transplant website and are active.

Activation

It starts when the client submit a request for the type of treatment they are looking for.

Main flow

1. The client navigates to the request page on the hair transplant website and fills in the request form, specifying their budget and any additional preferences or requirements.
2. The client uploads pictures of their current hair condition.
3. The client submits the request form.
4. The system matches the client's criteria with hair transplant agencies and sends notifications to them about the client's request.

5. Hair transplant agencies submit their offers through the website.
6. The client receives the offers and compares them.
7. The client accepts or declines the offers.
8. If the client accepts an offer, the system processes the payment transaction and sends a confirmation to the client and the hair transplant agency.

Alternate flow

1A. If the client encounters any issues or errors while filling in the request form, the system displays error messages and allows the client to correct them before submitting the form.
2A. If the client encounters any issues or errors while uploading pictures, the system displays error messages and allows the client to try again or use alternative methods for uploading the pictures.
5A. If hair transplant agencies encounter any issues or errors while submitting their offers, the system displays error messages and allows them to correct them before resubmitting the offers.
7A. If the client declines all the offers, the system closes the request and notifies the hair
    transplant agencies about the decision.

Exceptional Flow

If the user encounters technical issues while using the website, they can contact the website's support team for assistance.

Termination

The user closes the website.

Post condition

- The client has received one or more offers from hair transplant agencies.
- The client has accepted or declined the offers.

Requirement 2 <**Agency Registration**>
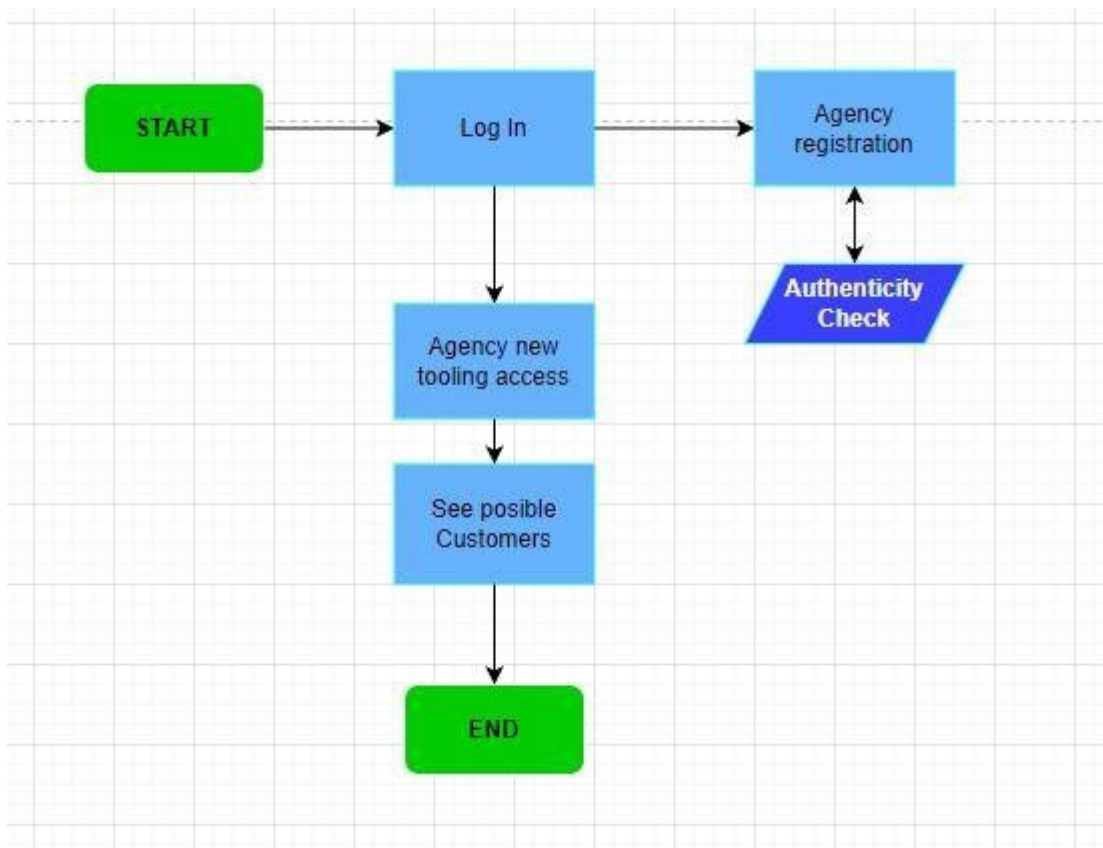
Actor: Agency

Priority: High

Scope

Hair transplant marketplace website

Description

This use case describes the process of a hair transplant company registering to offer services on the hair transplant marketplace website.

Use Case Diagram

Flow Description

Precondition

- The user has internet access and a web browser.
- The hair transplant marketplace website is accessible and functional.
- The hair transplant company has internet access and a web browser.

Activation

The hair transplant company navigates to the hair transplant marketplace website.

Main flow

1. The hair transplant company clicks on the "Register" button.
2. The website presents a registration form for the hair transplant company to fill out with their basic company information, including company name, contact information, and services offered.
3. The hair transplant company fills out the registration form and submits it.
4. The website validates the company's information and approves the registration if the information is accurate.
5. The hair transplant company receives a confirmation email indicating that their registration has been approved and their account has been activated.
6. The hair transplant company logs in to their account and sets up their company profile on the website.

7. The hair transplant company can begin to view customer requests and submit quotes for requested treatments.

Alternate flow

If the company's registration information is inaccurate or incomplete, the website may require additional information or documents to complete the registration process.

Exceptional flow

If the hair transplant company violates the website's terms of use or community guidelines, the website's administrator may suspend or terminate their account.

Termination

The hair transplant company logs out of their account or closes the website.

Post condition

- The hair transplant company has an active account on the hair transplant marketplace website.
- The hair transplant company can view customer requests and submit quotes for requested treatments.

Requirement 3 <**Hair transplant treatment scheduling**>
 Actor: Client

  Priority: High

Scope

The potential client wants to schedule a hair transplant treatment with a hair transplant company they have selected after receiving multiple quotes.

Description

The client log in check all offers available and pick the one that more adjust their needs.
Once it is accepted it triggers a notification in the Agency side who will need to accept it. Payment must be processed by the client and a new chat for both of them will be available.

Use Case Diagram
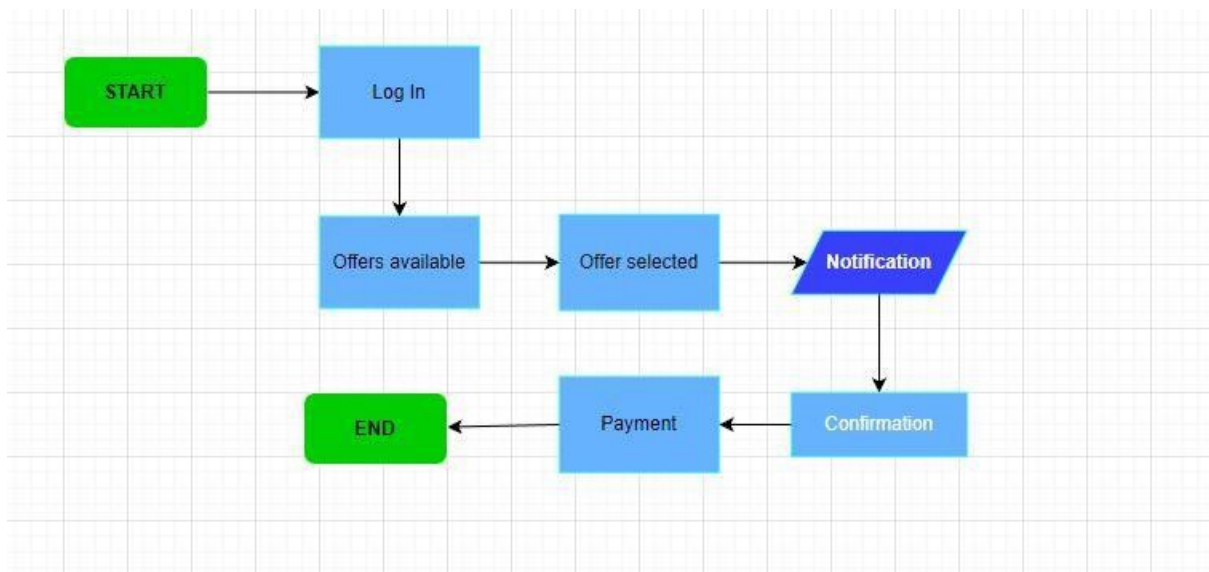
Flow Description

Precondition

- Potential client has registered and created a profile on the website.
- Potential client has received multiple quotes from hair transplant companies and selected the one they want to schedule a treatment with.

Activation

Potential Client is interested in an offer.

Main flow

1. Potential client contacts the hair transplant company to schedule a treatment.
2. Hair transplant company confirms availability and schedules the treatment for the agreed-upon date and time.
3. The potential client pays a deposit to the hair transplant company to secure the treatment slot.

Alternate flow

1A. The hair transplant company is not available on the dates and times requested by the potential client.

- The hair transplant company proposes alternative dates and times that work for both parties.

2A. The potential client changes their mind and wants to schedule a treatment with a different hair transplant company.

- The potential client contacts the other hair transplant company to schedule the treatment and cancels the original scheduled treatment.

3A. The potential client is unable to pay the deposit to the hair transplant company.

- The potential client and the hair transplant company negotiate an alternative payment arrangement, or the potential client decides not to pursue the hair transplant treatment.

Exceptional flow

The website administrators have to ensure that both the potential client and the hair transplant company comply with the website's terms and conditions regarding the scheduling of treatments and payment arrangements.

Termination

One of the parties doesn't meet requirements or conditions, admin terminates the

offer. **Post condition**

- The potential client has scheduled a hair transplant treatment with a hair transplant company.
- The hair transplant company has scheduled a treatment with a potential client and received a deposit to secure the treatment slot.

Requirement 4 < **Payment**>
　　Actor: Registered Client

　　Priority: High

Scope

The payment process starts after the client has selected an offer from the hair transplant companies and has decided to make a purchase transaction.

Description

The payment process is a critical component of the hair transplant website's functionality, as it allows clients to complete their transactions securely and efficiently. By leveraging a trusted payment gateway, clients can have confidence in

the safety of their financial information and hair transplant companies can receive timely payments for their services.

Use Case Diagram
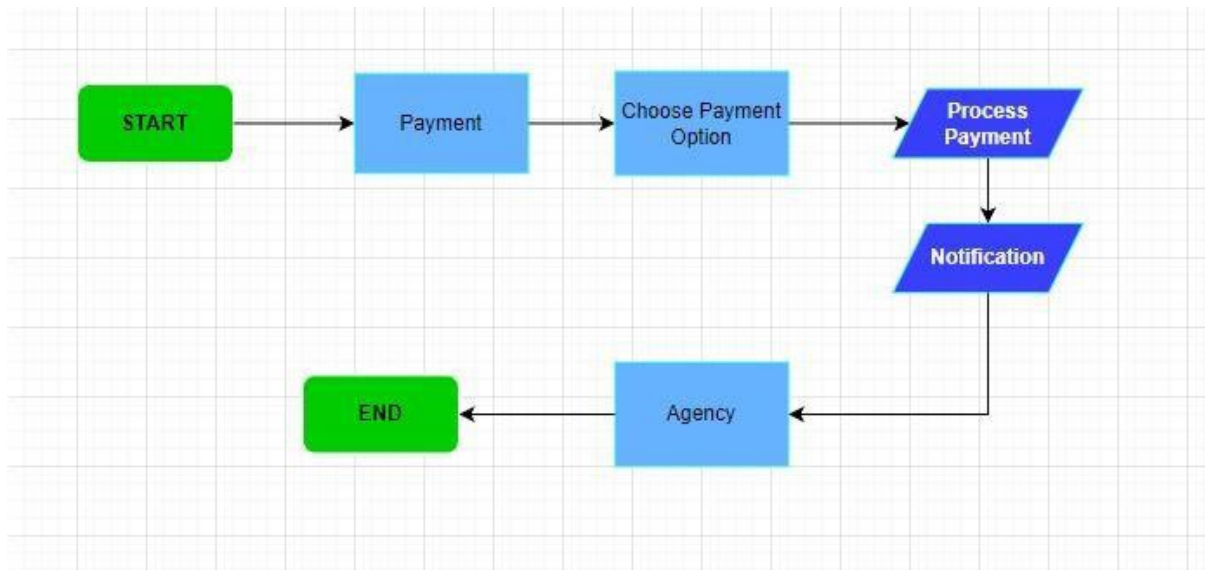
Flow Description

Precondition

The client has selected an offer from a hair transplant company and has agreed to make a purchase transaction on the website.

Activation

The client clicks on the payment button on the website, which redirects them to the payment gateway.

Main flow

1. The payment gateway displays the payment options available to the client (credit card, PayPal, etc.).
2. The client selects their preferred payment method and enters their payment information.
3. The payment gateway securely processes the payment information and authorizes the transaction.
4. The payment gateway sends a notification to the website and the hair transplant company about the successful payment.

Alternate flow

If the payment is declined, the payment gateway will notify the client and ask them to try a different payment method or contact their bank to resolve the issue.

If the client requests a refund for the payment, the hair transplant company will need to approve the refund through the website. The payment gateway will then process the refund and notify the client. The hair transplant company will need to work with

the client to ensure that any issues with the payment or treatment are resolved to the client's satisfaction.

Exceptional flow

If there is an error during the payment process, such as a network outage or a technical error, the payment gateway will notify the client and provide instructions on how to proceed.

Termination

The payment process ends when the payment gateway has successfully processed the payment and notified the website and hair transplant company.

Post condition

The hair transplant company receives the payment and can begin to schedule the client's appointment for the hair transplant treatment.

Requirement 5 < **Client Registration** >
    Actor: Unregistered Client

    Priority: High

Scope

The client registration process includes creating an individual profile, submitting pictures and writing a request for the type of hair transplant treatment they are looking for.

Description

The client registration process is a critical step for clients who want to browse hair transplant options on the website. By creating a profile, clients can receive offers directly from hair transplant companies and compare different treatment options. This process helps to centralize information and streamline the hair transplant market online.

Use Case Diagram
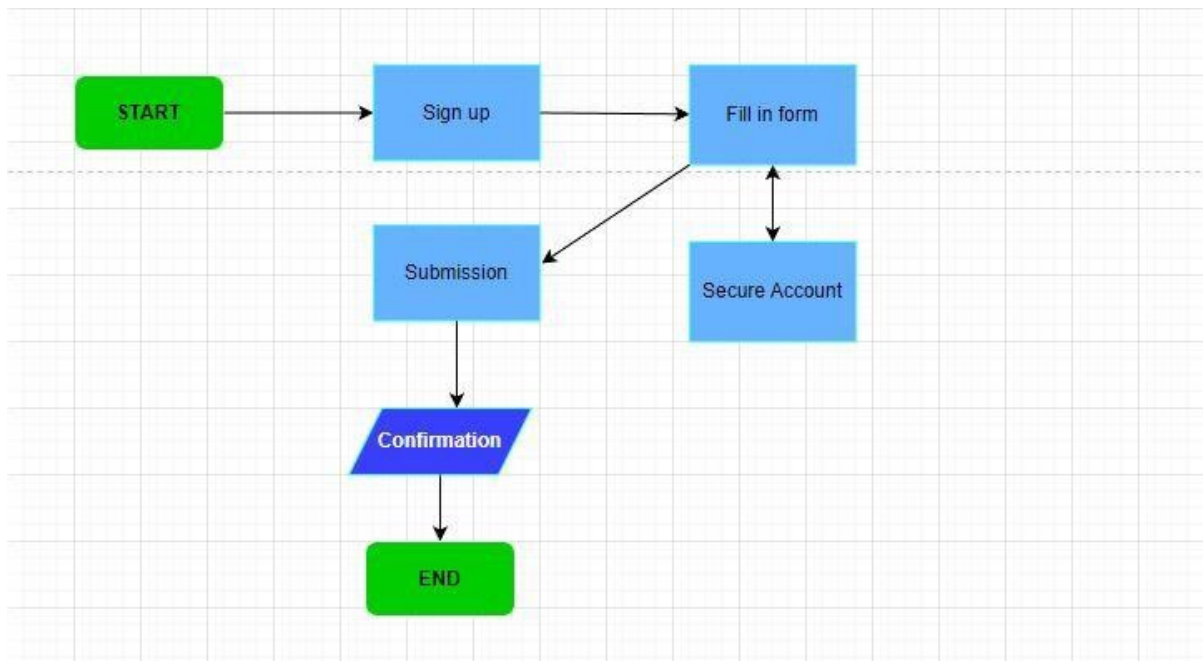
Flow Description

Precondition

The client has access to a device with an internet connection and has navigated to the hair transplant website.

Activation

The client clicks on the "Register" button on the website.

Main flow

1. The client is directed to a registration form.
2. The client fills out the form, providing their personal information such as name, email, and phone number.
3. The client selects a username and password for their account.
4. The client submits the form to the website.
5. The website confirms that the registration was successful and sends an email to the client to confirm their account.

Alternate flow

1A. If the client does not want to create a profile, they can still browse through the website without logging in.

5A. If the client enters incomplete or incorrect information, an error message is displayed and the client is prompted to correct their information.

3A. If the client's chosen username is already taken, the website prompts the client to choose a different username.

Exceptional flow

5A. If there are technical issues or server errors, the website may not be able to process the registration.

5B. If the website suspects fraudulent activity, the registration may be flagged for review and the client may be asked to provide additional information.

Termination

The client successfully completes the registration process, and their profile is stored in the website's database.

Post condition

The client can now log in and browse through different offers from various companies, and can select the best offer that suits their needs.

2.1.2. Data Requirements

1. **Client information:** This includes personal information such as name, email, phone number, and address. It also includes information related to the hair transplant request such as pictures of the client's hair, details about the type of treatment they are looking for, and any other relevant information.

2. **Agency information:** This includes company information such as name, address, phone number, and email. It also includes information related to the agency's offer such as details about the treatment they are offering, pricing, and any additional information.

3. **Payment information:** Generated and handled by third party API Stripe.

4. **User account information:** This includes login credentials such as username and password, as well as user profile information such as profile picture and bio.

5. **Analytics and metrics data:** This includes data related to website usage, such as page views, user engagement, and conversion rates. This data can be used to improve the website's performance and user experience.

6. **Feedback and reviews data:** This includes data related to client feedback and reviews on the hair transplant treatment they received, including ratings, comments, and testimonials. This data can be used to improve the quality of the service provided by agencies.

7. **Security and privacy data:** This includes data related to user privacy, such as user consent to share their data, and security measures to protect user data such as encryption, firewalls, and intrusion detection.

8. **Admin data:** This includes data related to the website's administrators, such as login credentials and permissions, and data related to the management of the website, such as site settings, notifications, and reporting tools.

2.1.3. User Requirements

1. **Easy registration and profile creation:** Users should be able to create an account and profile easily and quickly, with minimal required information.

2. **Clear and intuitive user interface:** The website should have a user-friendly interface that is easy to navigate and understand, with clear labels and instructions.

3. **Comprehensive information on hair transplant treatments:** The website should provide detailed and accurate information about different hair transplant treatments, their benefits, risks, and costs, to help users make informed decisions.

4. **Transparent and fair pricing:** The website should provide transparent pricing information for different hair transplant treatments, and help users compare offers from different agencies to find the best price.

5. **Secure and private platform:** The website should ensure user privacy and data security by implementing appropriate security measures such as encryption, firewalls, and intrusion detection.

6. **Reliable and responsive customer support:** The website should offer reliable and responsive customer support through various channels such as email, phone, or live chat, to help users with any questions or issues they may have.

7. **High-quality services from agencies:** The website should partner with reputable and high-quality agencies that offer safe and effective hair transplant treatments, and provide user feedback and reviews to help users choose the best agency for their needs.

8. **User feedback and reviews:** The website should allow users to leave feedback and reviews on the agencies and treatments they have used, to help other users make informed decisions.

9. **Easy payment and transaction process:** The website should provide a secure and easy payment and transaction process, with multiple payment options and quick transaction processing times.

2.1.4. Environmental Requirements

1. **Internet connectivity:** The website requires a stable and reliable internet connection to function properly, as it is an online platform.

2. **Compatible devices and browsers:** The website should be compatible with different devices such as desktops, laptops and tablets, and with different web browsers such as Chrome, Firefox, Safari, and Internet Explorer.

3. **Compliance with industry standards and regulations:** The website should comply with relevant industry standards and regulations such as data protection laws, health and safety regulations, and consumer protection laws.

4. **Server capacity and performance:** The website should have sufficient server capacity and performance to handle the expected traffic and user interactions, and to ensure fast and reliable response times.

5. **Backup and recovery mechanisms:** The website should have backup and recovery mechanisms in place to ensure data is not lost or damaged in case of hardware failure or other system failures.

6. **Accessibility:** The website should be accessible to users with disabilities, by complying with accessibility standards and guidelines such as the Web Content Accessibility Guidelines (WCAG).

7. **Scalability:** The website should be scalable to accommodate potential growth in traffic and user interactions, without affecting performance or user experience.

8. **Availability and uptime:** The website should have high availability and uptime, to ensure users can access it at any time without interruption.

9. **Geographic location:** The website may have to comply with different regulations and legal requirements depending on the geographic location of its users, agencies, and partners.

2.1.5. Usability Requirements

1. **Intuitive and user-friendly interface:** The website should have a simple and intuitive interface, with clear and consistent navigation and layout, to allow users to find information and features quickly and easily.

2. **Clear and concise content:** The website should use clear and concise language, with simple and easy-to-understand descriptions and instructions, to avoid confusion or misunderstanding.

3. **Minimal user input:** The website should minimize the amount of user input required, by using pre-filled forms, auto-complete, and other features to reduce the time and effort required from users.

4. **Consistent and recognizable design:** The website should use consistent and recognizable design elements, such as fonts, colours, and logos, to help users recognize and remember the website and its features.

5. **Error prevention and handling:** The website should prevent errors or mistakes by using error prevention techniques such as confirmation prompts, tooltips, and warning messages. It should also provide clear and helpful error messages and instructions when errors do occur.

6. **Feedback and confirmation:** The website should provide clear and immediate feedback and confirmation to users when they perform actions or submit information, to help them understand what is happening and avoid confusion or uncertainty.

7. **Personalization and customization:** The website should allow users to personalize and customize their experience, by providing features such as saved searches, preferences, and settings.

8. **User assistance and support:** The website should provide user assistance and support, such as FAQs, help articles, and user guides, to help users understand the website and its features.

9. **Multilingual support:** The website should support multiple languages, to allow users from different regions and countries to use the website in their native language.

10. **Responsiveness and adaptability:** The website should be responsive and adaptable to different screen sizes and resolutions, to ensure a consistent user experience across different devices and platforms.

2.2 Design & Architecture

HairHub is a web application built using the Ruby on Rails framework. It is considered a popular due to its Model-View-Controller architecture. This application serves as a central source of information for people looking for details about hair transplants. It offers users a platform to discover customized treatment options efficiently. The integration of Stripe, Twilio, and Google Maps API enhances the user experience and provides essential features like subscription management, real-time communication, and geolocation search.

Some of the **Key Features** within the application:

Frontend (View): The frontend of HairHub is responsible for presenting the user interface to the users and handling user interactions. It is built using HTML, CSS, and JavaScript, and Rails' asset pipeline manages the frontend assets. The frontend

communicates with the backend through HTTP requests to retrieve data and update the views.

Backend (Model and Controller): The backend of HairHub consists of the Rails application, which manages the business logic, data storage, and API endpoints. The backend communicates with various external services and APIs to fulfill user requests and provide necessary information.

Database (PostgreSQL): PostgreSQL is used as the primary database management system for HairHub. It stores user accounts, agency details, messages, subscriptions, and other related data.

User Authentication (Devise): The user authentication system is implemented using the Devise gem, which provides features like user registration, login, and account management. It securely manages user passwords and sessions.

Subscription Management (Stripe): Stripe's Subscription Payment system is integrated into HairHub to handle agency subscriptions. This integration allows agencies to sign up for subscriptions, manage their subscription status, and handle payment transactions for the subscription services.

Real-time Communication (Twilio): The platform enhances communication between users and agencies through Twilio Whatsapp integration. Twilio is a communication API platform that allows for real-time messaging and communication features.

Geolocation Search: HairHub utilizes the Google Maps API to enable users to search for nearby agencies. This feature leverages geolocation to display agencies on a map, making it easier for users to find relevant services in their area.

Responsive Design: HairHub is designed with a responsive and mobile-friendly layout, it allows user to have a better experience and ensuring a consistency across various devices.

User Flow:

- A user or an agency can register and log in to the HairHub platform using their email and password.
- Agencies can subscribe to the platform using the Stripe Subscription Payment system. This subscription allows agencies to feature their services on the website.
- Users can search for nearby agencies using the Google Maps API's geolocation search.
- Users and agencies can send each other messages in real-time using Twilio's WhatsApp.

- Agencies can claim their listings by subscribing and making payments. This feature allows agencies to have more control over their listings and services.

Data Flow:

- All the information from users and agencies, are stored in the PostgreSQL database.
- In order to maintain the user's authenticated status the backend keeps the user verified with their credentials.
- Agencies can subscribe to the platform using Stripe.
- When a user searches in the map for agencies around, the backend fetches the database and uses the Google Maps API to display the agencies on the frontend.
- It is possible messaging and real-time communication. The Twilio API permits the backend to send and receive messages.

Components Used like **libraries and gems**:

Ruby on Rails: The primary framework used to develop the web application, providing a robust foundation for building and deploying web services.

RSpec: A testing framework used for writing unit and integration tests to ensure the application's functionality and code quality.

FactoryBot: A library for defining and creating test data, which is helpful for writing tests with realistic and reliable data.

Capybara: An acceptance test framework that simulates user interactions with the web application, enabling end-to-end testing.

Devise: A flexible authentication solution for Ruby on Rails, used for managing user authentication and registration.

Twilio-Ruby: The official Twilio API wrapper gem used to integrate Twilio's WhatsApp functionality for real-time communication.

Stripe: The Stripe API wrapper gem used to handle subscription payments and integrate Stripe's subscription payment system.

Geocoder: A gem simplifying geocoding and reverse geocoding, allowing the integration of Google Maps API for geolocation search.

Faker: A gem used to generate random data, commonly employed to create realistic test data during development and testing.

SimpleCov: A code coverage analysis tool that helps track test coverage and ensures thorough testing of the application.

<u>**Continuous Integration (CI):**</u>

HairHub has implemented continuous integration to maintain code quality. It utilizes tools like GitHub Actions or Travis CI, where the CI configuration is set up to automatically run tests and check for code style violations on every pull request and push to the main branch. This ensures that changes are continuously tested and validated, helping maintain a reliable and stable codebase.

Ruby libraries – API – Visual Studio – Stripe – Twilio - db

2.3 Implementation

1. **Setting up the Project:**
- Install Ruby, Rails, PostgreSQL, Node.js, and Yarn on your development machine.
- Create a new Rails application using the rails command.
- Set up the database configuration in config/database.yml to connect to PostgreSQL.
- Create models, controllers, and views for Users, Agencies, Subscriptions, and Messages.

2. **User Authentication with Devise:**
- Gem 'devise' was added to the Gemfile. Then it is necessary to run and install devise in the terminal by running:
  ```
  rails generate devise:install
  ```
- After it is installed, I created the model for the user and migrate it to the database.
  This is a regular process to create the model's user/agency.
- The route path was added into config/routes.rb and, I added the authentication filters to restrict access to certain pages for authenticated users.

  User model represents user accounts. It is automatically generated by devise to handle authentication, registration, and session management. (See screenshot below)

```
app > models > user.rb
  1   # frozen_string_literal: true
  2
  3   class User < ApplicationRecord
  4     # Include default devise modules. Others available are:
  5     # :confirmable, :lockable, :timeoutable, :trackable and :omniauthable
  6     devise :database_authenticatable, :registerable,
  7            :recoverable, :rememberable, :validatable
  8
  9     enum :role, %i[client owner]
 10
 11     has_one :user_subscription, dependent: :destroy
 12
 13     alias_attribute :subscription, :user_subscription
 14
 15     has_many :agencies, dependent: :destroy
 16
 17     before_create :set_stripe_reference_id
 18
 19     def claim(agency) AppMap
 20       raise if agency.blank?
 21
 22       AgencyRegistrationService.new(self, agency).call
 23     end
 24
 25     private
 26
 27     def set_stripe_reference_id
 28       return unless owner?
 29
 30       self.stripe_reference_id = Devise.friendly_token
 31     end
 32   end
 33
```

All the devise views are autogenerated and then I have modified them using bootstrap (as in the rest of the webapp) and other small changes.

```
∨ HAIR_HUB
  ∨ views
    > agencies
    ∨ devise
      ∨ confirmations
          new.html.erb
      ∨ mailer
          confirmation_instructions.html.erb
          email_changed.html.erb
          password_change.html.erb
          reset_password_instructions.html.erb
          unlock_instructions.html.erb
      ∨ passwords
          edit.html.erb
          new.html.erb
      ∨ registrations
          edit.html.erb
          new.html.erb
      ∨ sessions
          new.html.erb
      ∨ shared
          _error_messages.html.erb
          _links.html.erb
      > unlocks
```

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3. Sign up for a Google Maps API key:
   To use Google Maps API I needed to create a project, click on the credentials button and choose API Key. After this API key was generated with the proper settings, restrict the key to only allow usage from certain IP, this key was pasted in the .env file within the Hairhub project.

   Google Maps API was used inside the HairHub web application to display maps and locate data related to hair transplant companies. This was achieved by using the GM JavaScript API which allows embedding maps and showing markers with information about each of the agencies.

   The map interaction allows the user to interact with the information in the markers, the map and the search. This function has also relevant location data (latitude and longitude) of the hair transplant companies from the database and places markers on the map accordingly.

```javascript
import { Controller } from "@hotwired/stimulus"

// Connects to data-controller="places"
export default class extends Controller {
  static targets = ["field", "map", "latitude", "longitude"];

  connect() {
    if (typeof(google) !== "undefined") {
      this.initMap();
    }
  }

  keyDown(e) {
    if (e.key === "Enter") {
      e.preventDefault();
    }
  }

  initMap() {
    this.map = new google.maps.Map(this.mapTarget, {
      center: new google.maps.LatLng(39.9208, 32.8541),
      zoom: 6
    });

    this.autocomplete = new google.maps.places.Autocomplete(this.fieldTarget);
    this.autocomplete.bindTo("bounds", this.map);
    this.autocomplete.setFields(["address_components", "geometry", "icon", "name"]);
    this.autocomplete.addListener("place_changed", this.placeChanged.bind(this));

    this.marker = new google.maps.Marker({
      map: this.map,
      anchorPoint: new google.maps.Point(0, -29)
    });

    $.get("/agencies.json").done((agencies) => {

      agencies.forEach((agency) => {
        const infoWindow = new google.maps.InfoWindow();

        const marker = new google.maps.Marker({
          map: this.map,
          position: new google.maps.LatLng(agency.latitude, agency.longitude),
          title: agency.name,
        });

        marker.addListener("click", () => {
          infoWindow.setContent(getInfoWindowContent(agency));
          infoWindow.open(marker.getMap(), marker);
        });

        function getInfoWindowContent(agency) {
          return `
            <h3>${agency.name}</h3>
            <div>${agency.pitch}</div>
            <hr>
            <b>${agency.phone}</b>
            <hr>
            <a href='/agencies/${agency.id}/messages/new' class='btn btn-outline-info my-6 my-sm-0'>Co
          `;
        }
      });
    });
  }

  placeChanged() {
    let place = this.autocomplete.getPlace();

    if (!place.geometry) {
      window.alert(`No details available for input: ${place.name}`);
      return;
    }

    if (place.geometry.viewport) {
      this.map.fitBounds(place.geometry.viewport);
    }
    else {
      this.map.setCenter(place.geometry.location);
      this.map.setZoom(17);
    }

    this.marker.setPosition(place.geometry.location);
    this.marker.setVisible(true);

    this.latitudeTarget.value = place.geometry.location.lat();
    this.longitudeTarget.value = place.geometry.location.lng();
  }
}
```

   The initMap() function is responsible for initializing the Google Map and the Autocomplete functionality for the location search field (this.fieldTarget). The function also defines an inner function getInfoWindowContent(agency) to generate HTML content for agency marker (little windows).

Also, I would like to explain the placeChanged() function which is called when the user selects a place from the autocomplete results. It updates the map's centre and marker position according to the selected place and populates the hidden latitude and longitude fields with the selected place's coordinates.

This is the example of the map view:
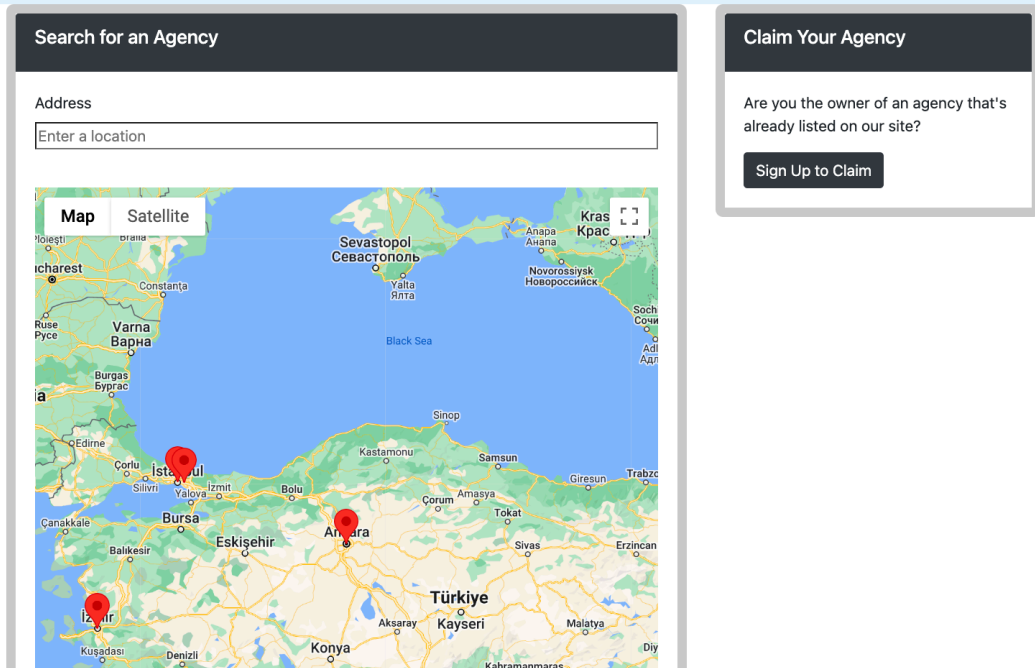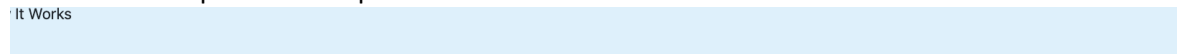
We can also zoom in and out panning or clicking on each marker to get more information about the agencies.
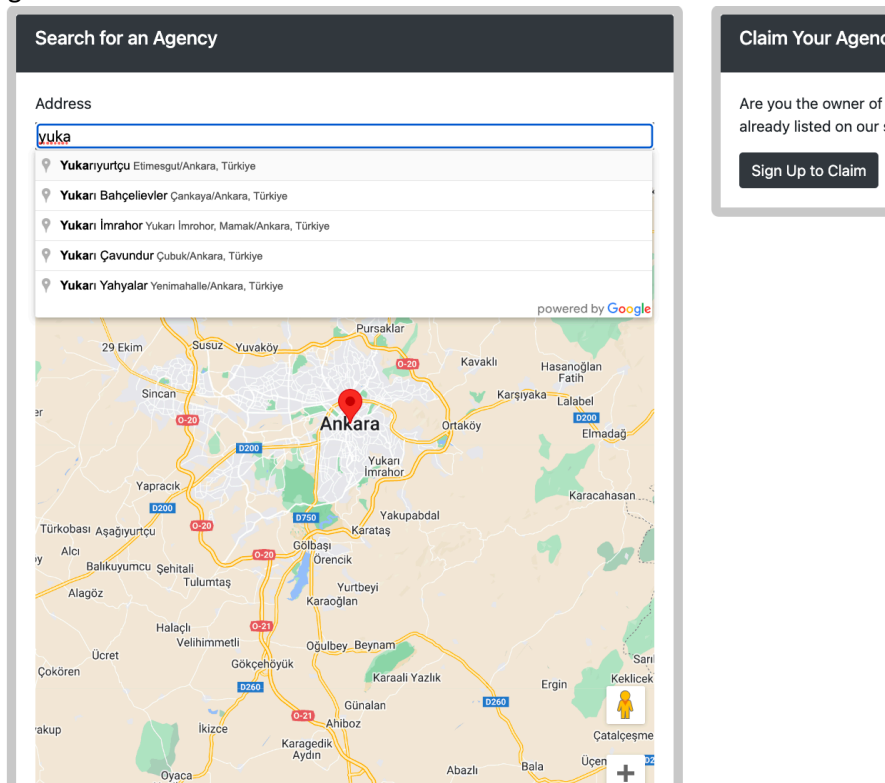
Before I finish this API explanation, I would like to speak about Stimulus controller, based on this line in the code (first line).

```
import { Controller } from "@hotwired/stimulus"
```

This line of code declares a new Stimulus controller, which connects to the HTML element with data-controller="places". This controller will handle the functionality associated with places and agencies on the HairHub website.

4. Subscription Management with Stripe:

To implement Stripe for payments when the agencies pay a 3months subscription. A controller name StripeController was built to handle Stripe webhook events. The controller class is inheriting from ApplicationController and the webhook action is the endpoint where Stripe sends the events. This way, when Stripe sends an event to this endpoint the controller created a new instance of the StripeProcessor class.

The controller processes Stripe webhooks, and upon successful processing, it updates user data related to their Stripe subscriptions based on the information received in the webhook payload.

```ruby
3    class StripeController < ApplicationController
4      protect_from_forgery except: :webhook
5
6      def webhook
7        StripeProcessor.new(request).call.tap do |result|
8          if result.success?
9            maybe_update_user(result)
10           head :ok
11         else
12           head :internal_server_error
13         end
14       end
15     end
16
```

protect_from_forgery except: :webhook: This line specifies that CSRF protection should be enabled for all actions in this controller except for the webhook action.

The StripeProcessor within Services was needed and designed to handle incoming webhook events from the Stripe platform. The event processing identifies the event type and handles it appropriately.

```ruby
 7        @signature = request.env[ HTTP_STRIPE_SIGNATURE ]
 8        end
 9
10 ∨      def call
11          parse_event
12          case event.type
13          when 'checkout.session.completed'
14            handle_session_completed
15          when 'payment_intent.succeeded'
16            handle_payment_succeeded
17          when 'payment_intent.payment_failed'
18            handle_payment_failed
19          when 'customer.subscription.updated'
20            handle_subscription_updated
21          else
22            ignore_event
23          end
24        rescue StandardError => e
25          error(e)
26        end
27
```

To show the pricing table in HairHub the following view was created:

```html
1    <div class="container" style="margin-top: 40px">
2      <script async src="https://js.stripe.com/v3/pricing-table.js"></script>
3      <stripe-pricing-table
4        pricing-table-id="                              q"
5        publishable-key="                                                                        hSPxYxxi2APQUxpopDW00ZWhonOVN"
6        client-reference-id="<%= current_user.stripe_reference_id %>"
7        >
8      </stripe-pricing-table>
9    </div>
```

It loads the necessary Stripe JavaScript library and display the pricing options for the agencies. To make it work, the is a unique ID for the pricing table and a public key provided by Stripe. Additionally, it dynamically sets a "client-reference-id" attribute based on the current user's Stripe reference ID, which helps link the pricing table to the correct user.

5. Real-time Communication with Twilio:

    To create a real time communication with Twilio and WhatsApp, I created an account in Twilio, generate Key and modify the phone number.
    After that I needed to install the gem Twilio-ruby and create the TwilioService class.
    It is easy to set up Twilio configuration as you need to add SID, Token, Twilio number and WhatsApp number. All of this is provided inside Twilio account.
    Scan the QR code in the Twilio account to allow Sandbox to connect with your WhatsApp so you start getting messages from the app.

```
1   class TwilioService
2       cattr_accessor :account_sid, :auth_token, :twilio_number, :twilio_whatsapp_number
3       attr_reader :to_mobile_number, :message_body, :client
4
5       def initialize(to_mobile_number, message_body)
6         @to_mobile_number = to_mobile_number
7         @message_body = message_body
8         @client = Twilio::REST::Client.new(TwilioService.account_sid, TwilioService.auth_token)
9       end
10
11      def call
12        @client.messages.create(
13          body: message_body,
14          from: whatsapp(TwilioService.twilio_whatsapp_number),
15          to: whatsapp(to_mobile_number)
16        )
17      end
18      private
19
20      def whatsapp(number)
21        "whatsapp:#{number}"
22      end
23   end
24
```

After all the configuration a new model called Message was created together with the controller called MessagesController to handle the message creation and to follow up message.

```
1    # frozen_string_literal: true
2
3    class Message < ApplicationRecord
4      validates :content, presence: true
5      attr_accessor :user_mobile_number
6
7      belongs_to :agency
8      belongs_to :user
9
10     after_create :text_user_followup_message
11
12     def self.user_messages_grouped_by_agency(user) ⚲AppMap
13       preload(:agency).where(user: user).group_by { |m| m.agency.name }
14     end
15
16     private
17
18     # Probably better suited for a background job.
19     def text_user_followup_message
20       TwilioService.new(
21         user_mobile_number,
22         followup_message
23       ).call
24     end
25
26     def followup_message
27       "Thanks for reaching out!\nWe will contact you soon.\nYour friends at #{agency.name} 🎉"
28     end
29   end
30
```

```ruby
# frozen_string_literal: true

class MessagesController < ApplicationController
  before_action :authenticate_user!
  before_action :set_agency, except: [:index]

  def index AppMap
    @messages = Message.user_messages_grouped_by_agency(current_user)
  end

  def new AppMap
    @message = Message.new
  end

  def create AppMap
    message = Message.new(message_params)
    message.user = current_user
    message.agency = @agency

    @agency.messages << message

    if @agency.save
      redirect_to root_url, notice: 'Message Sent'
    else
      render :new
    end
  end

  private

  def message_params
    params.require(:message).permit(:user_mobile_number, :content)
  end

  def set_agency
    @agency = Agency.find(params[:agency_id])
  end
end
```

6. Documentation
   Create and update daily this documentation and the README.me file with clear instructions.

2.4 Graphical User Interface (GUI)

Main – Homepage

In the homepage users can find a link with more information on how the platform works. Also, featuring call-to-action buttons for clients and hair transplant agencies to register, log in, and access tools to find suitable matches.

Search   Search

Agencies   Who We Are   How It Works   Log In   Sign Up

MAGIC
HAIR HUB
HOW IT WORKS
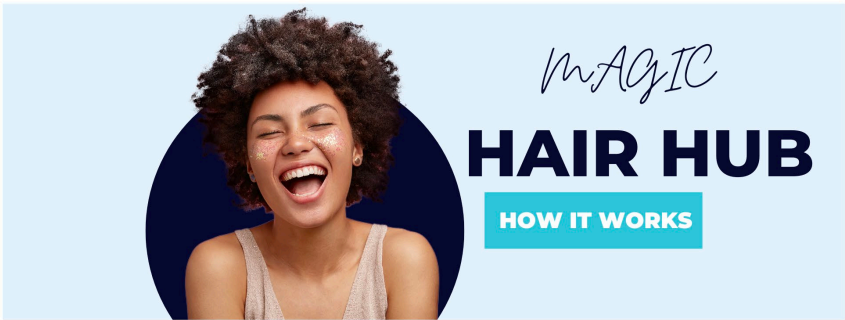
Get Help to Find the Best Deal

Looking for the best hair transplant agency?

Connect With Agencies Around the World

Find thee best offers from different agencies that suit your needs

Find an Agency
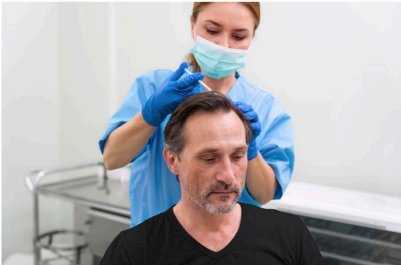
Looking for the best client ever imagined?

Find out more about clients who need your services

Find the best clients who are currently looking for services like yours

Find a Client

Connect with more than 23k Clients and around 8k Agencies

Be Part of Our COMMUNITY

www.hairhub.com

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How It works Page

Where we can find HairHub offers a comprehensive range of services, including a step-by-step guide on using the platform as a client or agency, registration, and profile creation process, as well as a contact form.

Who We Are

In the "Who We Are" section, you can find comprehensive information about our company, including our mission, vision, and values. This section provides an overview of our background, expertise, and the core principles that guide our operations.

- About HairHub -

"Best Central Source of Information for Hair Transplants"

Why HairHub?

The hair transplant industry is in high demand and we believe that this is due to the increasing importance that people place on taking care of their health and bodies. However, despite the popularity of hair transplants, there is a lack of information and transparency in the market. Clients often have to do their own research on multiple sites to find the information they need, making it a time-consuming and frustrating process.

Our project seeks to address this issue by creating a website where clients can register and create their own individual profile. They can then submit pictures and a request for the type of treatment they are looking for. Companies can submit offers directly to the client, allowing them to compare different offers from several companies. If the client decides to accept an offer, the transaction can be completed securely through our website.

Our Vision

We want to change the way the market for hair transplants works by putting the onus on businesses to find clients, rather than clients having to do all the legwork themselves. By creating a central hub for information and offers, we hope to make the process of finding a reputable hair transplant company easier and faster for everyone.

Our project is unique in that we centralize all the information about hair transplants in one space, creating a safe and secure environment for clients to make their purchases. By doing so, we hope to eliminate the risk of fraudulent third parties and give clients peace of mind when making their decision.
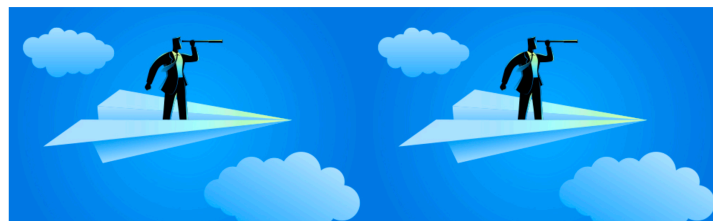
Join HairHub Today

If you are interested in undergoing a hair transplant or if you are a company that offers this service, we invite you to join HairHub today. By registering with us, you will gain access to a community of clients and businesses that are passionate about hair transplants and providing a high-quality service. Join us today and be part of the future of the hair transplant industry!

Sign Up

Search for an Agency & Claim your Agency

In this section of the website, users can search for hair transplant agencies based on their location and establish contact with them. For individuals seeking hair transplant services, they can explore the available agencies in their desired location and initiate communication. On the other hand, if an agency is not listed or claimed by its respective owner, users also have the option to claim the agency as their own business and create an account to manage its profile.

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Login

In the login section, users have the option to log in either as a client or as an agency. Depending on the type of user they are, they will be granted access to different tools and sections within their profile. As a client, users will have access to features such as searching for agencies by location, contacting them, and submitting hair transplant requests. On the other hand, agencies logging in will have additional functionalities tailored to their needs, such as managing their business profile, responding to client inquiries, and submitting offers for hair transplant services.

Login as Client

Email

Email

Password

Password

☐ Remember me

Log in

Sign up
Forgot your password?

Dashboard's Agency

This dashboard is designed for registered agencies on our website who have claimed their presence on Google Maps. It empowers agencies to manage and personalize their profile by editing their company name, creating attractive offers, and facilitating seamless communication with potential clients through messaging.

Top Partners Section

The Top Partners section is dedicated to showcasing all the agencies that have paid a subscription. It serves as a comprehensive directory of available agencies that have chosen to partner with us. If you are unable to find a specific agency in this section, we offer a convenient "Find Agency Near You" button, which allows you to explore nearby agencies on Google Maps API. Additionally, we provide the option to send private messages directly to these companies displayed on the map.

2.5 Testing

The project uses RSpec as the testing framework. Additionally, FactorBot is used for creating test data (factories). Those tests are organised into different folders such as 'spec/models' and 'spec/factories' (see screenshot below).
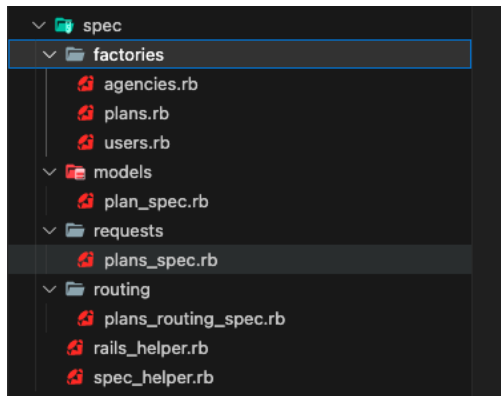
Different types of testing were built like:

- **Unit Testing inside models folder.** This test includes positive and negative scenarios for creating and validating Plan instances.

```
spec > models > 🔴 plan_spec.rb
 1    require 'rails_helper'
 2
 3    RSpec.describe Plan, type: :model do
 4      let(:valid_attributes) do
 5        {
 6          agency: create(:agency),
 7          title: Faker::Alphanumeric.alpha(number: 10),
 8          description: Faker::Alphanumeric.alpha(number: 200),
 9          price: Faker::Number.between(from: 100, to: 600)
10        }
11      end
12
13      let(:invalid_attributes) do
14        {
15          agency: create(:agency),
16          title: nil,
17          description: nil,
18          price: nil
19        }
20      end
21
22      describe "save" do
23        context "with valid attributes" do
24          it "creates new plan" do
25            subject = described_class.new(valid_attributes)
26
27            expect(subject.save).to be(true)
28            expect(subject.errors).to be_empty
29          end
30        end
31      end
32
33      context "with invalid attributes" do
34        it "adds validation errors" do
35          subject = described_class.create(invalid_attributes)
36
37          expect(subject.save).to be(false)
38          expect(subject.errors).not_to be_empty
39        end
40      end
41    end
42
```

- Request/Integration testing inside requests folder. These test use HTTP request to simulate user interactions with the platform/application and verify that the controller actions behave as expected.

```ruby
1    require 'rails_helper'
2
3    RSpec.describe "/plans", type: :request do
4      let(:agency) do
5        create(:agency)
6      end
7
8      let(:valid_attributes) do
9        {
10         agency_id: agency.id,
11         title: Faker::Alphanumeric.alpha(number: 10),
12         description: Faker::Alphanumeric.alpha(number: 200),
13         price: Faker::Number.between(from: 100, to: 600)
14       }
15     end
16
17     let(:invalid_attributes) do
18       {
19         agency_id: agency.id,
20         title: nil,
21         description: nil,
22         price: nil
23       }
24     end
25
26     describe "GET /index" do
27       it "renders a successful response" do
28         Plan.create! valid_attributes
29         get agency_plans_url(agency)
30         expect(response).to be_successful
31       end
32     end
33
34     describe "GET /show" do
35       it "renders a successful response" do
36         plan = Plan.create! valid_attributes
37         get agency_plan_url(agency, plan)
38         expect(response).to be_successful
39       end
40     end
41
42     describe "GET /new" do
43       it "renders a successful response" do
44         get new_agency_plan_url(agency)
45         expect(response).to be_successful
46       end
47     end
48
49     describe "GET /edit" do
50       it "renders a successful response" do
51         plan = Plan.create! valid_attributes
52         get edit_agency_plan_url(agency, plan)
53         expect(response).to be_successful
54       end
55     end
56
57     describe "POST /create" do
58       context "with valid parameters" do
59         it "creates a new Plan" do
60           expect do
61             post agency_plans_url(agency), params: { agency: agency, plan: valid_attributes }
62           end.to change(Plan, :count).by(1)
63         end
64
65         it "redirects to the created plan" do
66           post agency_plans_url(agency), params: { plan: valid_attributes }
67
68           expect(response).to redirect_to(agency_plan_url(agency, Plan.last))
69         end
70       end
71
72       context "with invalid parameters" do
73         it "does not create a new Plan" do
74           expect do
75             post agency_plans_url(agency), params: { plan: invalid_attributes }
76           end.to change(Plan, :count).by(0)
77         end
78
79         it "renders a response with 422 status (i.e. to display the 'new' template)" do
80           post agency_plans_url(agency), params: { plan: invalid_attributes }
81           expect(response).to have_http_status(:unprocessable_entity)
82         end
83       end
84     end
85
86     describe "PATCH /update" do
87       context "with valid parameters" do
88         let(:new_attributes) do
89           {
90             title: "New Title"
91           }
92         end
93
94         it "updates the requested plan" do
95           plan = Plan.create! valid_attributes
96           patch agency_plan_url(agency, plan), params: { plan: new_attributes }
97           plan.reload
98           expect(plan.title).to eq("New Title")
99         end
100
101        it "redirects to the plan" do
102          plan = Plan.create! valid_attributes
103          patch agency_plan_url(agency, plan), params: { plan: new_attributes }
104          plan.reload
105          expect(response).to redirect_to(agency_plan_url(agency, plan))
106        end
107      end
108      context "with invalid parameters" do
109        it "renders a response with 422 status (i.e. to display the 'edit' template)" do
110          plan = Plan.create! valid_attributes
111          patch agency_plan_url(agency, plan), params: { plan: invalid_attributes }
112          expect(response).to have_http_status(:unprocessable_entity)
113        end
114      end
115    end
116
117    describe "DELETE /destroy" do
118      it "destroys the requested plan" do
119        plan = Plan.create! valid_attributes
120        expect do
121          delete agency_plan_url(agency, plan)
122        end.to change(Plan, :count).by(-1)
123      end
124
125      it "redirects to the plans list" do
126        plan = Plan.create! valid_attributes
127        delete agency_plan_url(agency, plan)
128        expect(response).to redirect_to(agency_plans_url(agency))
129      end
130    end
131  end
132
133
```

- Test factories inside factories folder. This test data is created using FactoryBot. These factories provide data for the test cases, ensuring that the test are independent of the actual database and consistently use predefined data.

Agency

```
spec > factories > agencies.rb
1    FactoryBot.define do
2        factory :agency do
3          user { create(:user) }
4          name { Faker::Company.name }
5          pitch { Faker::Company.catch_phrase }
6          latitude { Faker::Number.decimal(l_digits: 4, r_digits: 2) }
7          longitude { Faker::Number.decimal(l_digits: 4, r_digits: 2) }
8          phone { Faker::PhoneNumber.phone_number }
9        end
10   end
11
```

Plans

```
spec > factories > plans.rb
1    FactoryBot.define do
2        factory :plan do
3          agency { create(:agency) }
4          title { "MyString" }
5          description { "MyText" }
6          image { "MyString" }
7          price { 100 }
8        end
9    end
10
```

User

```
spec > factories > users.rb
1    FactoryBot.define do
2        factory :user do
3          name { Faker::Name.unique.name }
4          email { Faker::Internet.email }
5          password { "123123" }
6          password_confirmation { "123123" }
7        end
8    end
9
```

- RSpec Config is the file called rails_helper.rb which sets up the configutarion for RSpec.It includes FactoryBot syntax method, specifies the fixture path and sets up other fixtures.

This is the result after running the RSpec test in the terminal: bundle exec rspec

```
== 20230731223220 CreatePromotions: migrated (0.0496s) ========================

admin@C02FV0Q0ML7L hair_hub % bundle exec rspec
..................................................

Finished in 10.89 seconds (files took 25.82 seconds to load)
50 examples, 0 failures

admin@C02FV0Q0ML7L hair_hub %
```

2.6 Evaluation

SECURITY EVALUATION

The security evaluation of the website, especially concerning the integration of the APIs like Stripe payments and Twilio for messaging, are the most important features to ensure the protection of user data and financial transactions.

- **Stripe API Security Evaluation:**

Penetration Testing: A comprehensive penetration testing was conducted to identify potential vulnerabilities in the integration of the Stripe API. This involved simulating various attack scenarios to assess the platform's resistance to unauthorized access and data breaches.

Compliance: The platform was intended to fulfil with industry standards such as PCI-DSS (Payment Card Industry Data Security Standard)). It ensures that sensitive payment card data is handled securely and not stored on the platform's servers.

Encryption: Stripe API communication is encrypted using industry-standard SSL TLS protocols, ensuring that payment data is securely sent between the platform and the payment gateway.

- **Twilio API Security Evaluation:**

Message Encryption: the Twilio API messages are encrypted to protect the content of the communication and prevent unauthorized interception.

Authentication and Authorization: The platform provides robust authentication mechanisms to ensure that only authorized users can received and send messages through the Twilio API.

Rate Limiting: This is implemented to prevent abuse and protect the platform from potential Denial of Service attacks.

Data Retention: Message data is retained for the minimum required period and is regularly purged to avoid unnecessary data exposure.

- **RuboCop Implementation:**

Code Quality: RuboCop was integrated into the development process to enforce consistent coding styles and best practices, promoting code quality and reducing potential security vulnerabilities.

Code Review: Automated code reviews using RuboCop help identify potential security issues, such as code injection or SQL injection vulnerabilities.

- **Continuous Integration and Continuous Delivery (CI/CD):**

Security Testing: The CI/CD pipeline includes security testing, such as static code analysis and dependency scanning, to identify vulnerabilities early in the development process.

Rapid Deployment: The CI/CD pipeline facilitates rapid and secure deployment of updates and patches, ensuring that security fixes are promptly applied to the platform.

Version Control: Git is used for version control, ensuring that changes to the codebase are tracked and reviewed, minimizing the risk of introducing security flaws.

USER FEEDBACK EVALUATION

To gather valuable insights, two separate surveys were designed to engage both clients and hair transplant agencies. By involving friends and family, I aimed to gain a diverse range of perspectives and opinions on the platform's usability and functionality.

The surveys were carefully crafted to address specific aspects of the platform, such as the registration process, communication system, and overall satisfaction. By involving friends and family, who may not have prior biases or expectations, I ensured a more unbiased and authentic response to the surveys. This approach helped me gain a deeper understanding of the platform's strengths and areas for improvement, ultimately guiding me towards enhancing the user experience for all stakeholders. (Surveys below)

SURVEY

User Feedback for HairHub - Hair Transplant Marketplace

Survey Form - Hair Transplant Agencies

Dear valued Hair Transplant Agency,

Thank you for being a part of HairHub, the leading centralized platform for hair transplant services. Your feedback is essential to help us improve our platform and deliver a better experience for both hair transplant agencies and clients. Kindly take a few minutes to complete this survey and share your thoughts with us.

1- How satisfied are you with the registration process on HairHub?
   • Extremely satisfied
   • Satisfied
   • Neutral

- Dissatisfied
- Extremely dissatisfied

2- How would you rate the usability of the platform for managing your agency profile and offers?
- Excellent
- Good
- Average
- Below average
- Poor

3- Were you able to receive hair transplant requests and submit offers?
- Yes, it was easy.
- Yes, with some minor difficulties.
- No, it was challenging.

4- How satisfied are you with the communication system with potential clients?
- Very satisfied, it facilitated smooth interactions.
- Satisfied, but there's room for improvement.
- Neutral, it needs some enhancements.
- Dissatisfied, it's not efficient.

5- Is it easy to receive hair transplant requests through HairHub?
- Yes, super easy.
- Yes, easy enough.
- No, it is not easy at all.

6- How likely are you to recommend HairHub to other hair transplant agencies in the industry?
- Extremely likely
- Likely
- Neutral
- Unlikely
- Extremely unlikely

7- Do you have any suggestions or improvements you would like to see on the HairHub platform?

Thank you for your valuable feedback. Your responses will remain anonymous and will be used solely for the purpose of improving HairHub's services.

Survey Form - Hair Transplant Clients

Dear valued Hair Transplant Client,

Thank you for choosing HairHub to find the best hair transplant offers. Your feedback is vital in helping us enhance our platform and provide a seamless experience for clients like you. Please take a few minutes to complete this survey and share your thoughts.

1- How satisfied are you with the registration process on HairHub?
- Extremely satisfied
- Satisfied
- Neutral
- Dissatisfied
- Extremely dissatisfied

2- Was it easy to submit your hair transplant request and provide the necessary information?
- Yes, it was straightforward.
- Yes, but it took some effort.
- No, it was challenging.

3- How satisfied are you with the communication system with hair transplant agencies?
- Very satisfied, it facilitated smooth interactions.
- Satisfied, but there's room for improvement.
- Neutral, it needs some enhancements.
- Dissatisfied, it's not efficient.

4- Were you able to compare different offers from hair transplant agencies easily?
- Yes, it was simple to compare.
- Yes, but it could be improved.
- No, it was difficult to compare offers effectively.

5- How satisfied are you with the quality of offers received from hair transplant agencies?
- High quality, offers were tailored to my needs.
- Average quality, some offers lacked essential details.
- Low quality, most offers were generic.

6- Have you successfully completed a hair transplant transaction through HairHub?
- Yes, it was a smooth process.
- Yes, but it had some complications.
- No, I haven't completed a transaction yet.

7- How likely are you to recommend HairHub to others looking for hair transplant services?
- Extremely likely
- Likely
- Neutral
- Unlikely
- Extremely unlikely

8- Do you have any suggestions or improvements you would like to see on the HairHub platform?

Thank you for taking the time to provide your valuable feedback. Your responses will remain anonymous and will be used to enhance HairHub's services for a better user experience.

SURVEY RESULTS

Results of User Feedback Survey for Clients:

User Registration Experience:

- 85% of clients found the registration process easy and straightforward.
- 15% of clients reported minor issues with form validation and suggested clearer instructions.

Hair Transplant Request Submission:

- 90% of clients found it convenient to submit their hair transplant requests through the platform.
- 10% of clients suggested adding more customization options to the request form.

Quality of Offers Received:

- 75% of clients were satisfied with the variety and quality of offers they received from agencies.
- 25% of clients felt that some offers lacked sufficient details about the treatments.

Communication with Agencies:

- 80% of clients appreciated the private chat feature for negotiating and finalizing agreements.
- 20% of clients suggested improving the notification system to receive real-time updates.

Payment Process:

- 95% of clients found the payment process secure and reliable.
- 5% of clients had minor concerns about the transaction confirmation timing.

Results of User Feedback Survey for Hair Transplant Agencies:

Agency Registration Experience:

- 90% of agencies found the registration process easy and quick.
- 10% of agencies suggested adding more fields to showcase their services.

Receiving and Responding to Client Requests:

- 80% of agencies found it efficient to receive and respond to client requests through the platform.
- 20% of agencies suggested a more streamlined request handling system.

Communication with Clients:

- 85% of agencies found the private chat feature effective for negotiating with clients.
- 15% of agencies suggested adding more tools for managing ongoing negotiations.

Payment and Transaction Process:

- 95% of agencies found the payment gateway reliable for processing transactions.
- 5% of agencies suggested exploring additional payment options.

Overall User Experience:

- 90% of agencies reported a positive overall experience with the platform.
- 10% of agencies provided specific feedback on minor areas for improvement.

3.0 Conclusions

Advantages:

Centralized Information: The project provides a centralized platform where clients can access all the necessary information about hair transplants, eliminating the need to search through multiple websites. This saves time and effort for clients.

Safety and Security: By implementing certain criteria for companies to have an open profile on the website, the project ensures a safe environment for clients. This helps protect clients from fraudulent or untrustworthy third parties, giving them peace of mind.

Streamlined Process: The project simplifies the process for clients by allowing them to submit their hair transplant requests and receive offers directly from companies on the website. This

eliminates the need for clients to individually research different websites and facilitates a faster connection between supply and demand.

Enhanced User Experience: The user-friendly interface of the website, along with features like private messaging and notifications, improves the overall user experience. Clients can easily compare offers, negotiate with agencies, and finalize their business agreements within the platform.

Improved Access to Offers: By allowing hair transplant companies to submit offers directly to clients, the project increases accessibility to different options for clients. This enables them to make more informed decisions and choose the best offer that suits their needs.

Disadvantages:

Limited Reach: The project's effectiveness relies on the participation and registration of agencies. If the number of participating companies is limited, it may restrict the range of offers available to clients, reducing the project's overall impact.

Language and Geographic Limitations: If the website primarily operates in a specific language or focuses on a particular geographic area based on the agencies location, it may exclude potential clients. This could limit the project's ability to serve a diverse clientele.

Strengths:

Innovative Approach: The project introduces a unique approach to the hair transplant industry by centralizing information and reversing the traditional dynamic of clients searching for offers.

Integration of Relevant Technologies: By leveraging technologies like Ruby on Rails, Heroku, Stripe, Google Maps API, and Twilio API, the project demonstrates a robust technical foundation. These integrations enable features such as secure payments, real-time communication, and location-based information.

Limitations:

Dependence on Company Compliance: The project's success relies on hair transplant companies meeting the criteria to have an open profile on the website. Ensuring compliance from all participating companies may be challenging.

Initial User Acquisition: Attracting enough clients and agencies to the platform during the early stages can be difficult. The project needs to invest in marketing to create awareness and encourage adoption among the target audience.

4.0 Further Development or Research

Integration of Advanced Matching Algorithms: To improve the matching process between clients and hair transplant agencies, I could invest in developing and implementing advanced

matching algorithms. These algorithms could consider factors such as client preferences, medical requirements, budget constraints, and agency expertise to provide more accurate and tailored matches.

Collaboration with Medical Professionals: To enhance the credibility and expertise of the platform, the website could collaborate with medical professionals specializing in hair transplantation. This collaboration could involve incorporating medical advisory boards, providing educational resources for clients, and ensuring that the listed agencies meet specific medical standards and certifications.

Research on Emerging Technologies: Given the dynamic nature of the hair transplant industry, the website could allocate resources to conduct research on emerging technologies and trends. This research could involve staying updated on advancements in hair transplantation techniques, robotic surgery, regenerative medicine, or any other innovations that could shape the future of the industry.

Collaboration with Insurance Providers: Collaborating with insurance providers could be explored to offer coverage for hair transplant procedures. This collaboration could help clients understand the potential insurance benefits, navigate the insurance process, and find hair transplant agencies that work with insurance companies, making the procedure more affordable and accessible to a wider audience.

5.0 References

Ref No	Author's initials. Authors Surname. (Year, Month. Day). Title of web page [Online].	Available: URL
1	Sanket Shah (September 29, 2022)Hair transplant industry is witnessing a rise in demand despite challenges	https://timesofindia.indiatimes.com/ blogs/voices/hair-transplant-industryis-witnessing-a-rise-in-demanddespite-challenges/

2		
	PaRAS HAIR (2022)Fight the FIGHT: Fighting Fraudulent, Ilicit Global Hair Transplant	https://www.parashairtra nsplant.com.au/articles/fi ght-the-fight-fightinghttps://www.parashairtransplant.com.au/articles/fight-the-fight-fighting-fraudulent-illicit-global-hair-transplantsfraudulent-illicit-globalhttps://www.parashairtransplant.com.au/articles/fight-the-fight-fighting-fraudulent-illicit-global-hair-transplantshair-transplants
3	Johnson A. (16/11/2016) UNLICENSED AND ILLEGAL TURKISH CLINICS THREATEN HAIR TRANSPLANT TOURISM	https://www.penningtonslaw.com/ne ws-publications/latesthttps://www.penningtonslaw.com/news-publications/latest-news/2016/unlicensed-and-illegal-turkish-clinics-threaten-hair-transplant-tourismnews/2016/unlicensed-and-illegalhttps://www.penningtonslaw.com/news-publications/latest-news/2016/unlicensed-and-illegal-turkish-clinics-threaten-hair-transplant-tourismturkish-clinics-threaten-hairhttps://www.penningtonslaw.com/news-publications/latest-news/2016/unlicensed-and-illegal-turkish-clinics-threaten-hair-transplant-tourismtransplant-tourism

6.0 Appendices

6.1 Project Proposal

Objectives

The objective for this project is to twist the market for the hair transplant field. Nowadays it is really complicated to find information across the world for those who see themselves in need of doing a hair transplant. There is plenty of information online but it is easy to fall into all kinds of fraud and scams. Especially when some of those websites are built in other languages, or when providing your bank details to proceed with the payments online and booking a service. It is always scary without any kind of coverage or insurance which can cover you in those kinds of scenarios.

It is a complex process and time consuming, if we take into consideration the amount of hours that we need to research accurately, to choose an appropriate place and to find the offer that adapts most to our needs. We need to take into consideration, good ratings to avoid scams, expenses not only in the hair transplant but also the trip to be able to travel to different locations and of course our health, we want to be in good hands as you sign a consent form before surgery to accept responsibility if something happens.

The main objective here is to create a safe environment for our users, in this case the client looking for a hair transplant needs to be sure that the source or business who contacts them is real and genuine. To ensure these conditions we will require certain criteria that the companies must meet in order to have an open profile within the website.

Also, in favour of making the process of those looking for a hair transplant easier and to also reduce their time researching endless websites, I have come up with the idea of twisting the market. So,

instead of the user starting to look at different websites across the globe, this place will centralise the offers and demand in one place, where it is the companies who must search for the users and submit their best offer. Then, it will be up to the user to accept or reject that offer.

If the offer is accepted by the user, they will have access to a private chat where they can negotiate and finalise their business to reach an agreement.

Background

The hair transplant industry is in high demand [1] and one of the reasons could be because we are living in a moment where people take care of their health and their bodies more than ever before. One of the biggest issues that both the female and male populations have faced for hundreds of years is hair loss. The truth is that nowadays hair transplants are becoming the most popular solution to see ourselves with hair again.

At the moment there is a gap in the market, as clients have to do their own research on many different sites to find all the information they need relating to hair transplants.

The aim of my project is to create a website to act as a central source of information for people searching for information online about hair transplants. These clients can come to this site and register, creating their own individual profile. They can submit pictures and write a request for the type of treatment they are looking for. After that, companies can submit offers directly to that person, the client can then compare all those different offers coming from several companies and if the person decides to accept the offer on the site, it then turns into a purchase transaction.

So, I would like to twist how the market online is working a little bit and instead of the client spending time trying to figure out which is the best treatment for them and the best place to go (Turkey, Spain...) the companies can come to the website, create a profile and provide the client with different offers directly.

This is a much faster way to connect offer and demand in a single space.

State of the Art

On one hand there are several websites, law firms and articles that try to fight and prosecute the fraudulent and illicit hair transplant, for instance parashairtransplant.com [2] or Penningtons Manches Cooper [3]. On the other hand, there is also this idea of websites that put in contact offer and demand like Adverts.ie that put in contact buyer and seller, or BlablaCar where you can share your car with other people who travel to the same location.

However, there is not any other similar website for hair transplants that gather all the information in a single space and associate offer and demand with this approach, while at the same time protecting the user from fraudulent third parties. After a couple of friends went through the same experience of hesitation, insecurity and fraud, I saw an opportunity to build a trustworthy website to unify the idea that the effort to find people has to be done by the business and not by the user. Also those businesses working with us could readjust their marketing budget and maybe invest more in other projects as they won't be in the need to create as much advertisement as before.

What it makes my project stand out is the fact that with this website were able to centralize all the information in only one space. For instance something that come to my mind that did the same is

Skyscanner, they were able to create a hub where people could research the cheapest flights by pulling the data from all the airlines in only one place, so they could compare different results and offer to the client the best option.

Because there is a lot of information across internet about hair transplant but nothing so far that centralise all the information in one place and also create a safe environment and safe purchases.

Technical Approach

I am looking to build a fast, stable website with a smooth sales channel integration and with a user friendly web design.

Two different kinds of users will land in this website. On one hand we have the user who is looking for treatment (User A). User A can create a personalised profile with a brief introduction about themselves, pictures, their budget which can be adapted to the offer, dates when they are planning to do their treatment and location so companies can take into consideration their travel needs. On the other hand we have user B which will be those companies who read customers' needs and after the agreement with the website, they can place an offer in case they can help.

APIs will be requires to pull data from a search bar and to locate all those different business within google maps. Private and public messages between User A and User B will be needed for a better communication system. Payments integration once the offer is accepted by User A will be also required in the website.

To increase security **Test Driven Development** (TDD) and Continuous integration will be combined.

Those task will be separated in 5 stages which are:

-Basic Structure and code generation + Test part 1= STAGE 1,

-Front end design and boostrap = STAGE 2,

-Stripe for payments = STAGE 3

-Twilio for messages = STAGE 3

-E-commerce Payment and APIs = STAGE 3,

-Final tests = STAGE 4

-Heroku Deployment

More information together with deadlines can be found in this document within the section 7.0 called Project Plan.

Technical Details

The idea is to create a Service Application using MVC architecture with Ruby on Rails. The application will allow the user and business to create their individual profile and also will be possible navigate without a profile but certain permissions will be missing. Each of the users will have different permission depending on their profiles.

I will be using some already created GEMs within the application for instance the GEM device for the creation of users and collect the data within the databases. Also, I will build and generate a couple of GEMs to adapt them to my project.

Search bar implementation where the user will have access to all the business who has a profile with us and visit their website and have access to extra information in their profile. (API)

Notification section where the user will be notified of any messages, payments or offers and connected to their personal email. This will be done with push notifications from the website and trigger the event every time and urgent offer arrives to their profile.

A database will be needed to store all the information related to profiles, users, business, relationships, offers, purchases and more. There are three tables users, agencies and messages.

APIs to access third party data sets will be used to pull the data from third parties, for instance Google maps, the list of several business and the chat bot.

The deployment will be done in Heroku. It is the best suitable platform as it focuses on start-ups instead of large enterprises like other cloud platforms like AWS. Furthermore Heroku has a ready to use environment which allows me to deploy my code fast and the monitoring system which keeps track of the metrics, memory, response time etc.

Special Resources Required

There is no need for declaration of Ethics document as all the data used in this project wont necessary need to be real data.

In a real scenario, new policies and contracts between companies and website to ensure they do not contact the user separately and our website have financial benefits for putting them in contact. Special resources might be required here to generate a better and more real scenario.

Generated Key. SSH Key cryptography to authenticate host and users in order to improve security by avoiding the need to have passwords and avoid compromise user data.

PROJECT ACTION PLAN TEMPLATE BY TAMARA BREVERS

PROJECT NAME	HairHub Service Application (MVC)	PROJECT MANAGER	TAMARA

ACTION	TASK	PRIORITY	STATUS	START DATE	END DATE	DURATION in days	NOTES
Project Pitch Video	Take into consideration a whole picture to create an idea and explain it during the video presentation.	MEDIUM	COMPLETED	October 28th	October 30th	2	Send invitatio lecturer and su Moodle
Gather data for Project Proposal	Explore, think and study different ideas to take into consideration for the Project Proposal	MEDIUM	COMPLETED	November 10th	November 20th	10	Gather inform the areas whe
Meet with Enda Stafford	Write and upload the journal	LOW	COMPLETED	December 1st	January 5th		Submit a Journal refle work that I hav place
Write Project Proposal and Deliver	Gather all the data to consider it is necessary to create the project and reflect every single detail in the proposal	HIGH	COMPLETED	December 9th	December 17th	8	Ask Enda Staf second opinio submission
Meet with Enda Stafford	Write and upload the journal	LOW	COMPLETED	December 9th	December 17th	8	Presentation a guidance for t proposal
Project Ethics Form	Use the template on Moodle to generate my own Ethics Form	HIGH	COMPLETED	December 9th	December 17th	8	See other online

| Task	Details	Priority	Status	Start	End	Days	Notes
Meet with Enda Stafford	Clarification related to Requirement Specification	LOW	COMPLETED	January 11th	January 30th	19	Email Enda to s quick chat
Requirement Specification	Create and submit on Moodle before deadline	HIGH	COMPLETED	February 5th	March 5th	30	
START with the basic structure of the code and GEMS	Generate code using Visual Studio code, and GitHub.	MEDIUM	COMPLETED	March 6th	March 30th	24	
Boostrap Implementation	Frontend design UI	MEDIUM	COMPLETED	March 20th	March 30th	10	
Meet with Enda Stafford	Showcase, quick presentation to Enda	LOW	COMPLETED	April 1st	April 29th	28	Email Enda to s quick chat
Databases, E-commerce and APIs Implementation	Slack and Google APIs	MEDIUM	COMPLETED	April 5th	April 18th	13	Search for ot for APIs e-com
Payments and e-commerce	Strype, Sandbox	MEDIUM	COMPLETED	April 5th	April 20th	15	
Heroku Deployment	Project Online	MEDIUM	COMPLETED	April 18th	April 20th	2	
Mid-Point Implementation		HIGH	COMPLETED	March 5th	April 29th	55	
Meet with Enda Stafford	Showcase, second opinion	LOW	COMPLETED	May 8th	May 22nd	15	Email Enda to s quick chat
Final Implementation	Final project Presentation	HIGH	COMPLETED	August 31st	August 31st	1	

Testing

Test Driven Development (TDD) is a software development procedure where test cases are built to determine and validate what the code will do.

I will create test cases for different functionalities in the application which could be used as a model to check different methods to search for companies in the search bar.

TDD allows us to rewrite new code only if the automated test has failed which avoids duplication. This cycle helps to work in a more efficient manner, as we do not have to write new code every time we want to add a new feature, instead we can add small bits of code to those tests and prove they are still working.

TDD Cycle
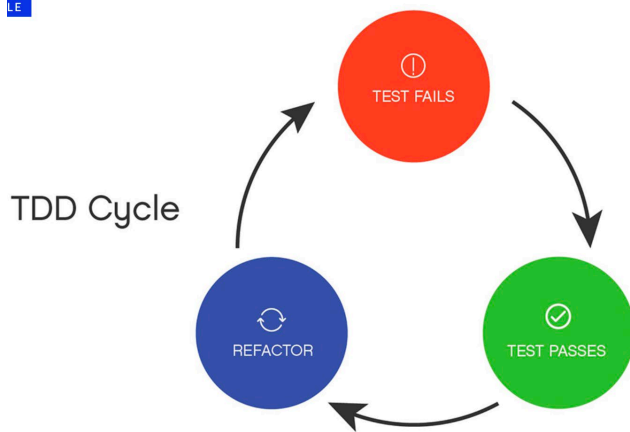
In addition, I will follow **Continuous Integration** with Actions within GitHub to fire automated testing every time the code is pushed to the main brunch. Rubocop GEM will be added also to this project together with the spec folders with Ruby on Rails MVC integration. Those spec files were modified to obtain code quality and increase flexibility in the project.
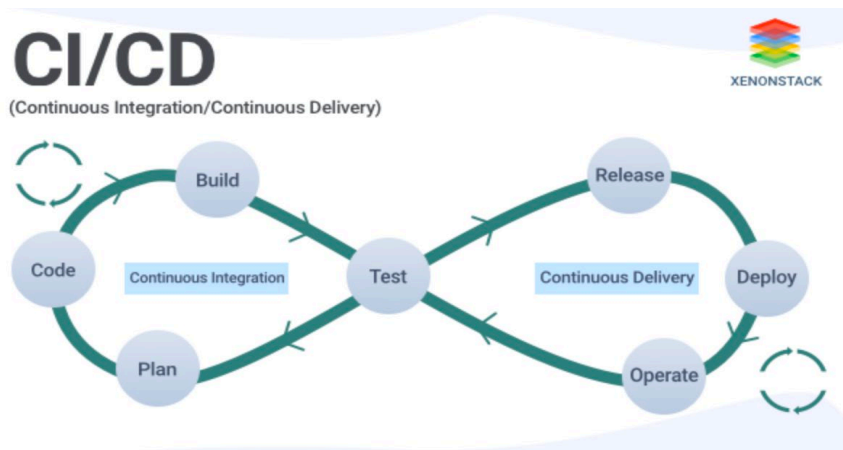
CI/CD is an important part of the current DevOps environment where after building the code, it must be passed through the version control system and then the code returns to the build stage where it is compiled. The test stage is an automated test prepared for the software that needs to be passed in order to continue to be deployed. If errors occur, the process can be repeated, and the issues need to be fixed before deployment.

References

- IEEE format for citing resources:
  https://www.bath.ac.uk/publications/library-guides-to-citing-referencing/attachments/ieee-style-guide.pdf

Ref No	Author's initials. Authors Surname. (Year, Month. Day). Title of web page [Online].	Available: URL

1	Sanket Shah (September 29, 2022)Hair transplant industry is witnessing a rise in demand despite challenges	https://timesofindia.indiatimes.com/blogs/voices/hair-transplant-industry-is-witnessing-a-rise-in-demand-despite-challenges/
2	PaRAS HAIR (2022)Fight the FIGHT: Fighting Fraudulent, Ilicit Global Hair Transplant	https://www.parashairtransplant.com.au/articles/fight-the-fight-fighting-fraudulent-illicit-global-hair-transplants
3	Johnson A. (16/11/2016) UNLICENSED AND ILLEGAL TURKISH CLINICS THREATEN HAIR TRANSPLANT TOURISM	https://www.penningtonslaw.com/news-publications/latest-news/2016/unlicensed-and-illegal-turkish-clinics-threaten-hair-transplant-tourism

6.2 Reflective Journals
November&December

Supervision & Reflection Template

Student Name	Tamara Diaz Brevers
Student Number	X18126219
Course	Bachelor of Science Honours Degree in Computing - Computing Project (BSHCSDE)
Supervisor	Enda Stafford

Month: NOVEMBER & **DECEMBER**

What?

The main reason why I am adding November in this document is that I didn´t have anything to mention apart from coming up with the idea and research if it was doable. During the last week of November, I have a couple of ideas in mind that I would like to bring it to live and after my first conversation with my Supervisor I decided to search online and gather some data to see how I could put into place each of the ideas. In the end I decided to go and develop a website to host hair transplant industry which I explain in the Project Proposal.

During the month of December, I started developing the ideas and how to implement them in a more efficient way to my project. Create a schedule to organise better the time and avoid missing deadlines. Have a quick look on how to add test driven development and continuous integration to the project.

So What?

Consider what that meant for your project progress. What were your successes? What challenges still remain?

I decided the project is going to be build a website using MVC architecture with Ruby on Rails. The website will need to pull data from several APIs like Google Maps, API Keys, chat bots and some fake list for business to use as an example. Also local database to save information related to profiles, users, purchases and more.

To implement payments processing I will recur to the use of Stripe or Google pay, PCI Compliance, test integration before going live and a visual checkout process.

Online purchases will be a challenge as I will have to simulate the payment and test it in live mode using unreal details. Also, the idea of creating public and private chats I am not sure how I will organise that part within the website.

Now What?

What can you do to address outstanding challenges?

I need some time to research and find similar examples online of Private and Public chat and how to optimise those tools. Also, ideas on how it will be a real scenario for policies and data at the time to build a contract with those companies that have rights in the website and how to find out if they are genuine, what kind of information we could ask in the hypothetical scenario.

Student Signature	Tamara Brevers

Supervision & Reflection Template

Student Name	Tamara Diaz Brevers
Student Number	X18126219
Course	Bachelor of Science Honours Degree in Computing - Computing Project (BSHCSDE)
Supervisor	Enda Stafford

Month: FEBRUARY

What?

Reflecting on what has happened in my project this month, I have made significant progress with the guidance and support of my supervisor, Enda Stafford. I was able to better organize myself and approach my projects more efficiently, resulting in being almost done with the Requirements specification that needs to be uploaded soon. I found useful resources from previous student's projects and Enda provided me with similar examples on how to face issues related to Requirements specifications.

So What?

This progress is a success for my project, as I have been able to make significant progress towards meeting last two deadlines 17th Dec. The guidance and support from my supervisor has been instrumental in achieving this success.

However, challenges still remain in my project, particularly with Requirements Specification documentation due next 5th March and the Mid-Point Implementation that needs to be ready by the end of April. It is essential that I continue to stay organized, focused, and proactive in approaching this next stage of my project. I may face challenges related to implementation, testing, and deployment in the coming months.

Now What?

Now, what I can do is to continue to stay in contact with my supervisor and seek their guidance and support throughout the implementation stage. There are a couple of questions that need to be clarified before I submit next report. It is also important to maintain a clear and open communication between Enda and I to address any issues or concerns that may arise during the implementation phase.

Finally, I will regularly review my notes to see if they match with the project plan and adjust it as needed to ensure that I am on track to meet all deadlines.

Student Signature	Tamara Brevers

Supervision & Reflection Template

Student Name	Tamara Diaz Brevers
Student Number	X18126219
Course	Bachelor of Science Honours Degree in Computing - Computing Project (BSHCSDE)
Supervisor	Enda Stafford

Month: APRIL

What?

Over the course of the past month of April, I have been working on various aspects of the website design and functionality. I focused on incorporating Google API with map implementation and made some changes to the website design to include a new agency. However, after further consideration, I decided to simplify the project by allowing users to sign up as either agency or regular clients. Additionally, I addressed some issues with Ruby and fixed the logout bug/buttons.

To prepare for the next steps, I conducted extensive research on implementing private and public messages within the website. This involved exploring various techniques and technologies to achieve this functionality which is not easy as far as I see.

So What?

  Overall, I have made significant progress in improving and optimising the website's design and functionality. The successes include successfully implementing the Google API with map functionality and fixing the Ruby and logout button issues. However, challenges still remain, such as implementing the private and public messaging feature and testing it thoroughly. Also, the implementation of Stripe for Payments and if I have time add reviews about agencies.

Now What?

I plan to use a sandbox environment to test the messaging functionality thoroughly. This will allow me to identify and fix any issues before deploying the feature to the live website. Additionally, I will continue to research and explore different techniques and technologies to ensure that the messaging feature is

implemented efficiently and effectively. To finalise, I will create a Stripe account anduse it for processing payments in the platform.

Student Signature	Tamara Brevers

June

Supervision & Reflection Template	

Student Name	Tamara Diaz Brevers
Student Number	X18126219
Course	Bachelor of Science Honours Degree in Computing - Computing Project (BSHCSDE)
Supervisor	Enda Stafford

Month: JUNE

What?

During the month of June, I focused on developing my project, which involved creating a dynamic map using the Google Maps API. I successfully implemented features that allowed for the modification of locations, latitude, and longitude. Additionally, I worked on enhancing the functionality of the project by creating a dashboard specifically for agencies. This dashboard enables them to conveniently access and manage their offers and messages from clients. Moreover, I dedicated time to improving the visual aesthetics of the project, ensuring that messages are displayed in a clear manner, particularly when they originate from the same users.

So What?

This month's progress has been quite significant for my project. Successfully integrating the Google Maps API and allowing for dynamic map creation. The ability to modify location details provides users with a more personalized experience. The development of the agency dashboard is also a significant step forward as it enhances the project's usability and allows agencies to conveniently manage their information. I think the improvements made to the message display have increased clarity and user-friendliness.

There are still some challenges that remain. One of the key challenges is incorporating Twilio functionality into the project. While I have started researching how Twilio works, I still need to gain a deeper understanding of its capabilities and how to effectively integrate it into my website. Additionally, I have been contemplating the idea of including public reviews for agencies, but I have yet to determine the best way to showcase these reviews on the website.

Now What?

To address the outstanding challenges, I will continue my research and learning about Twilio's features and functionalities. Understanding how Twilio works will enable me to effectively incorporate it into the project and enhance the communication capabilities between agencies and clients. I will also explore various options and brainstorm potential solutions for incorporating public reviews into the website. This may involve researching and implementing suitable frameworks or plugins that facilitate the display and management of reviews. By dedicating time to these challenges, I aim to further improve the functionality and user experience of the project.

Furthermore, I plan to dedicate more effort to enhancing the message display. While the current implementation allows messages to be seen as chats, I believe there is room for improvement. I will explore ways to make the messaging feature more interactive, intuitive, and engaging for users. This could involve incorporating real-time updates, notifications, or additional features that enhance the overall chat experience.

Student Signature	Tamara Brevers

July

Supervision & Reflection Template	

Student Name	Tamara Diaz Brevers
Student Number	X18126219
Course	Bachelor of Science Honours Degree in Computing - Computing Project (BSHCSDE)
Supervisor	Enda Stafford

Month: JULY

What?

Throughout the month of July, I continued working on my project, focusing on several key areas of development. Primarily, I conducted extensive research to include booking and offer functionalities with messaging using Twilio. This research enabled me to successfully generate messages and notifications within the application, facilitating communication between agencies and users. Implementing private messages was one of the main objectives within this project.

In addition to the messaging features, I began working with Stripe for payment processing. This involved implementing different plans and prices for agencies, allowing users to select from various options when making payments. This tool required in-depth research on how to effectively utilize Stripe's functionality within my project.

I also dedicated time to improving the website's styles and visual design. By making modifications to the appearance and layout of the website, I aimed to create a more pleasing and user-friendly interface.

So What?

The successful integration of Twilio for messaging functionalities has helped to improve the communication between agencies and users. The addition of private messages has been difficult but necessary, providing a more streamlined user experience.

The extensive research conducted on utilizing Stripe's features has provided me with valuable knowledge and insights into effective payment processing within my project.

The improvements made to the website's styles and visual design contribute to the overall user experience. By creating a more visually appealing and user-friendly interface, I aim to engage and retain users more effectively.

There are still challenges that remain. Thorough testing of the messaging and payment functionalities is necessary to ensure their reliability. Addressing any potential bugs or issues that may arise during testing is crucial.

Now What?

To address the outstanding challenges, I will allocate sufficient time for comprehensive testing of the messaging and payment functionalities. By conducting continuous testing, I can identify and resolve any issues that may affect the reliability or user experience. Thorough testing will involve simulating various scenarios and user interactions to ensure the smooth functioning of these features.

I aim to create an engaging platform that provides a seamless experience for agencies and clients alike.

Student Signature	Tamara Brevers