



COMP9900 23T3

Information Technology Project

Final Report

P23 Web Platform for Connecting Professionals with Projects

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Overview

Introduction

The current global economic landscape is witnessing a significant shift from traditional, full-time employment to a more dynamic, project-based work model (Lau, 2021). This change is driven by mutual benefits for both businesses and professionals. Skilled individuals are increasingly drawn to engaging, rewarding projects that allow them to develop their skills and earn income. Concurrently, businesses are on the lookout for specialized talent for efficient project completion. However, despite this mutual need, a critical communication gap remains (Bragin, 2018). The lack of a dedicated, intuitive platform impedes effective connections between companies with projects and professionals seeking them. This gap results in missed opportunities, project delays, and underutilization of talent, highlighting the need for a solution that facilitates more effective collaboration in this evolving work environment.

Relevant Systems

Current systems endeavour to mitigate this communication barrier with various levels of effectiveness. Websites like Upwork and Freelancer serve as platforms where individuals can bid on company posted projects. However, these platforms have their shortcomings which are identified as follow:

Upwork

- **Competitive Bidding Systems:** Upwork operates on a bidding model, which often results in a race to the bottom where professionals often underbid each other in order to participate in the projects they want to join. This adversely affects the earning potential for professionals and undermines the quality of work on the side of companies.
- **High Fees:** The platform charges a significant portion of the freelancer's earnings as service fees, which diminishes the financial appeal for both the professionals and the companies, making the platform less welcoming for both parties.

Freelancer

- **Lack of Professional Vetting:** Freelancer's platform does not have a rigorous vetting process or system to validate the qualifications and expertise of individuals profiles. This lax vetting may potentially lead to companies hiring less qualified individuals. Thus, affecting the quality and period of projects being delivered. Moreover, it may also create trust issues between companies and project workers.
- **Generic Project Listings:** Project listings on Freelancer often lack the requisite details, making it a herculean task for professionals to understand the project requirements fully. Similarly, companies find it challenging to attract the right talent due to inadequate project descriptions.

These shortcomings highlight the need for a more efficient platform with rigorous vetting, and detailed project listings to enhance the quality of project-based work and interactions between companies and professionals.

Problem Statement

This project aims to develop a web-based platform for connecting professionals with real-world projects to address the above identified problems in the existing systems. The proposed platform will focus on creating a streamlined, user-friendly interface where companies can post projects with clear, comprehensive listings, and professionals can showcase their expertise through vetted profiles. By addressing the drawbacks of existing systems, this platform will foster a conducive environment for fruitful collaborations between companies and professionals. Therefore, bridging the existing communication gap in the project-based work domain.

System Architecture

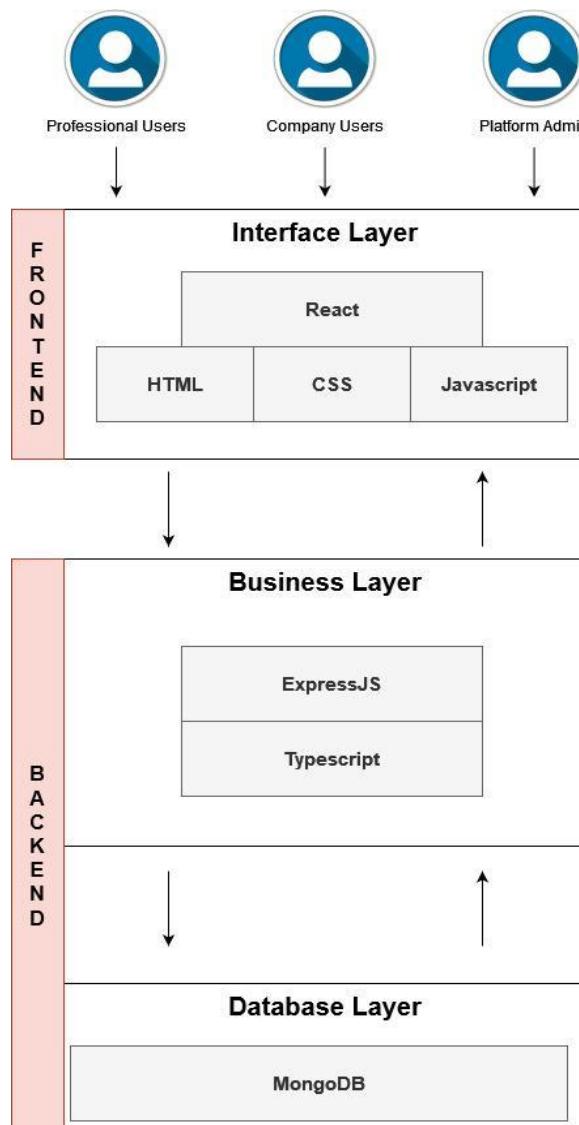


Figure 1: System Architecture

The external actors in the proposed system along with technologies/languages that will be used to develop the proposed system can be seen in the system diagram above and will be further explained in the next subsections.

System Architecture Layers

Interface Layer

The interface layer, also known as the frontend, is the user-facing segment of our platform. It is where users directly interact with and view the platform's content. This layer will manifest as a website comprising various pages.

For its development, we are employing core frontend technologies: HTML, JavaScript, and CSS. Additionally, we're integrating React, a popular library that offers a range of built-in functionalities. React's capabilities enable us to create high-quality user interfaces more efficiently, enhancing the overall user experience. Next JS framework, which works on top of React, is applied in the application to provide ease in navigating.

Business Layer

The business layer plays a crucial role in our platform, serving as the hub for all business logic and functionalities. This includes core operations that allow both professional users and company users to interact with the platform. It acts as a vital intermediary, bridging the frontend layer with the database layer. In this capacity, it retrieves data from the database for frontend use and updates the database according to frontend requests.

For the implementation of this layer, we have chosen to use the Express web framework in conjunction with TypeScript. Express is our framework of choice due to its extensive range of HTTP utility methods and middleware, which significantly streamlines API development. Additionally, we opted for TypeScript over JavaScript for its enhanced features and type safety. This choice is aimed at minimizing errors, thereby ensuring more robust and reliable code.

Database Layer

Our platform's data layer is pivotal in managing all data-related operations. We have chosen MongoDB, a NoSQL database, for its flexibility and scalability. MongoDB's role is multifaceted — it is tasked with creating, updating, and retrieving data as requested by the business layer. This includes handling not just textual data, but also file-based data like PDFs and images.

Within this database, three primary models are utilized: the Project model, the User model, and the Ratings model.

Project Model: This model is essential for capturing the intricacies of each project, encompassing details such as the owner's ID, project title, start and end dates, and other relevant specifics.

```

1  _id: ObjectId('655188321de699a951587efe')
2  owner: 655187ca1de699a951587ef4
3  project_title: "Software engineer intern"
4  tags: Array (1)
5  description: "Design an e-commerce website"
6  start_date: 2023-11-09T00:00:00.000+00:00
7  end_date: 2023-11-18T00:00:00.000+00:00
8  No_professional: "10"
9  expected_working_hours: "60"
10 skills: "React JS"
11 experiences: "Web development internship"
12 online_offline: "online"
13 price_budget: "50"
14 req_prof_criteria: "Good group collab skills"
15 status: "completed"
16 potential_applicants: Array (empty)
17 approved_applicants: Array (1)
18 0: 655189211de699a951587f20
19 invited_applicants: Array (empty)
20 createdAt: 2023-11-13T02:21:38.802+00:00
21 updatedAt: 2023-11-13T02:30:29.139+00:00
22 __v: 2

```

Figure 2: Project Model

User Model: Tailored to represent individual users, this model includes basic information like first and last names, company type, and other pertinent details. Importantly, the fields in this model are dynamic, adapting based on the user's company type. For instance, company users have an 'ABN' field, which is not applicable to professional users.

```

_id: ObjectId('654dc5aeffd3c3e793fa9c1a')
userType: "professional"
firstName: "John"
email: "john@example.com"
userName: "john_doe"
password: "password123"
description: "Experienced finance professional"
phoneNumber: "+1234567890"
dob: "1990-05-15"
socialURL: "https://linkedin.com/in/johndoe"
address: "123 Main Street, Cityville"
tags: Array (2)
  0: "Finance"
  1: "Investment Banking"

```

Figure 3: User model for Professional User

```

_id: ObjectId('654dc5aeffd3c3e793fa9c25')
userType: "company"
firstName: "Retail Excellence Corp."
email: "info@retailexcellence.com"
userName: "retail_excellence"
password: "retailpass987"
phoneNumber: "+3344556677"
socialURL: "https://linkedin.com/company/retailexcellence"
abn: "11223344556"
address: "101 Main Street, Shopville"
tags: Array (3)
  0: "Retail"
  1: "Sales"
  2: "Customer Service"

```

Figure 4: User model for Company User

Ratings Model: Each instance within this model is a detailed record of a rating made on the platform. It includes crucial elements such as the userId, projectId, the actual rating value, and any reviews associated with project ratings. This structured approach ensures efficient and organized data management, catering to the diverse needs of our platform's functionality.

```

1  _id: ObjectId('654dcecd28c979091e3f2619')
2  userId: 654dce8328c979091e3f2611
3  projectId: 654dcc6c28c979091e3f25dc
4  ratings: 1
5  ratingType: "Company"
6  review: "This project is very interesting"
7  __v: 0

```

Figure 5: Ratings Model

User Types (External Actors)

Professional Users

- Skilled Individuals or Professionals that are registered to the platform in order to search and join projects that are posted by companies in the platform.
- Only interacts with the system through the Frontend component in which the Frontend component will fetch or make changes to the data in the backend component based on the user action.

Company Users

- Individuals from a company who use the platform to post their projects in order to find skilled individuals who are suited and willing to work on their projects.
- Similar to the Professional Users, the company users also only interact with the system through the Frontend component where data will be fetched or changed in the backend component through the frontend component based on the user action.

Platform Admin

- The platform administrator who is responsible for managing and overseeing the platform.
- Similar to the other two types of users, the platform administrator will interact with the system through the frontend component only.
- Unlike the other two users, the administrator will have a higher editing/manipulating power on the data in the backend system.

Functionalities

User Types Summary (For User Stories)

- **Visitor:** A new user who has never visited the website before and is currently not registered to the website.
- **User:** A current user with different roles who is currently registered to the website. (Admin/Company/Professional)
- **Company User:** Individuals belonging to a company that post projects from their company onto the website to find skilled individuals to join and work on the project.
- **Professional User:** A skilled individual that is looking for projects to join into on the website.
- **Admin User:** Website Administrator that manages and oversees the website.

Epic Stories

1. Login and registration
2. View/edit profile
3. Feed categorisation and filtering
4. Company project management
5. View/edit individual project
6. Project application
7. Notification
8. Project completion
9. Admin system control

User Stories

Our application has 9 main functionalities/objectives. Below are user stories mapped to each functionality with the acceptance criteria also outlined under each story. All user stories have been defined in Jira including the priority based on 1 Low, 3 Medium, and 5 High story points.

All/Common Users

ID	1
Feature	Login and registration
User Story	As a visitor , I want to be able to view an introduction of the website, so that I can decide if I want to register and explore further.
Acceptance Criteria	Given that I have on the landing page, when I scroll around the page, then I will be able to view descriptions and features provided in the platform.
Priority	High (1 Low, 3 Medium, 5 High)
Justification	Process: When a visitor opens the Connected website, it will load an introduction of the platform and the services it provides. They can proceed to register an account or login to their existing account by clicking on either the login or register button.

ID	2
Feature	Login and registration
User Story	As a visitor , I want to be able to choose either a company or professional account, so that I can access the right services from the website.
Acceptance Criteria	Given that I have not registered before, when I am in the process of signing up, then I will have to choose either a company user or a professional user.
Priority	High (1 Low, 3 Medium, 5 High)
Justification	Process: When a visitor decides to register an account with Connected, they will click the register button at the landing page. Afterwards, they will be directed to the registration page and are given two options: company account or professional account. The visitor can click on either option to set up the appropriate account for the website.

ID	3
Feature	Login and registration
User Story	As a visitor , I want to register an account by filling in the required information depending on the user type, so that I can access the website/app and its services
Acceptance Criteria	Given that I am a company user type, when I click the register button, then I will have to fill in a form consisting of username, password, name, address, ABN, industry type, company website, email, phone number, and a brief description. Given that I am a professional user type, when I click the register button, then I will have to fill in a form consisting of username, password, name, address, email, Date of Birth, phone number, LinkedIn link.
Priority	High (1 Low, 3 Medium, 5 High)
Justification	Process: After choosing to register either a company or professional account, a form will be given for the user to fill in their details that are required. Once filled in, they will be directed to the home page and have created an account that can be used for future purposes.

ID	4
Feature	Login and registration
User Story	As a user , I want to login with my credentials, so that I can interact and use the website's services for my own needs.
Acceptance Criteria	Given that I have registered an account, when I visit the application again, then I will have to login to access the application's features and my details.
Priority	High (1 Low, 3 Medium, 5 High)
Justification	Process: In the landing page, users who have an existing account can log in by clicking the login button and then entering their email and password. If the user forgets their password, they can click on the forget

	password button after entering their email. Else, if their credentials are correct, they will be directed to the home page.
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ID	5
Feature	Login and registration
User Story	As a user , I want to be able to logout, so that I can protect my account from unauthorized access.
Acceptance Criteria	Given that I have logged in my account, when I click the Logout button, then I will no longer be able to access my details and the application's features.
Priority	High (1 Low, 3 Medium, 5 High)
Justification	Process: After a user has successfully logged in or registered an account, they will be able to logout from the website by simply clicking the logout button in the menu when they click on the profile icon on the top navigation bar.

ID	6
Feature	Login and registration
User Story	As a user who forgets their password, I want to receive a temporary password via <u>email</u> , so that I can <u>login</u> into my account again.
Acceptance Criteria	Given that I am trying to login to my account, when I click the forget password button, then I will receive a temporary password.
Priority	Medium (1 Low, 3 Medium, 5 High)
Justification	Process: When a user forgets their password, the user can click forget password and the system will utilise email automation. Email Content: The user receives an email containing a temporary password. Action: The user can log in using the temporary password provided in the email. After logging in, they are prompted to change the temporary password to a new secure one.

ID	7
Feature	View/edit profile
User Story	As a user , I want to be able to view my profile, so that I can ensure all my information is up-to-date and correct.
Acceptance Criteria	Given that I have logged in to my account, when I click on my profile, then I will be directed to another page with my personal details.
Priority	High (1 Low, 3 Medium, 5 High)
Justification	Process: After a user has successfully logged in or registered an account, they will be able to view their profile by simply clicking the 'Your Profile' button in the menu when they click on the profile icon on the top navigation bar.

ID	8
Feature	View/edit profile
User Story	As a user , I want to be able to edit my profile, so that I can update my information.

Acceptance Criteria	Given that I am on my profile, when I click the edit button, then I will be able to change my personal details.
Priority	High (1 Low, 3 Medium, 5 High)
Justification	Process: After clicking the 'Your Profile' button in the menu when they click on the profile icon on the top navigation bar, users will be directed to their profile page and be able to edit their details by clicking the edit button. A form with their current information can be changed and once finished editing, they can click a button to save the changes.

ID	9
Feature	View/edit profile
User Story	As a user , I want to be able to change my password, so that I can protect my account.
Acceptance Criteria	Given that I am on my profile, when I click the change password button, then I will be able to change my password.
Priority	Low (1 Low, 3 Medium, 5 High)
Justification	Process: After clicking the 'Edit Profile' button in their profile page, a form with their current information will appear as well as a 'Change Password' button. If the button is clicked, a modal will appear with a simple instruction to have a strong password and form for the user to fill in their new password and password confirmation.

ID	10
Feature	Login and registration
User Story	As a visitor , I want to be able to choose relevant industry tags, so that I can get better recommendations.
Acceptance Criteria	Given that I am creating an account, when I have chosen either a company or a professional user, then I will be able to choose tags to specify the industry I am interested in.
Priority	High (1 Low, 3 Medium, 5 High)
Justification	Process: After choosing to register either a company or professional account, a form will be given for the user to fill in their details that are required such as choosing an industry that they are interested/working in. They would be able to change this when editing their profile.

Company Users

ID	11
Feature	Company project management
User Story	As a company user , I want to be able to create a new project post, so that professionals can apply for my project.
Acceptance Criteria	Given that I have logged in as the company, when I have a new project, then I will create a new project post to publicize it. Project posts may include project title, tags, description, start and end date, number of professionals, expected working hours, skills, experiences, online/offline, price/budget, required criteria/information from professionals when they're applying.
Priority	High (1 Low, 3 Medium, 5 High)

Justification	Process: After successfully registering or logging in as a company user, they will be directed to the home page. Action: Users can click the “+ New Post” button at the top navigation bar to create a new project post. Once clicked, they will be directed to a page with a new project form that the user has to fill in.
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ID	12
Feature	Company project management
User Story	As a company user , I want to be able to view my project lists and its details, so that I can ensure all the information is up-to-date.
Acceptance Criteria	Given that I have logged in, when I click the My Projects button, then I will be directed to another page with all my projects.
Priority	High (1 Low, 3 Medium, 5 High)
Justification	Process: After successfully registering or logging in as a company user, they will be directed to the home page. Action: Users can click the “My Project” to view their new, ongoing, old/completed projects in that page if there are projects created before. They will be able to view more details about the project by clicking on a project card.

ID	13
Feature	Company project management
User Story	As a company user , I want to be able to filter my project lists, so that I can easily find which projects are new, ongoing or completed.
Acceptance Criteria	Given that I have posted projects, when I am at My Projects page, then I can see the list of each project, and what status are they currently at
Priority	High (1 Low, 3 Medium, 5 High)
Justification	Process: After successfully registering or logging in as a company user, they will be directed to the home page. Action: Users can click the “My Project” to view their new, ongoing, old/completed projects in that page if there are projects created before. In each section, there is a search bar and a filter toggle that allows users to find certain projects easily. Hence, providing a better user experience, convenience and efficiency for users.

ID	14
Feature	Feed categorisation and filtering
User Story	As a company user , I want to be able to view a list of professionals, so that I can invite them to apply for the company’s project.
Acceptance Criteria	Given that I am the home page, when I click on the Professional header button, then I will be directed to another page with all the professionals registered in the platform.
Priority	High (1 Low, 3 Medium, 5 High)

Justification	<p>Process: Company users can find professionals on the platform at the home page or by clicking the highlighted ‘Professional’ word at the home page to view all of the available professional users.</p> <p>Action: Company users can invite a professional user by clicking on the professional card to view their profile. There is a ‘Hire Professional’ button on the Professional’s profile page. Users will be able to choose which project they want to invite the professional to work in.</p> <p>The invite feature can help the company users find and invite professionals who have the skills, experience, and interest to work on their project. The feature can also help the company user expand their network and reach more potential candidates for their project.</p>
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ID	15
Feature	View/edit profile
User Story	As a company user , I want to be able to view a professional’s profile, so that I can inspect if they are suitable for the company.
Acceptance Criteria	Given that there is a professional card on the page, when I click on it, then I will be directed to another page containing the professional’s profile.
Priority	High (1 Low, 3 Medium, 5 High)
Justification	<p>Process: Company users can find professionals on the platform at the home page or by clicking the highlighted ‘Professional’ word at the home page to view all of the available professional users.</p> <p>Action: Company users can invite a professional user by clicking on the professional card to view their profile.</p> <p>The professional card and the profile page can help the company user inspect if the professional is suitable for the company and their project based on their qualifications, skills, and experience. This provides a better user experience and satisfaction by offering easy methods to gain more insights and information. By being able to view a professional’s profile, the company user can enhance their decision and quality.</p>

ID	16
Feature	Project application
User Story	As a company user , I want to be able to send an invite to a professional, so that they can work on my project.
Acceptance Criteria	Given that I am viewing a professional’s profile page, when I think that they would be a good candidate for the project, then I can click a button to send them an invite to join.
Priority	High (1 Low, 3 Medium, 5 High)

Justification	<p>Process: When a company invites a professional to join a project, the system triggers an email automation process.</p> <p>Email Content: The professional receives an invitation email stating that they have been invited to join a specific project. The email includes details about the project and provides a link for the professional to manually apply.</p> <p>Action: The professional can click on the provided link, which redirects them to the project application page where they can submit their application.</p>
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ID	17
Feature	Company project management
User Story	As a company user , I want to be able to edit my project lists and its details, so that I can ensure all the information is correct.
Acceptance Criteria	Given that I am at a page with all the details of my project, when I click on the edit button, then I can start editing the project's information.
Priority	High (1 Low, 3 Medium, 5 High)
Justification	<p>Process: After clicking the “My Project” button on the navigation bar, company users will be directed to a page with all their projects.</p> <p>Action: Users can click on a certain project card to view the project's details. There is an edit button that allows the user to make any adjustments or improvements to the project based on their needs and preferences. Hence, providing a better user experience by offering the company users more control and flexibility over their data.</p>

ID	18
Feature	View/edit individual project
User Story	As a company user , I want to be able to view professionals who have requested to work on my project, so that I can approve or reject them.
Acceptance Criteria	Given that I am at a page with all the details of my project, when I scroll down the page, then I can view all professionals that have applied to work on the project.
Priority	High (1 Low, 3 Medium, 5 High)
Justification	<p>Process: After clicking a certain project card to view the project's details, there will be a section containing all of the professionals that are invited by the company, professionals who applied to join the project, and those who are already accepted to work in the project.</p> <p>Action: Users can approve or reject the professionals that have applied to join the project by clicking on the approve or reject button on each professional card. This allows the company to control who will be working for the project which determines the quality and efficiency of the work produced.</p>

ID	19
Feature	View/edit individual project
User Story	As a company user , I want to be able to view the professionals who are approved to join a project, so that I can ensure that the list is correct.
Acceptance Criteria	Given that I am at a page with all the details of my project, when the project has started, then I can view all professionals that have been approved for the project.
Priority	High (1 Low, 3 Medium, 5 High)
Justification	<p>Process: After clicking a certain project card to view the project's details, there will be a section containing all of the professionals that are invited by the company, professionals who applied to join the project, and those who are already accepted to work in the project.</p> <p>Action: Users can remove the accepted professionals by clicking on the remove button on each professional card. This allows the company to control who is working for the project which determines the quality and efficiency of the work produced.</p>

ID	20
Feature	Project completion
User Story	As a company user , I want to be able to mark a project as completed, so that I can rate and recognise the professionals involved.
Acceptance Criteria	Given that I am at a page with all the details of my project, when the project has completed, then I can mark it as completed and begin rating the professionals involved.
Priority	High (1 Low, 3 Medium, 5 High)
Justification	<p>Process: When a project is completed, company users will mark the project as completed.</p> <p>Action: After clicking a certain project card to view the project's details, the company user can mark a project as completed by clicking on the 'Mark Completed' button. By doing so, company users indicate that they have achieved their desired outcome and that they are satisfied with the project.</p>

ID	21
Feature	Project completion
User Story	As a company user , I want to be able to rate the professional users who contributed to the project, so that they can receive recognition for completing the project.
Acceptance Criteria	Given that I am at a page with all the details of my project, when the project has been marked completed, then I can rate each professional involved using a 5 star rating and give some remarks on their contribution.
Priority	Medium (1 Low, 3 Medium, 5 High)
Justification	<p>Process: After clicking a certain project card to view the project's details, the company user can mark a project as completed by clicking on the 'Mark Completed' button.</p>

	Action: Company users can give ratings and reviews for each professional user and their contribution to express their gratitude and evaluation. The rating and review can also help the professional users improve their skills and reputation by learning from the company user's perspective and opinion.
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ID	22
Feature	Feed categorisation and filtering
User Story	As a company user , I want to view and filter the available project lists, so that I can find the projects aligned to my enquiry.
Acceptance Criteria	Given that I have logged in. when I am at the home page, then I can view and filter the public projects available.
Priority	High (1 Low, 3 Medium, 5 High)
Justification	<p>Process: After successfully registering or logging in, company users can view other available projects on the website.</p> <p>Action: Company users view and filter the available projects from the home page or at the “/projects” page by clicking on the highlighted “Projects” word.</p> <p>The list and the filter option can also help the company user learn from other companies’ experiences and best practices by viewing their projects. By being able to view and filter the available project lists, the company user can enhance their knowledge and business opportunities.</p>

Professional Users

ID	23
Feature	Feed categorisation and filtering
User Story	As a professional user , I want to be able to view all available projects, so that I can start finding projects to apply for.
Acceptance Criteria	Given that I have logged in. when I am at the home page, then I can view all the public projects available.
Priority	High (1 Low, 3 Medium, 5 High)
Justification	<p>Process: After successfully registering or logging in, professional users can view other available projects on the website.</p> <p>Action: Professional users can view and filter the available projects from the home page or at the “/projects” page by clicking on the highlighted “Projects” word.</p> <p>The project list can help the professional users find projects that suit their interests, skills, and goals. The list can also help the platform attract and retain more professional users by offering them a variety of projects and opportunities. By providing this list, professional users can enhance their chances and career prospects.</p>

ID	24
Feature	Feed categorisation and filtering
User Story	As a professional user , I want to be able to search through available projects, so that I can find projects that align with my interests.
Acceptance Criteria	Given that I have logged in. when I am at the home page, then I can filter the projects available based on tags.
Priority	High (1 Low, 3 Medium, 5 High)
Justification	<p>Process: Professional users can view all available projects at the “/projects” page by clicking on the highlighted “Projects” word found in the home page.</p> <p>Action: The search bar and the filter option can help the professional users find projects that align with their interests, goals, and abilities. This option can also help the professional user save time and effort by showing them only the relevant and suitable projects. A better user experience is provided as professional users have more choices and flexibility.</p>

ID	25
Feature	View/edit individual project
User Story	As a professional user , I want to be able to select a certain project, so that I can view the full details of the project.
Acceptance Criteria	Given that I am browsing for a project, when I click on a project card, then I will be directed to another page with the project’s details.
Priority	High (1 Low, 3 Medium, 5 High)
Justification	<p>Process: Professional users can view available projects at the “/projects” page by clicking on the highlighted “Projects” word found in the home page or by browsing projects that are posted by the companies.</p> <p>Action: Professional users can click on a project’s card to view its details such as the description, requirements, start and end date, and budget.</p>

ID	26
Feature	Project application
User Story	As a professional user , I want to be able to request to join a project, so that I can work on it.
Acceptance Criteria	Given that I am at a project page, when I click the apply button, then I can submit my application to do the project.
Priority	High (1 Low, 3 Medium, 5 High)
Justification	<p>Process: Professional users can click on a project’s card from the home page, a company’s profile, or the “/projects” page.</p> <p>Action: After clicking on a project’s card to view its details, professional users can request to join the project by clicking the “Join Project” button. The application is sent to the company and the professional user can track its progress on the platform. By being able to</p>

	request to join a project, the professional user can enhance their career opportunities and growth.
--	---

ID	27
Feature	Project application
User Story	As a professional user , I want to receive a confirmation of my project request, so that I know the application was sent successfully.
Acceptance Criteria	Given that I have finished filling the project application, when I click the submit button, then I will receive a confirmation saying my application has been sent.
Priority	Low (1 Low, 3 Medium, 5 High)
Justification	<p>Process: After a professional applies for a project, the system automatically sends a confirmation email.</p> <p>Email Content: The confirmation email acknowledges that the professional's application has been successfully received. It may include additional details about the project and the next steps in the application process.</p> <p>Action: The professional is informed that their application is in process, providing reassurance and keeping them updated on the status.</p>

ID	28
Feature	Notification
User Story	As a professional user , I want to receive a notification if my request has been accepted or rejected, so that I know when to start to work on the project.
Acceptance Criteria	Given that I have applied to work on a project, when the company is going through the project's applications, then I will receive an email based notification system to see the outcome for my application.
Priority	Medium (1 Low, 3 Medium, 5 High)
Justification	<p>Process: When a decision is made regarding a professional's application or participation in a project, the system initiates an email automation sequence.</p> <p>Email Content:</p> <ul style="list-style-type: none"> - Approval: If approved, the professional receives an email notifying them that they have been accepted to join the project. - Rejection: If rejected, the professional is informed via email about the decision and may receive feedback or instructions for improvement. - Removal: In case a professional is removed from a project because of their poor performance, an email is sent notifying them of their removal and potentially explaining the reasons. <p>Action: The professional can act accordingly based on the email received, such as preparing to join the project (if approved) or addressing concerns raised in case of rejection.</p>

ID	29
Feature	Project completion
User Story	As a professional user , I want to rate my experience working on the project once it is completed, so that I can provide feedback and insight on the company for other users.
Acceptance Criteria	Given that the company user has marked the project as completed, when I am at the project page, then I can rate my experience by giving a remark and the 5 star rating.
Priority	Medium (1 Low, 3 Medium, 5 High)
Justification	<p>Process: After a company user marks a project as completed, all of the professionals involved in that project can give ratings and reviews.</p> <p>Action: Professional users will rate their experience working on the project on a scale of one to five stars. The rating and review are also sent to the company as feedbacks and insight on their performance and quality, which updates that company average rating based on their average across all projects.</p>

ID	30
Feature	Project completion
User Story	As a professional user , I want to be able to receive a certificate of recognition from the company, so that I can build my account and prove that I have completed the project.
Acceptance Criteria	Given that I have contributed to the project, when the company has marked the project as completed, then I will receive a certificate of recognition from the company.
Priority	High (1 Low, 3 Medium, 5 High)
Justification	<p>Process: When a professional user completes a project, the professional user can download a certificate of recognition.</p> <p>Action: At a completed project page, besides the rating section, professional users can view, print, or share the certificate of recognition as they wish after they have downloaded it.</p>

ID	31
Feature	View/edit profile
User Story	As a professional user , I want to be able to view my list of completed projects and reviews, so that I can keep track of my previous works.
Acceptance Criteria	Given that I have worked on projects, when I am at my profile page, then I can view my list of completed projects and reviews at the lower part of the page.
Justification	<p>Process: After successfully registering or logging in as a professional user, they will be directed to the home page.</p> <p>Action: Users can click their profile to view their list of completed projects and reviews. The list shows the name, description, duration, and rating of each project that the professional user has worked on.</p>

ID	32
Feature	View/edit profile
User Story	As a professional user , I want to be able to have the option to upload supplementary documents such as PDF of my resume, experiences, tags, and a biography, so that I can substantiate my qualifications, skills, and expertise.
Acceptance Criteria	Given that I am at my profile page, when I click the edit button, then I can upload and include more information.
Priority	High (1 Low, 3 Medium, 5 High)
Justification	<p>Process: After clicking the ‘Your Profile’ button in the menu when they click on the profile icon on the top navigation bar, users will be directed to their profile page and be able to edit their details by clicking the edit button.</p> <p>Action: Professional users can upload supplementary documents such as their resume in PDF format, by clicking on the “Add CV” button, then or choosing the file to upload.</p>

ID	33
Feature	View/edit profile
User Story	As a professional user , I want to be able to view a company’s profile, so that I can learn more about the company and view their available projects.
Acceptance Criteria	Given that I have logged in, when I click on a certain company, then I will be directed to its profile page.
Priority	High (1 Low, 3 Medium, 5 High)
Justification	<p>Process: Professional users can find companies on the platform at the home page or by clicking the highlighted ‘Companies’ word at the home page to view all of the available company users.</p> <p>Action: Professional users can click on a company’s card to view their profile, which contains information such as the company’s description, contact details, ratings, and available projects that they can request to join.</p>

Admin Users

ID	34
Feature	Admin system control
User Story	As an admin , I want to have full privilege of the system, so that I can manage and oversee the platform.
Acceptance Criteria	Given that I have the admin role, when I enter in my correct account credentials, then I can log in to the platform.
Priority	High (1 Low, 3 Medium, 5 High)
Justification	<p>Process: An admin can take similar actions like the other users. The admin has control to remove projects or registered users if they are inappropriate or unacceptable for the platform.</p>

ID	35
Feature	Admin system control
User Story	As an admin , I want to be able to see overall statistics, so that I can observe the platform's performance.
Acceptance Criteria	Given that I have logged in, when I am at the home page, then I can observe the overall statistics of the application. Statistics include number of ongoing projects per year, number of completed projects per year, number of professional users, number of company users, number of total projects per year.
Priority	High (1 Low, 3 Medium, 5 High)
Justification	Process: When an admin logs in to the platform, the admin's home page displays various statistics such as the number of projects, the project based on tags, projects that are ongoing, and statuses of the overall project. By having access to overall statistics, the admin can enhance their management and leadership skills.

Frontend Functionalities Implementation

The website application effectively illustrates all nine functionalities specified in the epic stories. A detailed explanation for each functionality is provided below, accompanied by corresponding screenshots of the user interface, as mentioned in the Appendix section of this report.

Login and registration

Appendix 1.1 shows the layout when a visitor first visits the Connected website. It consists of an introduction of the platform and also register and login buttons. When the visitor clicks on either of those buttons, they will be directed to the corresponding page. If the visitor decides to create an account on the platform, they will go through the registration process (Appendix 1.3.1- 1.3.3).

View/edit profile

Once a user has successfully registered or logged in to an account, they will be able to view and edit their profile to make sure that it contains the latest information. To view their profile, they can access it by clicking on the “Your Profile” button found at the top navigation bar (Appendix 2.1). Then, users will be directed to their profile page where they can click on the “Edit Button” to edit their profile (Appendix 2.2 & Appendix 2.3).

Feed categorisation and filtering

For both Company and Professional Users, their Homepage is structured similarly for code usability (Appendix 3.1.1 & Appendix 3.1.2). For each section on the page, there is a section header with a highlighted word that is clickable. The mouse cursor would change when users hover those words. If the user proceeds to click any of those words, they will be directed to the corresponding page with all the available projects or companies or professionals (Appendix 3.2 - 3.4).

Project management

At the top navigation bar, users can click on the “My Project” button to view all of their projects. For Professional users, they will view projects that they have applied to, invited by companies, currently joined, and completed projects (Appendix 4.1). On the other hand, for Company users, they will view their projects that are new, currently ongoing, and completed (Appendix 4.2). When a company decides to add a new project in the platform, they will need to click on the “+ New Project” button found at the top navigation bar. Appendix 4.3 demonstrates the form that Company users have to fill in when creating a new project.

View/edit individual project

Once a company user created their projects, they will be able to view and edit each project. When a project card is clicked, they will be directed to a page containing the project’s details and buttons to modify the project (Appendix 5.1 & Appendix 5.2).

Project application

As mentioned in the user stories, Company users can invite professionals to join their project. Appendix 6.1.1 - 6.1.2 illustrates the process when a company user wants to invite a professional. Meanwhile, Appendix 6.2 shows how a Professional user can join a project.

Notification

When Professional users are invited or requested or approved to join a project, they will receive email messages in the email that they have registered with on the platform (Appendix 7.1 - 7.3).

Project completion

When a project is completed, the Company user will mark the project as completed to update the project status and proceed to the rating and reviewing process. The Company user will provide ratings for the Professional users and vice versa (Appendix 8.1 & Appendix 8.2). Professional users will be able to receive a certificate of recognition for contributing to the project.

Admin system control

When an Admin user logs into the Connect website, charts displaying the system’s statistics can be found in the Homepage (Appendix 9).

Project Sprints

In the beginning of the project, we populated the Jira's backlog with all user stories. The project was segmented into three two-week sprints. The first sprint, from September 25th to October 9th, was dedicated to crafting initial pages and basic features for Professional and Company users. The second sprint, from October 9th to October 23rd, focused on developing the web application's main features. Finally, the third sprint, from October 23rd to November 6th, aimed at adding features to enhance user experience.

Sprint 1

SCRUM Sprint 1 25 Sep – 9 Oct (12 issues)		0	0	60	Complete sprint	...
<input checked="" type="checkbox"/> SCRUM-21	As a company user, I want to be able to view my project lists and its details, so that I can e...	COMPANY PROJECT ...	DONE	5	ST	
<input checked="" type="checkbox"/> SCRUM-20	As a company user, I want to be able to create a new project post, so that professionals ca...	COMPANY PROJECT ...	DONE	5	ST	
<input checked="" type="checkbox"/> SCRUM-14	As a user, I want to be able to logout, so that I can protect my account from unauthorized a...	LOGIN AND REGISTRA...	DONE	5	ST	
<input checked="" type="checkbox"/> SCRUM-19	As a visitor, I want to be able to choose relevant industry tags, so that I can get better reco...	LOGIN AND REGISTRA...	DONE	5	ST	
<input checked="" type="checkbox"/> SCRUM-24	As a company user, I want to be able to view a professional's profile, so that I can inspect i...	VIEW/EDIT PROFILE	DONE	5	ST	
<input checked="" type="checkbox"/> SCRUM-23	As a company user, I want to be able to view a list of professionals, so that I can invite the...	FEED CATEGORISATI...	DONE	5	ST	
<input checked="" type="checkbox"/> SCRUM-32	As a professional user, I want to be able to view all available projects, so that I can start fin...	FEED CATEGORISATI...	DONE	5	ST	
<input checked="" type="checkbox"/> SCRUM-13	As a user, I want to login with my credentials, so that I can interact and use the website's s...	LOGIN AND REGISTRA...	DONE	5	ST	
<input checked="" type="checkbox"/> SCRUM-16	As a user, I want to be able to view my profile, so that I can ensure all my information is up-...	VIEW/EDIT PROFILE	DONE	5	ST	
<input checked="" type="checkbox"/> SCRUM-11	As a visitor, I want to be able to choose either a company or professional account, so that I ...	LOGIN AND REGISTRA...	DONE	5	ST	
<input checked="" type="checkbox"/> SCRUM-1	As a visitor, I want to be able to view an introduction of the website, so that I can decide if I ...	LOGIN AND REGISTRA...	DONE	5	ST	
<input checked="" type="checkbox"/> SCRUM-12	As a visitor, I want to register an account by filling in the required information depending on...	LOGIN AND REGISTRA...	DONE	5	ST	

Sprint 2

SCRUM Sprint 2 9 Oct – 23 Oct (12 issues)		0	0	60	Complete sprint	...
<input checked="" type="checkbox"/> SCRUM-17	As a user, I want to be able to edit my profile, so that I can update my information.	VIEW/EDIT PROFILE	DONE	5	NJ	
<input checked="" type="checkbox"/> SCRUM-25	As a company user, I want to be able to send an invite to a professional, so that they can w...	PROJECT APPLICATION	DONE	5	VJ	
<input checked="" type="checkbox"/> SCRUM-22	As a company user, I want to be able to filter my project lists, so that I can easily find whic...	COMPANY PROJECT ...	DONE	5	NJ	
<input checked="" type="checkbox"/> SCRUM-27	As a company user, I want to be able to view professionals who have requested to work on ...	VIEW/EDIT INDIVIDUA...	DONE	5	EL	
<input checked="" type="checkbox"/> SCRUM-28	As a company user, I want to be able to view the professionals who are approved to join a ...	VIEW/EDIT INDIVIDUA...	DONE	5	VJ	
<input checked="" type="checkbox"/> SCRUM-26	As a company user, I want to be able to edit my project lists and its details, so that I can en...	COMPANY PROJECT ...	DONE	5	EL	
<input checked="" type="checkbox"/> SCRUM-29	As a company user, I want to be able to mark a project as completed, so that I can rate and...	PROJECT COMPLETION	DONE	5	VJ	
<input checked="" type="checkbox"/> SCRUM-41	As a professional user, I want to be able to have the option to upload supplementary docu...	VIEW/EDIT PROFILE	DONE	5	NJ	
<input checked="" type="checkbox"/> SCRUM-33	As a professional user, I want to be able to search through available projects, so that I can ...	FEED CATEGORISATI...	DONE	5	NJ	
<input checked="" type="checkbox"/> SCRUM-31	As a company user, I want to view and filter the available project lists, so that I can find the ...	FEED CATEGORISATI...	DONE	5	NJ	
<input checked="" type="checkbox"/> SCRUM-42	As a professional user, I want to be able to view a company's profile, so that I can learn mo...	VIEW/EDIT PROFILE	DONE	5	EL	
<input checked="" type="checkbox"/> SCRUM-35	As a professional user, I want to be able to request to join a project, so that I can work on it.	PROJECT APPLICATION	DONE	5	VJ	

Sprint 3

SCRUM Sprint 3 23 Oct – 6 Nov (11 issues)		0	0	39	Complete sprint	...
<input checked="" type="checkbox"/> SCRUM-15	As a user who forgets their password, I want to receive a temporary password via email, so...	LOGIN AND REGISTRA...	DONE	3	VJ	
<input checked="" type="checkbox"/> SCRUM-18	As a user, I want to be able to change my password, so that I can protect my account.	VIEW/EDIT PROFILE	DONE	1	EL	
<input checked="" type="checkbox"/> SCRUM-30	As a company user, I want to be able to rate the professional users who contributed to the ...	PROJECT COMPLETION	DONE	3	EL	
<input checked="" type="checkbox"/> SCRUM-36	As a professional user, I want to receive a confirmation of my project request, so that I kno...	PROJECT APPLICATION	DONE	1	VJ	
<input checked="" type="checkbox"/> SCRUM-37	As a professional user, I want to receive a notification if my request has been accepted or r...	NOTIFICATION	DONE	3	VJ	
<input checked="" type="checkbox"/> SCRUM-38	As a professional user, I want to rate my experience working on the project once it is comp...	PROJECT COMPLETION	DONE	3	EL	
<input checked="" type="checkbox"/> SCRUM-39	As a professional user, I want to be able to receive a certificate of recognition from the co...	PROJECT COMPLETION	DONE	5	ST	
<input checked="" type="checkbox"/> SCRUM-40	As a professional user, I want to be able to view my list of completed projects and reviews,...	VIEW/EDIT PROFILE	DONE	5	NJ	
<input checked="" type="checkbox"/> SCRUM-34	As a professional user, I want to be able to select a certain project, so that I can view the f...	VIEW/EDIT INDIVIDUA...	DONE	5	ST	
<input checked="" type="checkbox"/> SCRUM-43	As an admin, I want to have full privilege of the system, so that I can manage and oversee t...	ADMIN SYSTEM CON...	DONE	5	NJ	
<input checked="" type="checkbox"/> SCRUM-44	As an admin, I want to be able to see overall statistics, so that I can observe the platform's...	ADMIN SYSTEM CON...	DONE	5	NJ	

Implementation Challenges

Backend Challenges

Authentication

Authentication is one of the most important features for our backend system which has to be implemented carefully to avoid potential pitfalls and vulnerabilities in order to safeguard the integrity and confidentiality of the data stored in the backend system. Additionally, it is also used for access control to ensure that only authorized users and entities can access the resources in the backend system.

When brainstorming which authentication system we should implement for the backend, JWT (JSON Web Token) was the first choice. It is a widely used session-based authentication and authorization system implemented in multiple applications. To implement the JWT authentication system to the backend system, we used the jsonwebtoken library from <https://www.npmjs.com/package/jsonwebtoken>. Upon a successful login to the backend system, the system will return a JWT token which they can use to authenticate themselves when calling access restricted APIs in the backend system. Each of the JWT tokens will expire automatically after 24 hours.

To identify the user based on the JWT token generated by the system, the backend team decided to include 3 fields into the JWT token payload which are the user's id, user's email, and the user's role. By doing this, we can use the JWT token to implement safeguarding or access control to the APIs in the backend system based on the user role. For example, a delete user API should only be used by an admin. Through the use of the JWT token, we can identify the user role from the token.

Additionally, the backend team also tackled one of the main weaknesses of the JWT authentication system which is its stateless nature. Once a JWT is issued, it remains valid until it expires. To solve this problem, the backend team created a collection inside the MongoDB database called tokens which is used to keep track of the active user tokens in the application. Thus, allowing the backend system to revoke a token if needed.

Pagination, Filtering and Sorting Projects and Users

Pagination is a technique used in web development to divide up large sets of data into smaller, more manageable sections or pages. Pagination is important as it allows the backend system to send large volumes of data or in case the list of users or projects in the system to the frontend in chunks or pages. Hence, improving performance massively and reducing the payload size compared to sending the whole data directly to the frontend. To mitigate this issue, a handy library called mongoose-paginate-v2 (<https://www.npmjs.com/package/mongoose-paginate-v2>) is used. This allows the backend to implement pagination to the users and projects efficiently. Additionally, filtering and sorting of the paginated data is handled through the use of powerful queries functionality provided by the MongoDB database itself.

Rating and Reviews

The rating and reviews feature of our platform is one of the most important elements that ensures an interactive engagement between professional users and companies. By having this feature, we can make sure that the users of the platform can hold each other accountable.

Since the rating can act as a credibility, a higher credit score implies a more significant chance of getting opportunities in our platform.

Given the dynamic nature of the rating feature where a user can receive multiple ratings by participating in different projects. A company's project can receive various ratings and comments from a wide range of participants. Our initial approach involved creating an array of ratings within our MongoDB schema. This schema includes 'User' and 'Project' objects, which store specific information about users and projects respectively. When rating API functions are called within the 'userController.ts' file, these objects are updated to reflect the latest ratings and reviews to ensure that the most current information is displayed on user and company profiles.

However, potential inefficiencies, such as the need to iterate through the rating array to calculate average ratings, were recognised when applying this method. It also obscured the link between which users rated which projects and vice versa. To address these issues, we introduced a dedicated 'Rating' MongoDB schema object. Each instance of this object encapsulates the details of a specific rating, including the userId, projectId, rating value, and reviews (for project ratings). This design simplifies the calculation of overall ratings for users or projects by allowing direct queries to MongoDB using the target userId or projectId. Therefore, enhancing efficiency and clarity in our rating system.

Average Ratings

In the previous section discussing ratings and reviews, we introduced the 'Rating' object which is designed to encapsulate all relevant details of a particular rating. Whenever a rating is submitted, it instantiates a new 'Rating' object, which is then stored in MongoDB.

To compute the average rating for a professional user, we employ the 'rateProfessionalUser' API function. This function operates by first gathering all instances of the 'Rating' object associated with the user's ID from MongoDB. It then calculates the average rating from these instances. Subsequently, this calculated average is updated in the 'User' object's 'averageUserRating' field. This process ensures that the most current average rating is readily accessible and displayed when someone views the professional user's profile.

To calculate a company's rating, our approach involves averaging the ratings of all projects associated with the company, identified by an 'ownerId'. This process is integrated into the 'rateProject' function and unfolds in two primary steps:

Project Rating Calculation: Initially, we obtained all the ratings linked to a specific project, identified by its 'projectId'. Using these ratings, we calculated the average rating for that particular project.

Company-Wide Average Rating: Next, we retrieved the 'ownerId' associated with the project to identify the company. With this 'ownerId', we located all projects under the same company. Then, we computed the overall average rating by considering the average ratings of all these projects. Finally, this cumulative average rating is used to update the 'averageCompanyRating' field in the corresponding 'User' object. With this method, it ensures a comprehensive and dynamic assessment of a company's rating based on the collective performance of its projects."

Frontend Challenges

Responsiveness

Responsiveness is a key feature of modern web applications, as it enables them to adapt to different screen sizes, resolutions, orientations, and input methods. Responsiveness enhances the user experience, satisfaction, engagement, as well as the performance and accessibility of web applications. However, achieving responsiveness may be a challenging task due to the variety of devices, browsers, platforms, and user types. To handle this, our group used Tailwind CSS. It uses a mobile-first breakpoint system, in which utility classes are applied from the smallest screen size and then progressively enhanced for larger screens. Large portions of the code created uses flex and grid which adjust themselves to fit into the user's screen. Another responsiveness challenge faced was the page rendering duration affected by using Next JS. Since Next JS provides a server rendering, it may result in longer loading of the website.

UI/UX

One of the challenges in designing a user-friendly interface is to evaluate its usability beyond its visual appearance. To address this problem, we decided to adopt the established design patterns offered by Tailwind CSS, a framework for building responsive and modern web interfaces. We also drew inspiration from other software products that have similar functionalities and goals, with the assumption that they have undergone rigorous user testing and evaluation. At every step of the development, we voice our opinions on how this particular item in the sprint would flow.

Usability

Usability is a crucial aspect of user experience design, as it measures how well a product or service can meet the needs and expectations of the users in a specific context. However, designing for usability is not a straightforward task. The interface has to be able to smoothly interact with various types of users. When we started this project, we tried to put ourselves in the shoes of the potential users of this website. We discussed what users would require and want, like how to navigate the site more easily, and how users would be able to efficiently complete their task or use our services. To mitigate this challenge, we separated the website's pages depending on the user type and the services they can access. The site shows different content depending on the type of user that is logged in. If the user is a company, they would be able to find professionals to hire. On the other hand, if it is a professional user, they can browse a list of companies and their projects. Another feature shared in the website is the 'My Projects' button, which functions differently depending on the user type. Usability of pages and the navigation bar were complicated to achieve. Hence, leading to a few code repetition in the project.

Error Handling

Error handling is a vital part of any web application's user experience. One of the challenges is to detect and capture errors that occur in the browser. Unlike backend applications, frontend applications might not contain any built-in mechanism for halting processes and displaying error messages. We tried to think of various successful and fail cases when using the features in the frontend and performed tests so that the frontend would rarely fail. When users do not have access to perform certain actions on the site, the buttons or the interface for those actions would not appear. Not only does this result in a more simple website, but also easy to navigate. It also reduces the possibility of users experiencing errors when using the website's features.

Other Challenges

API Integration

At the start of the project, the backend documentation is not clear enough, which creates confusion for the frontend team when calling the API functions. To solve this, the backend team has created a more detailed documentation containing all the required information and usage examples when calling the API functions. Figure 6 shown below is an API example used to approve, reject or remove a professional user.

The screenshot shows a detailed API documentation page. At the top, there's a header with icons for 'Documentation' and a close button. Below the header, the URL is shown as {{localhost}}/project/:id/:action/:userId. The main content starts with a note about the API for company users to approve, reject, or remove professionals. It includes a 'NOTE:' section with a list of bullet points: Only the creator of the project can approve, reject, or remove professional users; This will essentially move the user to a field called approved applicants field in the project details if a user is approved. If the user is rejected, this will just remove the user from the potential applicant field; This API also automatically sends approval/rejection letter to the professional user. Below this is an 'Authorization' section requiring a 'Bearer Token'. The 'Path Variables' section lists three variables: 'id' with value 6536946a4fb7f71c832f6896 and description 'project id'; 'action' with value 'reject' and description 'approve or reject or remove'; and 'userId' with value 65368ad0838fa5476b3fe150 and description 'user to be approved/rejected'.

Figure 6: API Function Documentation

Storyboards

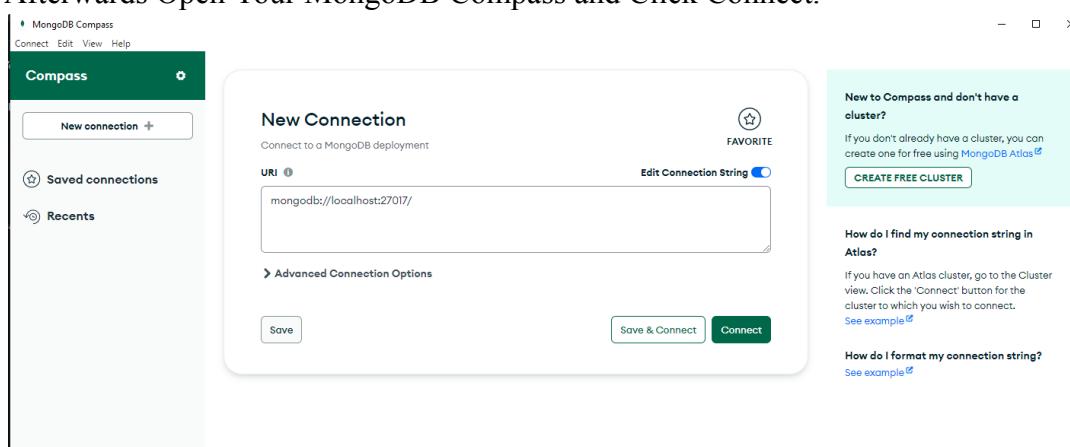
Figma and Google services were used to create storyboards of the application features and functionalities, based on the epic stories. These low fidelity storyboards for a company user and a professional user are then converted into high fidelity wireframes that the frontend team based on when developing the website user interface. [Figma link](#) contains both the low and high fidelity wireframes.

User Manual

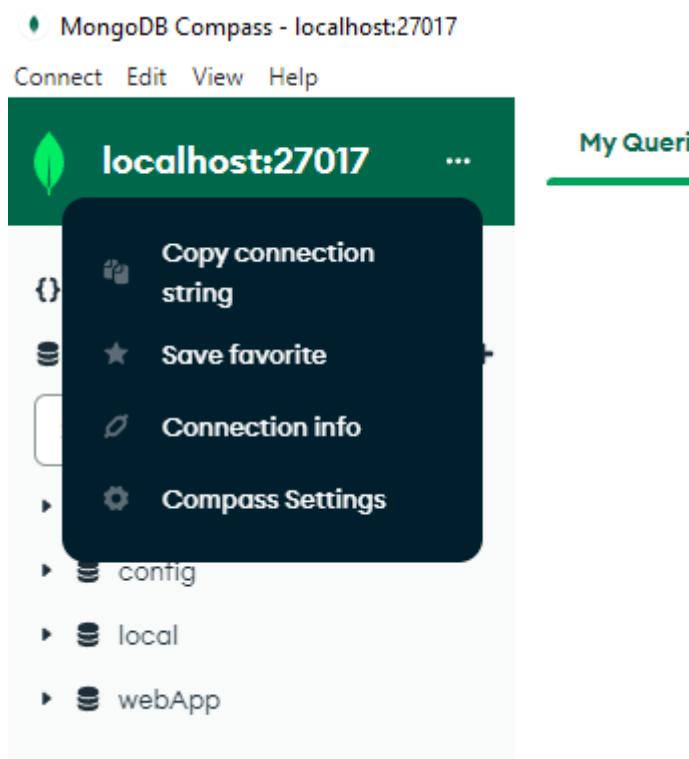
Installation

How to Install for Windows (Window Version that is used during development is Windows 10):

1. Ensure you have Node and NPM Installed (Node Version That is used during Development: v18.16.0. NPM Version Used During Development: 9.5.1).
2. Install MongoDB Community Server on your computer (<https://www.mongodb.com/try/download/community>), Make sure to also install MongoDB compass which should come in one package with the MongoDB Community Server Installer.
3. Using your command line, Go to the backend folder and run npm install.
4. Afterwards Open Your MongoDB Compass and Click Connect.



5. Then Copy the Connection String which should give you something like 'mongodb://localhost:27017'.



6. Afterwards, Copy the .sample-env file and make a copy of it inside the backend folder and rename it to .env, Then delete the comment in the first line and replace the value for the MONGODB URL to your connection string. Make sure to change the localhost string in the mongodb URL String into the actual local host ip which should be 127.0.0.1. Overall the env file should look like this.

```

EXPLORER ... README.md .env
COMP9900 ...
backend ...
adminScript
node_modules
src
.env
.gitignore
.sample-env
howtocreateadmin.txt
package-lock.json
package.json
README.md
tsconfig.json
diary

```

```

backend > .env
1 MONGODB_URL=mongodb://127.0.0.1:27017
2 SECRET=OKBUDDY

```

7. Then Go to the 'connected' (located in /frontend/connected folder located inside the frontend folder and run npm install.

Populating The Database using the existing provided database)

1. To Populate the Database, First download the MongoDB Command Line Database Tools Download from https://fastdl.mongodb.org/tools/db/mongodb-database-tools-windows-x86_64-100.9.1.zip or <https://www.mongodb.com/try/download/database-tools>.

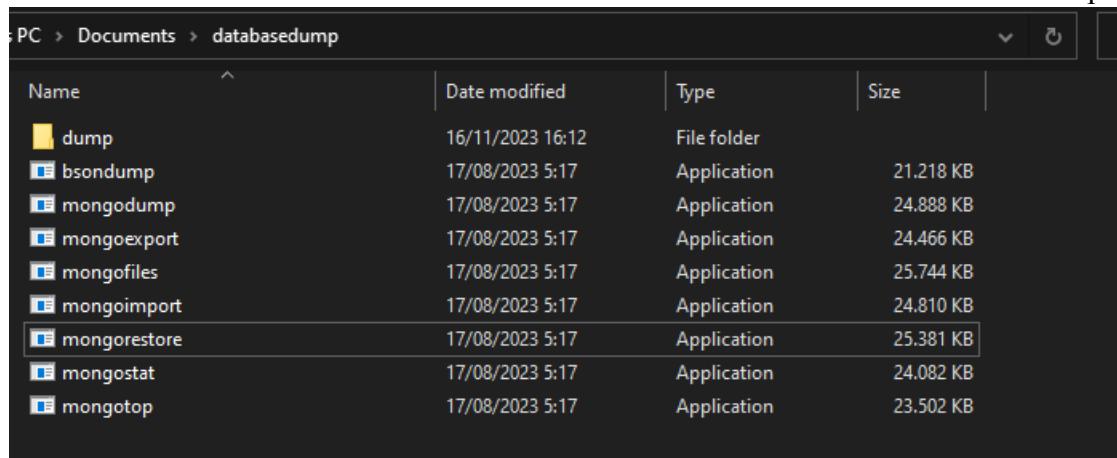
MongoDB Command Line Database Tools Download

The MongoDB Database Tools are a collection of command-line utilities for working with a MongoDB deployment. These tools release independently from the MongoDB Server schedule enabling you to receive more frequent updates and leverage new features as soon as they are available. See the [MongoDB Database Tools](#) documentation for more information.

Version	100.9.1
Platform	Windows x86_64
Package	zip

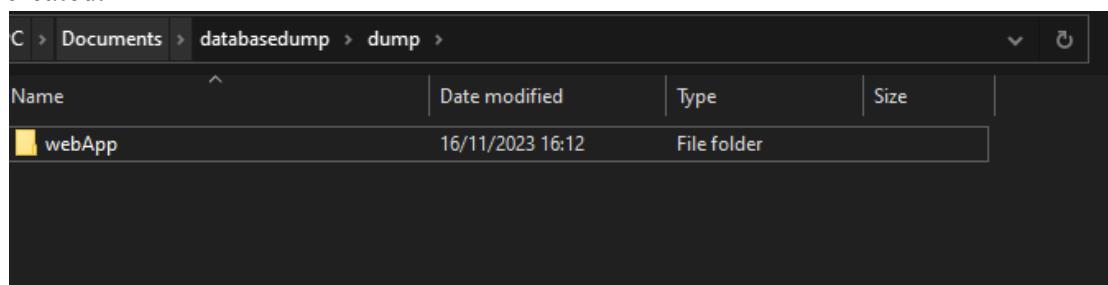
Download Copy link More Options

2. Extract the files inside the bin folder of the downloaded file into any folder. Inside that folder create another folder called dump.



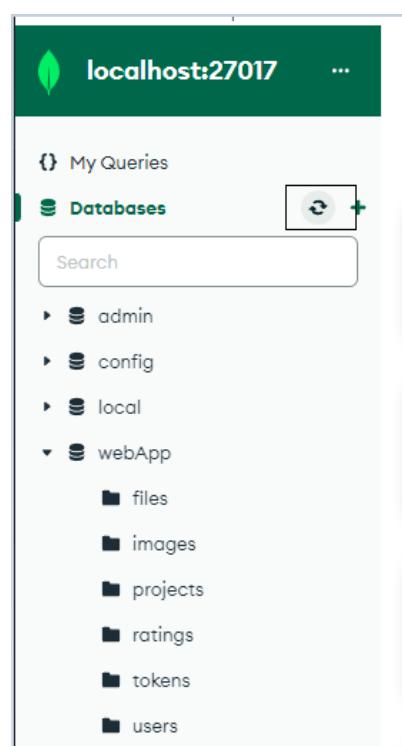
Name	Date modified	Type	Size
dump	16/11/2023 16:12	File folder	
bsondump	17/08/2023 5:17	Application	21.218 KB
mongodump	17/08/2023 5:17	Application	24.888 KB
mongoexport	17/08/2023 5:17	Application	24.466 KB
mongofiles	17/08/2023 5:17	Application	25.744 KB
mongoimport	17/08/2023 5:17	Application	24.810 KB
mongorestore	17/08/2023 5:17	Application	25.381 KB
mongostat	17/08/2023 5:17	Application	24.082 KB
mongotop	17/08/2023 5:17	Application	23.502 KB

3. From the project folder, Copy the webApp folder into the dump folder you just created.



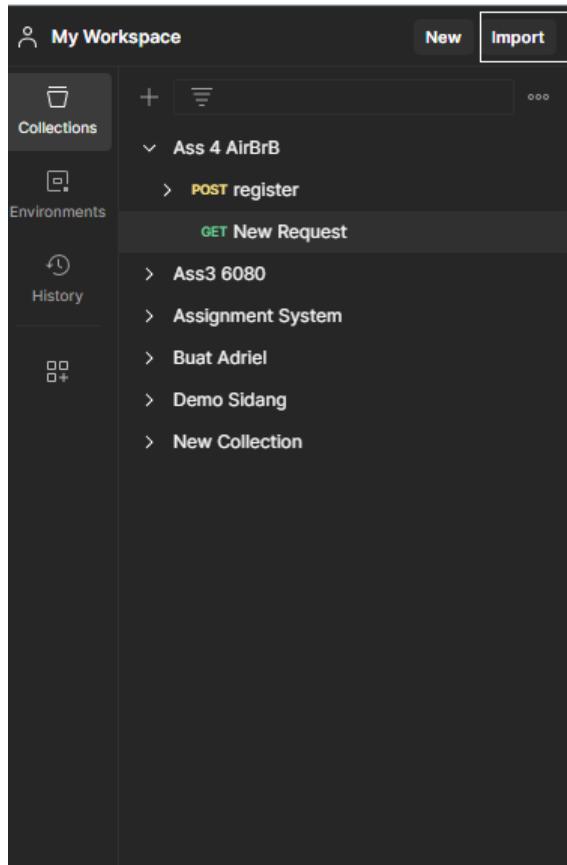
Name	Date modified	Type	Size
webApp	16/11/2023 16:12	File folder	

4. Afterwards run the mongorestore application and it should automatically import the database. To check, you can click the refresh databases button in the mongodb compass and it should show the webApp database. To use any accounts inside the user collection their default password is 12341234.

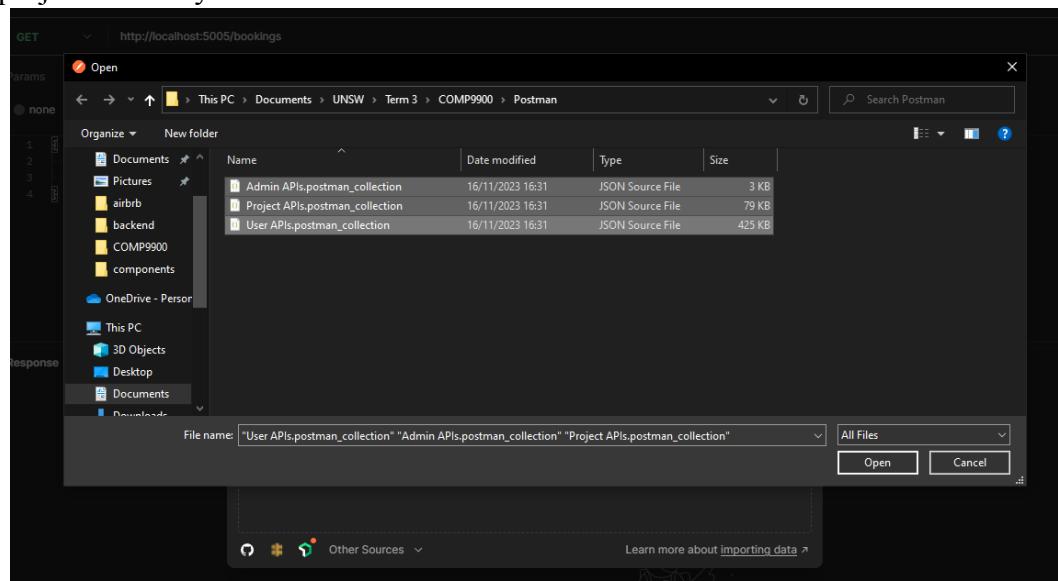


Optional: Viewing the Postman Documentation

1. Install Postman on your machine and open it.

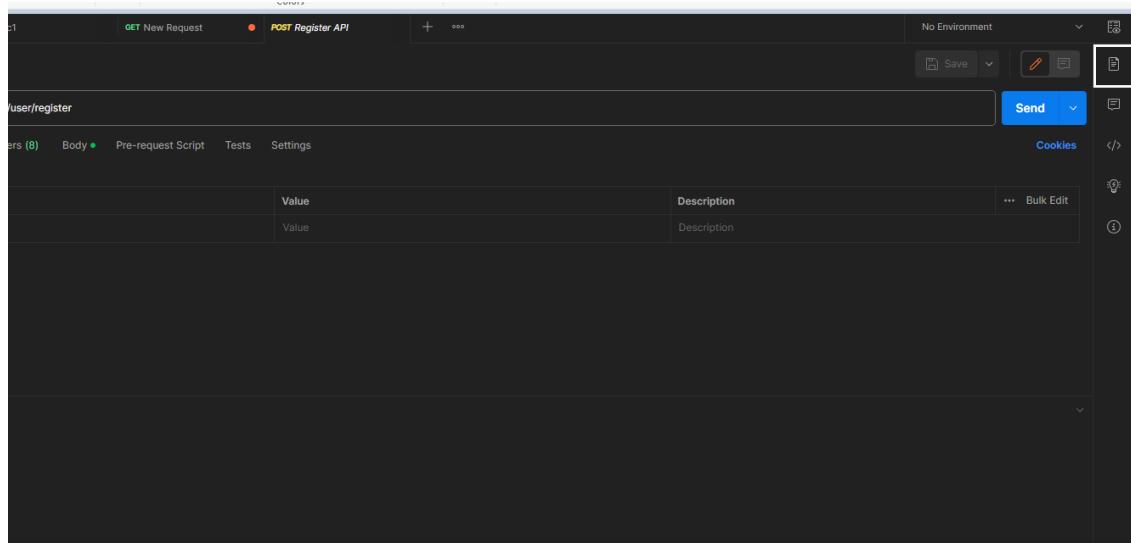


2. Click Import on postman and drag/select all the files inside the Postman folder of the project directory.



3. Then Click Import where afterwards you should see the documentation and examples of the backend API.

4. In each API documentation you can click the document button to see more details about the API.



How to Run the Application for Windows

1. Make Sure the MongoDB database is running
2. Go to the backend directory and run npm run dev (Make sure the backend runs first before the frontend). If its successful you should see this in the terminal.

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
PS C:\Users\Nicholas\Documents\UNSW\Term 3\COMP9900\backend> npm run dev
> backend@1.0.0 dev
> nodemon src/app.ts

[nodemon] 3.0.1
[nodemon] to restart at any time, enter `rs`
[nodemon] watching path(s): src\**\*
[nodemon] watching extensions: ts,js
[nodemon] starting `node -r tsconfig-paths/register -r ts-node/register ./src/app.ts src/app.ts`
mongodb://127.0.0.1:27017/webApp
MongoDB database successfully connected
Application is running on port 3000

```

3. Afterward go to the 'connected' directory inside the frontend folder and run npm run dev which should show this terminal.

```
v18.16.0
PS C:\Users\Nicholas\Documents\UNSW\Term 3\COMP9900> cd .\frontend\connected\
PS C:\Users\Nicholas\Documents\UNSW\Term 3\COMP9900\frontend\connected> npm run dev
> connected@0.1.0 dev
> next dev

⚠ Port 3000 is in use, trying 3001 instead.
▲ Next.js 13.5.4
- Local: http://localhost:3001

✓ Ready in 3.9s
```

4. Open the website using the url provided by the terminal of the frontend terminal which by default should be <http://localhost:3001>.

How to Install MongoDB on MacOS (Ensure your macOS is version 11 or later for MongoDB 7.0 Community Edition):*Prerequisites:*

1. Install Xcode Command-Line Tools:
 - Open Terminal.
 - Run: `xcode-select --install`.
 - This step is needed as Homebrew, which you'll use to install MongoDB.
2. Install Homebrew: Follow the official Homebrew installation instructions since macOS doesn't include it by default.

Installation Steps:

1. Tap MongoDB Homebrew Tap:
 - In Terminal, run: `brew tap mongodb/brew`.
2. Update Homebrew:
 - Run: `brew update` to update Homebrew and its formulae.

Install MongoDB:

1. Run: `brew install mongodb-community@7.0`.
 - This command installs MongoDB along with binaries like `mongod` (server), `mongos` (sharded cluster query router), and `mongosh` (MongoDB Shell).
 - Installation paths differ based on your processor (Intel or Apple Silicon):
 - Intel: `/usr/local/etc/mongod.conf`
 - Apple Silicon: `/opt/homebrew/etc/mongod.conf`.

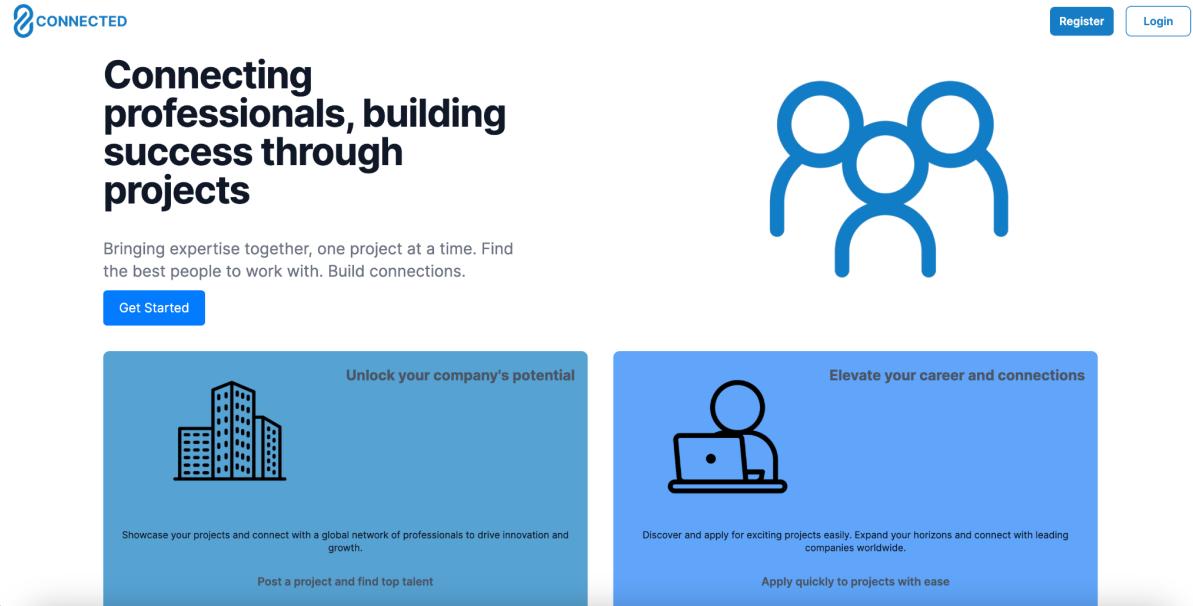
Running MongoDB:

1. Run as macOS Service:
 - To start: `brew services start mongodb-community@7.0`.
 - To stop: `brew services stop mongodb-community@7.0`.

Appendix

Frontend Functionalities Implementation

1. Login and registration



Appendix 1.1: Landing Page

The screenshot shows the 'Log in to Connected' page. It features a central form with fields for 'Email address' and 'Password'. A 'Forgot password?' link is located next to the password field. A large blue 'Log in' button is centered below the fields. At the bottom of the form, there is a link for users who don't have an account: 'Don't have an account with us? Sign up'.

Appendix 1.2: Login Page



Join as a Professional or a Company



I'm a professional, looking for work



I'm a company, hiring for a project

Already have an account? [Log In](#)

Appendix 1.3.1: Registration Page



Looking for work? [Join as a Professional](#)

Sign up to find talented professionals

Username	Company Name
<input type="text"/>	<input type="text"/>
Address	Company Link
<input type="text"/>	<input type="text"/>
ABN	Phone Number
<input type="text"/>	<input type="text"/>
Industry Type	Brief Description
Finance	<input type="text"/>
Email	Confirm Email
<input type="text"/>	<input type="text"/>
Password	Confirm Password
Create Account	

Already have an account? [Log In](#)

Appendix 1.3.2: Registration Form Page for Company Users



Here to hire professionals? [Join as a Company](#)

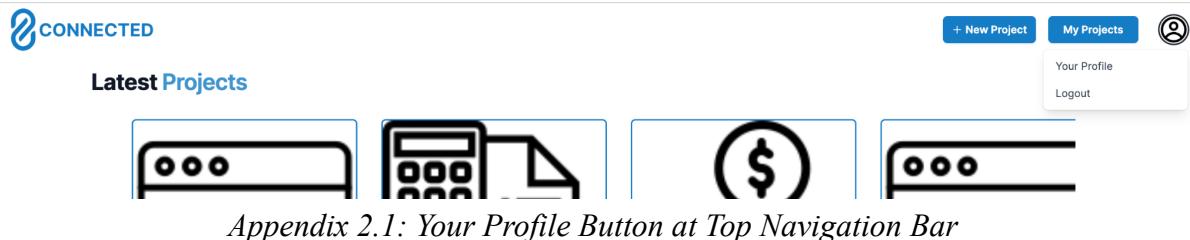
Sign up to find projects you're interested

Username	First Name
<input type="text"/>	<input type="text"/>
Last Name	Address
<input type="text"/>	<input type="text"/>
LinkedIn Link	Date of Birth
<input type="text"/>	<input type="text"/>
Phone Number	Industry Type
<input type="text"/>	Finance
Email	Confirm Email
<input type="text"/>	<input type="text"/>
Password	Confirm Password
Create Account	

Already have an account? [Log In](#)

Appendix 1.3.3: Registration Form Page for Professional Users

2. View/edit profile



Appendix 2.1: Your Profile Button at Top Navigation Bar

The screenshot shows a user profile page for 'Sheina Tengara'. It features a large circular placeholder for a profile picture, the name 'Sheina Tengara', the handle 'sheina.tengara', and a 'technology' tag. Below this are contact details: address '8 Defries Ave, Waterloo 2017', phone number '0404123412', email 'sheina.tengara@gmail.com', and a 'Download CV' button. A 'Description' section below contains the text 'UNSW Graduate from Jakarta'. On the right side of the profile card are 'Edit Profile' and 'in' (LinkedIn) buttons.

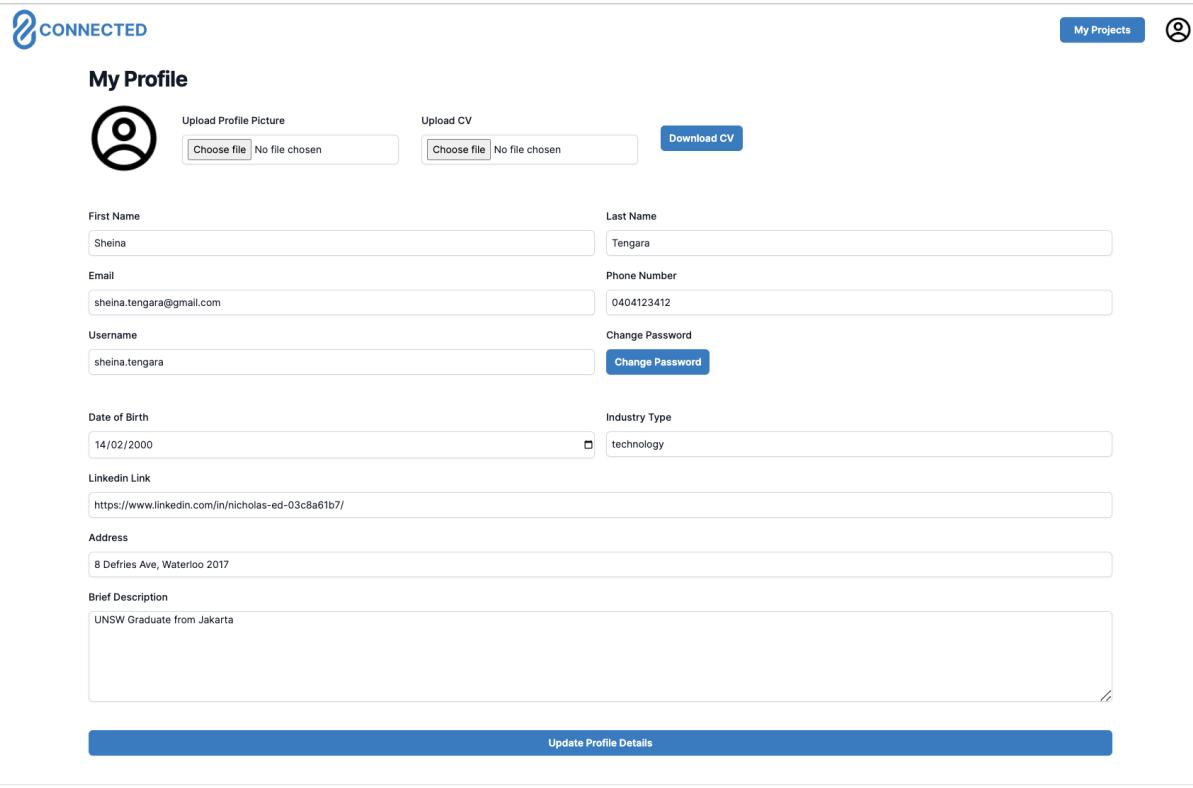
Project Ratings

The screenshot displays two project rating cards. The first card is for 'Makan bang' with a 5-star rating, completed between 22 Aug 2023 and 27 Dec 2023, for creating a website for moodle33. It involved 353 professionals over 15 hours and was done for caesar.coutts company using python, react, node js, vs code. The second card is for 'Align Website' with a 5-star rating, completed between 15 Nov 2023 and 19 Nov 2023, for Create a Align Website. It involved 5 professionals over 50 hours and was done for Comp.Align company using React JS, MongoDB.



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Appendix 2.2: Your Profile Page



My Profile

Upload Profile Picture No file chosen

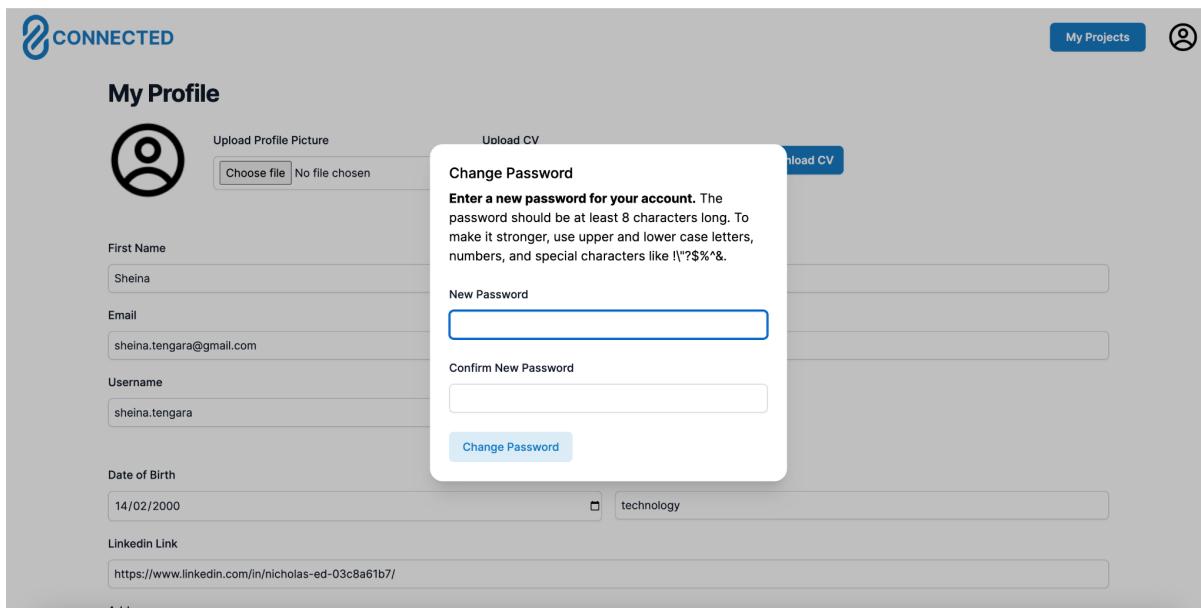
Upload CV No file chosen [Download CV](#)

First Name Sheina	Last Name Tengara
Email sheina.tengara@gmail.com	Phone Number 0404123412
Username sheina.tengara	Change Password
Date of Birth 14/02/2000	Industry Type technology
LinkedIn Link https://www.linkedin.com/in/nicholas-ed-03c8a61b7/	
Address 8 Defries Ave, Waterloo 2017	
Brief Description UNSW Graduate from Jakarta	

[Update Profile Details](#)

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Appendix 2.3: Edit Profile Page



My Profile

Upload Profile Picture Choose file No file chosen

Upload CV Choose file Upload CV

Change Password

Enter a new password for your account. The password should be at least 8 characters long. To make it stronger, use upper and lower case letters, numbers, and special characters like !?"\$%^&.

New Password

Confirm New Password

[Change Password](#)

First Name Sheina	Date of Birth 14/02/2000	Industry Type technology
Email sheina.tengara@gmail.com	LinkedIn Link https://www.linkedin.com/in/nicholas-ed-03c8a61b7/	
Username sheina.tengara	Address	

Appendix 2.4: Change Password Modal

3. Feed categorisation and filtering

The screenshot shows the 'Latest Projects' section of the platform. It features four project cards:

- Ca External Web**: Start Date: 20/11/2023, End Date: 27/11/2023, Comp.Align, \$50/hour, Create a website for CA.
- CA Accounting**: Start Date: 30/11/2023, End Date: 29/12/2023, Comp.Align, \$50/hour, Hiring for account team.
- CA Finance**: Start Date: 22/11/2023, End Date: 22/12/2023, Comp.Align, \$66/hour, Hiring for a finance team.
- CA internal web**: Start Date: 13/11/2023, End Date: 28/11/2023, Comp.Align, \$50/hour, Work on internal web for tr...

Below this section is a 'Hire Professionals' section with four placeholder images of people.

Appendix 3.1.1: Home Page for Company User

The screenshot shows the 'Available companies' section of the platform. It features four company cards:

- Heli Moley**: heli.moley@gmail.com, +61489032853
- Caesar Coutts**: c.coutts@gmail.com, +61489032852, Big company focusing on Generative AI and I...
- Tech Solutions Inc.**: info@techsolutions.com, +1122334455
- Manufacturing Innovat**: contact@manufacturinginnovat..., +9988776655

Appendix 3.1.2: Home Page for Professional User

Trending Projects

Search Toggle Filter 🔍

Project Name	Description	Start Date	End Date	Owner	Rate	Notes
car3	Create a website for moodle33	22/08/2020	27/09/2021	caesar.coutts	\$1000/hr/hour	
Coutts AI Website	Create a new website.	31/10/2023	05/11/2023	caesar.coutts	\$50/hr/hour	
Clothes	Create a website for moodle33	22/08/2023	27/12/2023	caesar.coutts	\$1000/hr/hour	

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Appendix 3.2: All Projects Page (“/projects”)

Available Professionals

vin lin vincent.lin@gmail.com 0404123414 Junior Software Engineering at Connected. ...	jj lin jj.lin@gmail.com 0404123414	Patsy Ullrich patsy.ulrich@gmail.com +61412345678	Sheina Tengara sheina.tengara@gmail.com 0404123412 UNSW Graduate from Jakarta

Appendix 3.3: All Professionals Page (“/professional-list”)

Available Companies

Heli Moley heli.moley@gmail.com +61489032853	Caesar Coutts c.coutts@gmail.com +61489032852 Big company focusing on Generative AI and I...	Tech Solutions Inc. info@techsolutions.com +11223344555	Manufacturing Innovators Ltd. contact@manufacturinginnovators.com +9988776655

Appendix 3.4: All Companies Page (“/company-list”)

4. Project management

Waiting for Approvals

Search

Toggle Filter



car3
Start Date: 22/08/2020
End Date: 27/09/2021
[caesar.coutts](#)
\$\$1000/hr/hour
create a website for moodle33



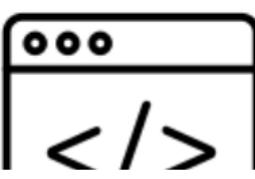
Clothes
Start Date: 22/08/2023
End Date: 27/12/2023
[caesar.coutts](#)
\$\$1000/hr/hour
create a website for moodle33

Invited Projects

Search

Toggle Fourth Filter

<



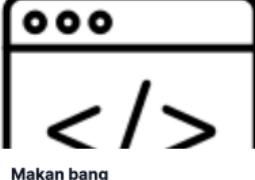
Coutts AI Website
Start Date: 31/10/2023
End Date: 05/11/2023
[caesar.coutts](#)
\$\$50/hr/hour
Create a new website.

Past Projects

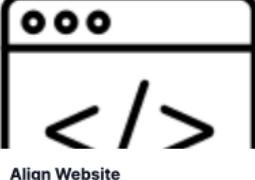
Search

Toggle Third Filter

<



Makan bang
Start Date: 22/08/2023
End Date: 27/12/2023
[caesar.coutts](#)



Align Website
Start Date: 15/11/2023
End Date: 19/11/2023
[Comp.Align](#)

Appendix 4.1: My Projects Page for Professional Users

Planned Projects

Search Q

[Toggle Filter](#)



CA customer service
Start Date: 20/11/2023
End Date: 24/11/2023
Comp.Align
\$40/hour
Create a website for Customer Service.



CA Finance
Start Date: 22/11/2023
End Date: 22/12/2023
Comp.Align
\$66/hour
Hiring for a finance team.



CA Accounting
Start Date: 30/11/2023
End Date: 29/12/2023
Comp.Align
\$50/hour
Hiring for account team.



Ca External Web
Start Date: 20/11/2023
End Date: 27/11/2023
Comp.Align
\$50/hour
Create a website for CA.

Ongoing Projects

Search Q

[Toggle Secondary Filter](#)



CA internal web
Start Date: 13/11/2023
End Date: 28/11/2023
Comp.Align
\$50/hour
Work on internal web for the company



...
...

Past Projects

Search Q

[Toggle Third Filter](#)



...



...

Appendix 4.2: My Projects Page for Company Users

Fill in the details for the new Project post

Project Title	Industry Type
	Finance
Start Date	End Date
dd/mm/yyyy	dd/mm/yyyy
Number of Professionals Needed	Preferred Experiences
5	Web development internship
Expected Working Hours	Technical Skills
60	React JS
Price per hr	Soft Skills
50	Team player, Good communication skills
Work Placement	Brief Description
<input type="radio"/> Online <input checked="" type="radio"/> Offline	

Post Project

Appendix 4.3: Company User Create New Project Post

5. View/edit individual project

CA internal web [</>](#)

Edit Project **Finish Project** **Delete Project**

Start Date: 13/11/2023 End Date: 28/11/2023

Project in web development Held in online

\$50/hr . No. of Professionals: 8 . Expected Working Hours: 70hr

Skills Preferred: Next JS

Experiences:

Required Professional Criteria: Team Player

Description

Work on internal web for the company

Onboard Professionals



Applied Professionals



Invited Professionals

*Appendix 5.1: Company User View Project Page (Ongoing Project)*



Project

Project Title	Description
CA internal web	Work on internal web for the company
Start Date	End Date
13/11/2023	28/11/2023
Number of Professionals	Expected Working Hours
8	70
Skills	Experiences
Next JS	
Online/Offline	Price Budget
online	50
Required Professional Criteria	
Team Player	
Update Project Details	



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Appendix 5.2: Company User Edit Project Page

6. Project application

Sheina Tengara

technology
8 Defries Ave, Waterloo 2017
0404123412 sheina.tengara@gmail.com

Hire Professional

Description
UNSW Graduate from Jakarta

Download CV

Project Ratings

Makan bang ★★★★☆

22 Aug 2023 - 27 Dec 2023
create a website for moodle33
353 professionals - \$1000/hr - 15 hours

caesar.coutts company

python, react, node js, vs code

Align Website ★★★★☆

15 Nov 2023 - 19 Nov 2023
Create a Align Website
5 professionals - 50 - 50 hours

Comp.Align company

React JS, MongoDB



Reach out to us

Appendix 6.1.1: Company User View Professional Profile Page

The screenshot shows a user profile for "Sheina Tengara". At the top, there's a blue header bar with the eCONNECTED logo, a "New Project" button, a "My Projects" button, and a user icon. Below the header, the profile card has the name "Sheina Tengara" in bold, an email address "sheina.tengara@gmail.com", and a "technology" tag. A "Description" section notes "UNSW Graduate from Jakarta".

Invite Sheina Tengara to join a project

The screenshot displays four project cards for invitation:

- CA customer service**: 2023-11-20T00:00:00.000Z - 2023-11-24T00:00:00.000Z. web development. 5 professionals -- 40. Create a website for Customer Service. [Invite to CA customer service](#)
- CA internal web**: 2023-11-13T00:00:00.000Z - 2023-11-28T00:00:00.000Z. web development. 8 professionals -- 50. Work on internal web for the company. [Invite to CA internal web](#)
- CA Finance**: 2023-11-22T00:00:00.000Z - 2023-12-22T00:00:00.000Z. finance. 3 professionals -- 66. Hiring for a finance team. [Invite to CA Finance](#)
- CA Accounting**: 2023-11-30T00:00:00.000Z - 2023-12-29T00:00:00.000Z. accounting. 3 professionals -- 50. Hiring for account team. [Invite to CA Accounting](#)

eCONNECTED Reach out to us [✉️](#)

Appendix 6.1.2: Company User Hire Professional Page

The screenshot shows a project listing for "Ca External Web". It includes the start date (20/11/2023), end date (27/11/2023), project type (web development), location (Held online), rate (\$50/hr), number of professionals (4), expected working hours (60hr), skills required (React JS), experience (Web development internships), and required professional criteria (Team player). A "Description" section notes "Create a website for CA." and a "Join Project" button at the bottom.

eCONNECTED Reach out to us [✉️](#)

Appendix 6.2: Professional User View Project Page to Join Project

7. Email notification for Professional Users

Invitation to Join Project - Align Website Inbox ×



okaybuddy646@gmail.com

to me ▾

You are invited to join the project 'Align Website' as a professional.

Click the link below to accept the invitation:

<http://localhost:3001/project/6551835a6689657029974401>

Appendix 7.1: Invitation to Join Project Notification

Confirmation for requested project - Align Website Inbox ×



okaybuddy646@gmail.com

to me ▾

Your request to join 'Align Website' has been sent.

You will get an update on the status of your application soon.

Appendix 7.2: Successful Project Request Confirmation Email

Approval to Join Project - Align Website Inbox ×



okaybuddy646@gmail.com

to me ▾

You have been approved to join the project 'Align Website' as a professional.

Appendix 7.3: Approved Project Request Email

8. Project completion

Align Website </>

Start Date: 15/11/2023 End Date: 19/11/2023

Project in web development Held in offline
\$50/hr . No. of Professionals: 5 . Expected Working Hours: 50hr
Skills Preferred: React JS, MongoDB
Experiences: Web development internships
Required Professional Criteria: Team player

Description

Create a Align Website

Past Professionals

Sheina Tengara
Rating: ★★★★☆
Submit

< >

Appendix 8.1: View Completed Project Page (Company User)

Align Website </>

Start Date: 15/11/2023 End Date: 19/11/2023

Project in web development Held in offline
\$50/hr . No. of Professionals: 5 . Expected Working Hours: 50hr
Skills Preferred: React JS, MongoDB
Experiences: Web development internships
Required Professional Criteria: Team player

Description

Create a Align Website

Join Project

Rate Project

Project Rating:
★★★★☆

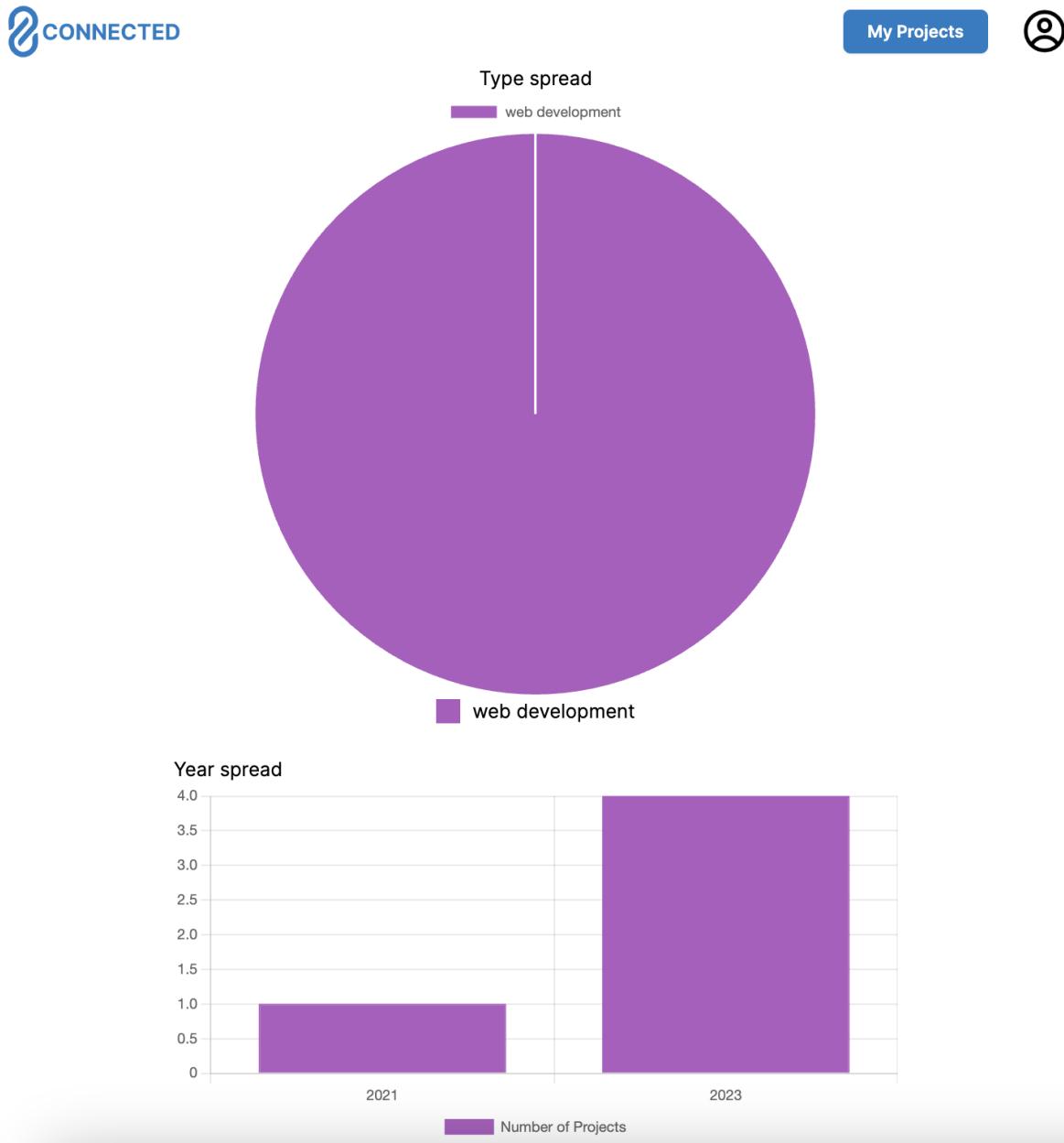
Submit Project Rating

Download Certificate



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Appendix 8.2: View Completed Project Page (Professional User)

9. Admin system control*Appendix 9: Home Page with Statistics (Admin User)*

References

- Lau, Y. (2021, June 2). How Organizations Can Become Project-Based In The Future Of Work. Retrieved September 28, 2023, from <https://www.forbes.com/sites/forbeshumanresourcescouncil/2021/06/02/how-organizations-can-become-project-based-in-the-future-of-work/?sh=6fa63b6929e4>
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- Hire Freelancers & Find Freelance Jobs Online. Retrieved September 27, 2023, from <https://www.freelancer.com/>
- Express.* Express - Node.js web application framework. Retrieved September 26, 2023, from <https://expressjs.com/>
- MongoDB.* MongoDB: The Developer Data Platform | MongoDB. Retrieved September 26, 2023, from <https://www.mongodb.com/>
- React.* React. Retrieved September 26, 2023, from <https://react.dev/>
- TypeScript.* TypeScript: JavaScript With Syntax For Types. Retrieved September 26, 2023, from <https://www.typescriptlang.org/>