

# ANKARA UNIVERSITY FACULTY OF ENGINEERINGDEPARTMENT OF COMPUTER ENGINEERING

# Jobie

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# Abstract

Many people have talents and qualifications, but they don't know how to present themselves, or they look for a job in the incorrect area or style. Companies also struggle to discover personnel who meet specified requirements. Jobie is an employment service platform that allows companies to announce jobs and positions in various fields, as well as help people improve their careers by recommending the best job for them. By creating an account on Jobie, people can register their information and experiences, and companies can announce their offers; as a result, the platform creates a link between people and companies. Furthermore, Jobie offers freelancing chances to users who do not wish to work full-time by creating an account as a freelancer, which allows a firm to pick a freelancer based on his specialization and prior work rate.

Jobie will be available as a website and mobile application, which sets it apart from other platforms on the market.

# Chapter 1

# Introduction

People are always seeking occupations that would give them a happy and comfortable existence, thus we see people looking for jobs that will pay them well in order to live that life.

## 1.1 Problem Statement

Many jobless people, particularly graduates, have trouble obtaining employment that suits them because they lack an appropriate understanding of the labor market and existing businesses. Furthermore, when business owners are looking for employees, the existing sites do not make it easy to categorize individuals by their type, whether they are regular users or Freelancers.

# 1.2 Objectives

This project seeks to assist job holders to locate employees who meet their requirements, as well as helping the jobless find the employment they desire.

# 1.3 Scope of the work

- 1. Create accounts: Jobie users can make their own accounts and fill up their personal information as they see fit.
- 2. Recommendations to the users: The user's interests are taken into account when the list of job applications or users is displayed.
- 3. **Notification Feature:** When someone applies for one of the company's open positions, job holders are notified.
- 4. **Search Feature:** Users can use this feature to look for other users or jobs based on specified criteria, such as location.
- 5. **Providing feedback Feature:** This feature assists business owners in evaluating and providing feedback to freelancers with whom they have worked.

6. A fully functional website and mobile application that allows Jobie to operate as it is desired.

# 1.4 Significance

People seeking employment may explore the platform and interact with all of its features in a simple and straightforward manner, regardless of their degree of technical and scientific expertise, because it is concerned with all aspects of life, not only technology disciplines.

# Chapter 2

# Constraints and Earlier Coursework

#### 2.1 Constraints Limitations

Building a comprehensive application with all of the requested features takes a lot of time that we didn't have since it takes time to learn the relevant technologies, pick concepts and design the user interface. All of the necessary elements and features have been established to finish this project and it will be enhanced in the future. We also lacked some educational materials that we needed to solve the challenges we were facing.

## 2.2 Earlier Coursework

- Database Design Management course:
   This platform's database is entirely made on NoSQL (No Structured Query Language). Database design principles and crucial concepts like dependencies, keys, and indexes were also covered in this course.
- Critical Thinking & Scientific Research course: In order to finish this course, students were taught how to read scientific publications and how to produce research papers using current technologies such as latex.
- Web Development course:
   This course focused on the programming languages required to accomplish the project, such as HTML, CSS, and Javascript.
- Software Engineering course:
  All of the principles and approaches covered in this course, such as software requirements, architecture, and user acceptability, have been shown to be effective and helpful, and they were implemented in this project.

# Chapter 3

# Literature Review

As previously stated, Jobie aims to develop society by providing job opportunities to the greatest number of unemployed people and by providing a platform that connects business owners and job seekers. However, it was not the first; there are numerous websites that perform the same function, such as:

## 3.1 LinkedIn

LinkedIn is a global platform that offers business and employment services that was founded in 2003[1].

## Advantages

- 1. Allows users to share various posts, which improves the communication between them
- 2. It has millions of users all over the world, which increases the likelihood of the user finding a job that suits him.

# Disadvantages

- 1. In order to use its features, you must first create an account.
- 2. It sometimes goes beyond being a site for job postings and business services to become more similar to social media sites. Nothing prevents you from publishing content other than job postings.

## 3.2 Jobs

it's an employment website aims to empowering employers and job seekers with the necessary tools and information to find jobs and job candidates in Palestine.[2].

## Advantages

- 1. It is more than just a job site because it is primarily focused with giving work chances, but it also offers training courses in several sectors and numerous articles.
- 2. To utilize the website, no user accounts are required.

## Disadvantages

- 1. The website's user interface is remarkably similar to newspapers.
- 2. The site does not evaluate users' preferences and cannot make recommendations based on their preferences.

# 3.3 What enhancements did Jobie bring?

Jobie was designed to be as simple as possible for all users, regardless of their technological knowledge, and to include features not found on current platforms and sites, such as the ability to search for jobs without creating an account, as well as the ability to apply for jobs. Furthermore, it is only for job-related services; you cannot publish personal posts in it.

# Chapter 4

# Methodology

# 4.1 Used Technologies

#### 4.1.1 ReactJS

ReactJS is a free and open-source front-end JavaScript framework for creating UI components-based user interfaces.[3] Meta (previously Facebook) and a community of individual developers and corporations manage it. React may be used as a foundation for single-page, mobile, or server-rendered apps.

#### Why ReactJS?

- 1. React provides a clean and simple syntax called JSX syntax, which is comparable to HTML but allows the developer to insert JavaScript code into the front-end design, giving them more control over the component.
- 2. Reusability, one of React's most powerful features is reusable components. In another meaning, reusing an existing component rather than creating it again from scratch.
- 3. It supports a huge number of free libraries that give ready components that may make the development process easier for the developer, such as Bootstrap React.
- 4. Fast rendering.

## 4.1.2 Ant Design

The Ant Design System is an open source code for enterprise-level UI design languages and React UI library that was released on April 24, 2015.[4] It comes with a set of high-quality React components and icons, with theme customization capability.

#### Why Ant design?

- 1. A comprehensive documentation and free tutorials accessible on the internet to assist developers in using it step by step.
- 2. Ant Design supports a massive and excellent collection of components and icons.

## 4.1.3 ExpressJs

ExpressJs is a NodeJs back-end web application framework that's available as free and open-source software under the MIT License. It is intended for the development of web applications and APIs. [5]

#### Why ExpressJs?

ExpressJs provides several capabilities, such as making NodeJS web application development simple, allowing for instant connection formation with databases such as MongoDB, and allowing developers to easily construct a scalable server using the REST API.

## 4.1.4 MongoDB

MongoDB is an open-source, cross-platform document-oriented database application. MongoDB is a NoSQL database program that uses JSON-like documents with optional schemas.

The following technologies, which are related to MongoDb, were used in the project:

- 1. **Mongodb Atlas**, it is a multi-cloud database service developed by the same team that created MongoDB.[6]
- 2. MongoDb Compass, it is a robust graphical user interface (GUI) for querying, collecting, and analyzing your MongoDB data. It is free to use and open source, and it can be used on macOS, Windows, and Linux.[7]
- 3. Mongoose, it is a MongoDB and Node.js Object Data Modeling (ODM) module. It handles data associations, does schema validation, and is used to translate between objects in code and their representation in MongoDB. [8]

#### Why these technologies?

- 1. Because the database utilized in this project is NoSQL, MongoDb was adopted, which delivers excellent speed and minimal latency.
- 2. MongoDb Compass is a very easy-to-use GUI that allows users to track their data in an effective manner.
- 3. Models in Mongoose do the majority of the work, such as setting default values for document attributes and verifying data.
- 4. Queries employ function chaining rather than incorporated mnemonics, resulting in code that is more flexible and understandable, and hence more maintainable.

## 4.1.5 Other technologies & tools

There are multiple other technologies used, including:

1. **Firebase**, it is a Google-backed application development platform that allows developers to create iOS, Android, and Web applications. Firebase provides capabilities for measuring metrics, reporting and repairing app errors, developing marketing campaigns, and testing new products. It was used in Jobie for pushing notifications to the application through it.

- 2. **React Router** is a tool for handling routes in a web app by utilizing dynamic routing that occurs when the app is rendering on the machine to create a single page application. [9]
- 3. Expo, it is an open-source framework for developing JavaScript and React-based universal native apps for Android, iOS, and the web[10]. It was used with react-native for the mobile application development.
- 4. **node-cache**, it is a module that stores a copy of a specified resource and returns it when requested.[11]
- 5. **JWT** (JSON Web Token) is an open standard for exchanging security information between a client and a server, and is commonly used for user login authentication. [12]
- 6. **bcrypt**, it is a password-hashing function. [13]
- 7. **axios**, it is a Javascript library that may be used to make HTTP requests from node.js or XMLHttpRequests from the browser, and it supports the Promise API. [14]
- 8. react-bootstrap, it was used besides Ant Design.[15]
- 9. **sendgrid**, it is a cloud-based SMTP provider that allowed us to send email without having to maintain email servers. SendGrid manages all of the technical details.[16]

# 4.2 Authentication and Validation

Because Jobie is regarded as a middleman between job seekers and employers, each party must register on the platform in order to identify himself and have access to all of its features.

## 4.2.1 Login

In order to login to the website, you have to enter your a valid email address and a valid password. As seen in Figure 4.1

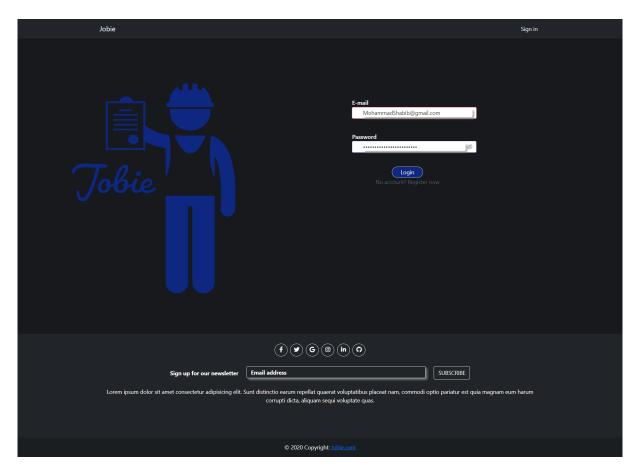


Figure 4.1: Login Form

# 4.2.2 Signup

To register on the website, you must provide certain information such as your username, email address, a password of at least seven characters, and the sort of user you are. Furthermore, whether you are an employee or a freelancer, you must select your gender. (see Figure 4.2 and 4.4)

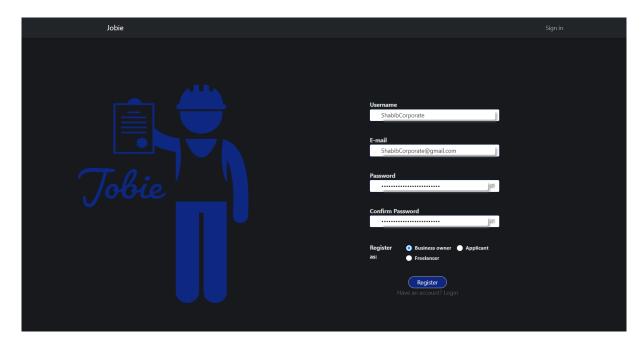


Figure 4.2: Business signup page

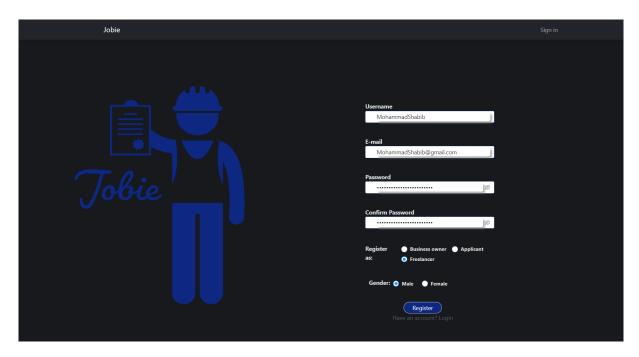


Figure 4.3: Employee/ Freelancer signup page

After successfully registering, a welcoming email message will be sent to your email address.



Figure 4.4: A welcoming Email message after a successful registration

#### 4.2.3 Validation

When a user attempts to login, the back-end validates the credentials; if they are invalid, the user is alerted, and if he attempts to register using an existing email address, he is also notified.

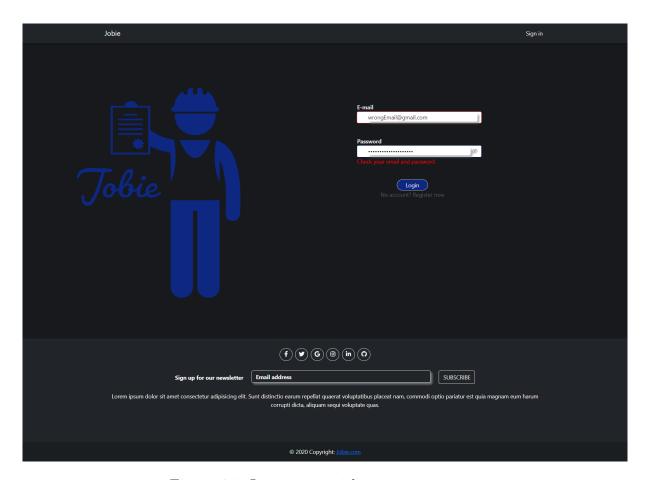


Figure 4.5: Login page with an error message

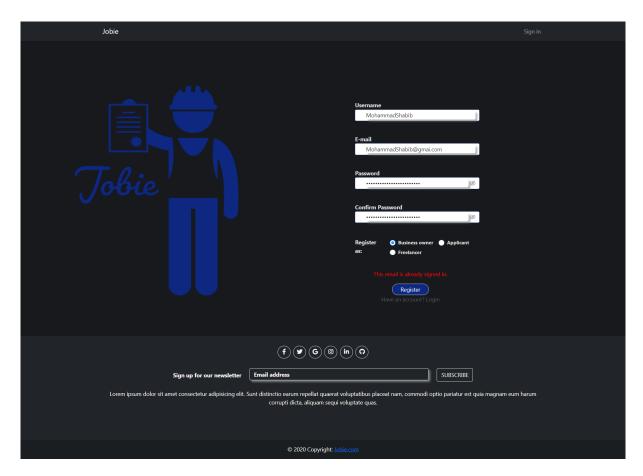


Figure 4.6: Signup page with an error message

# 4.3 Navigation bar

In Jobie, there are two versions of the navigation bar: one for logged-in users and another for unlogged-in users.

For unlogged users, the navigation bar has links to the website's home page and the signup page.



Figure 4.7: Jobie navigation bar for unlogged users

On the other hand, logged-in users will notice, in addition to the home page link, a button for accessing their profile, a button for applications, and a button to logout from the website.(see the next figure).



Figure 4.8: Jobie navigation bar for signed-in users

# 4.4 Home Page

When a user enters the website for the first time, he sees the home page, which includes a list of available applications. He may also search for firms or freelancers, or filter the results based on a location, topic name, or what the filtered item specializes in.

The listed job applications or users are ordered according to the user's interests, so an

The listed job applications or users are ordered according to the user's interests, so applications or users that share the user's interests will appear at the top of the list.

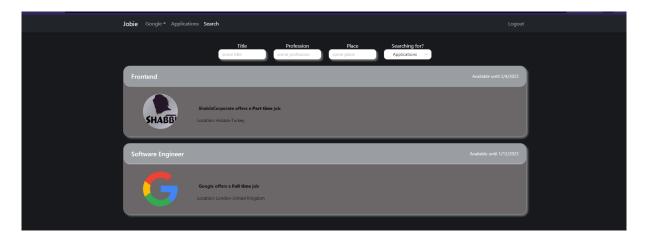


Figure 4.9: Jobie homepage with a list of available applications

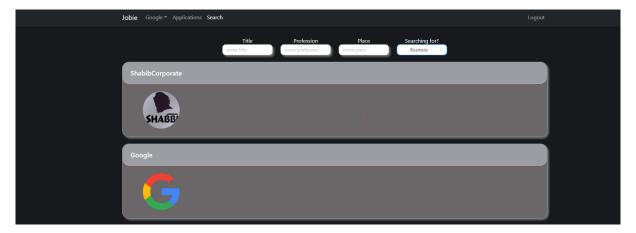


Figure 4.10: Jobie homepage with a list of firms



Figure 4.11: Jobie homepage with a list of freelancers

# 4.5 Profile page

This section will talk about the profile page and all the features in it.

To begin, if the user registered a new account and viewed his profile, his profile will be completed with needed basic information such as his email address and gender if he is an employee or freelancer.

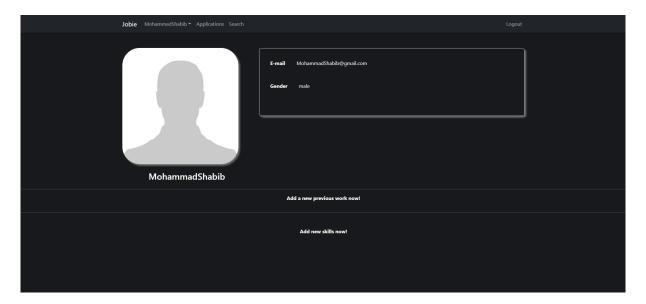


Figure 4.12: A new account profile

After filling out all of his information and uploading a profile image for him, his profile will seem more professional, similar to the following profile (Figure 4.13):

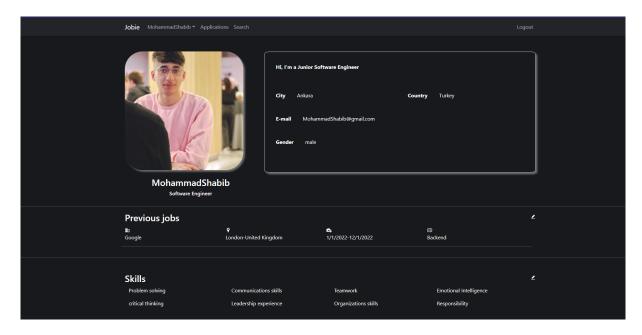


Figure 4.13: A completed profile

# 4.5.1 Editing the profile

Editing the profile information takes place on two pages: the Edit profile page and the Settings page, with each page allowing you to change specific data. On the edit profile page, the user may upload/alter his profile image, as well as modify his username, location (city and country), profession, bio, and gender if he is an employee/freelancer.

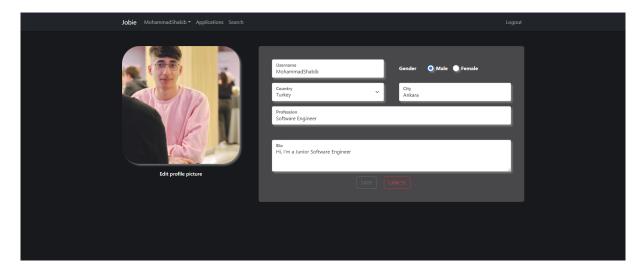


Figure 4.14: Editing the profile page of an employee/freelancer

However, the settings page allows the user to update and add a phone number, change the password (see Figure 4.15), or change the birthday if he was an employee or a free-lancer (See Figure 4.16).

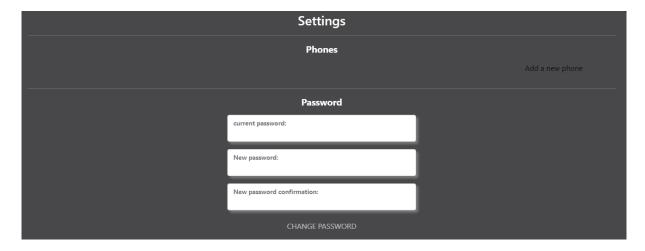


Figure 4.15: The settings page



Figure 4.16: A birthday changing option for the employees/freelancers

# 4.5.2 Previous jobs

Jobie allows users to add prior works by including the firm name with whom they worked, the location (which includes the city name and country name), their position in that job, and the time period of the work, as a result, the list of previous jobs appears in the profile, as shown in Figure 4.17.

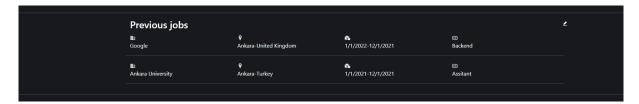


Figure 4.17: Previous jobs for a profile

To add a new previous job, the user can click the pen symbol in the previous job section, then the addition icon, as illustrated in Figure 4.18.

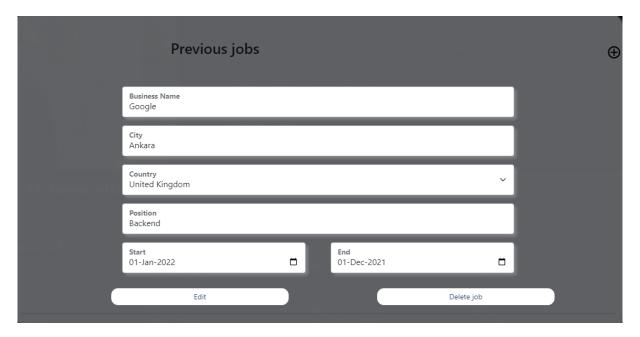


Figure 4.18: Adding a previous job

In addition to adding a new previous job, the user can edit or delete an existing previous job, as shown in Figure 4.19.



Figure 4.19: Editing an existing previous job

#### 4.5.3 Skills

A freelancer or an employee can add his skills to help other users better understand him, therefore the stated user skills will appear in his profile under the skills area, as shown in the figure below:

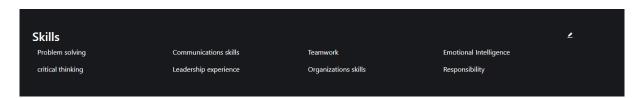


Figure 4.20: Listed user skills

He can add new skills by clicking the pen symbol and then selecting his skills, as illustrated in Figure 4.21.

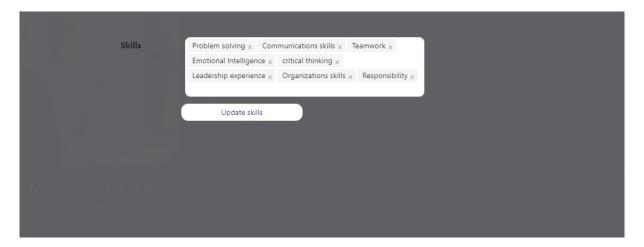


Figure 4.21: Selecting new skills

#### 4.5.4 Feedback

A freelancer may receive feedback and a rating on his work only from a former employer, therefore the employer visits the freelancer's profile and provides feedback.

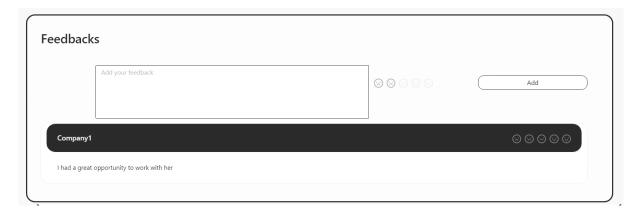


Figure 4.22: Giving a freelancer feedback

# 4.6 Job applications page

The applications page contains applications either published by an employer or submitted by a freelancer/employee. The user may view the applications and filter them by job location, job title, or job type.

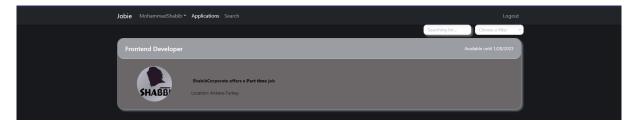


Figure 4.23: The applications page in a freelancer/employee account

If the user is an employer, he will see a button that allows him to add a new application, as shown in the next figure:



Figure 4.24: The applications page in an employer account

## 4.6.1 Adding a new application

This ability is only available to Business type users in order to publish new jobs. The standard job application should include a title, deadline for submissions, a brief description of the position, work type (full or part-time), job location, what field the job is regarded in, and contact information for the job owner (phone and email).

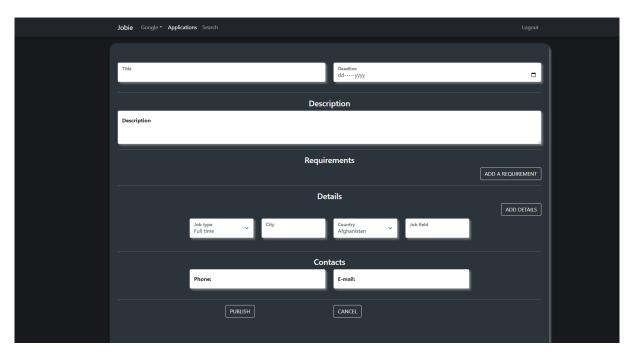


Figure 4.25: Adding a new application

By using the Add a requirement and Add information buttons, the employer may add new job specifications and details. see Figure 4.26

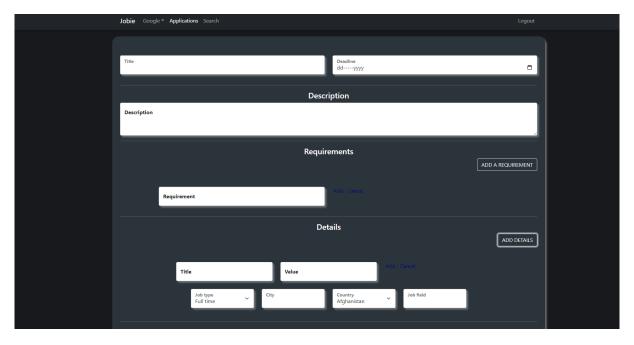


Figure 4.26: Adding a new application with requirements and details

## 4.6.2 Displaying an application

A user can view the entire job application by clicking on the application on the home page or the applications page. Depending on the user type, the page that shows the program differs, as follows:

#### 1. If the user was a freelancer, an employee or not signed-in

In this situation, an apply button will display, allowing the user to apply for the job. As illustrated in Figure 4.27

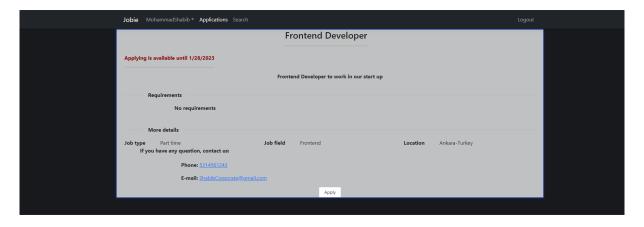


Figure 4.27: A job application

#### 2. If the user was the owner

In this case, the user can check any responses, update the job application, or delete it.

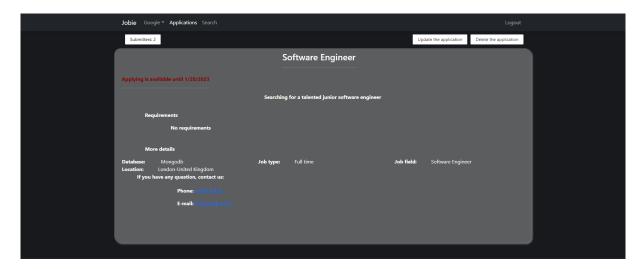


Figure 4.28: A job application

#### 3. If the user was of the Business type but not the owner

In this case, he can view the application only

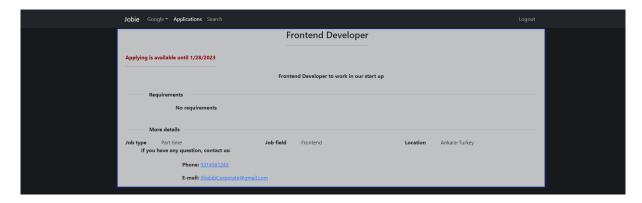


Figure 4.29: A job application

# 4.6.3 Updating an application

Jobie allows Business type users to update the available applications they have published by visiting the application and using the Update application button, as shown in Figures 4.30.

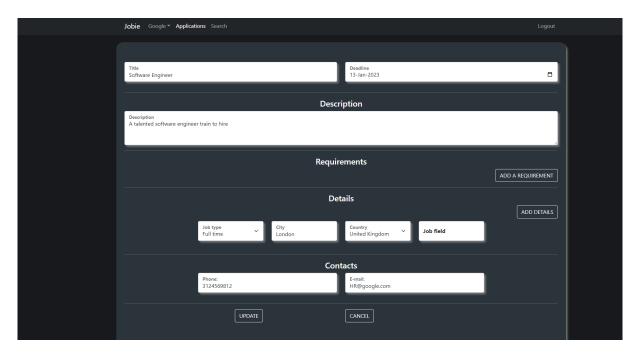


Figure 4.30: Updating an existing job application

## 4.6.4 Reviewing job application responses

The owner of a job application can review the responses to that application by clicking the Submitters button on the application page, and he can delete each response individually, as illustrated in Figure 4.61.

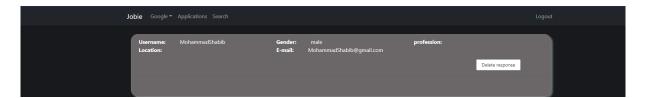


Figure 4.31: Responses on an application

## 4.6.5 Applying for a job

If the job application is still available, users can apply for it. When a user clicks the apply button, his basic information is automatically entered in the application form if he is logged in and remains registered; if he is not registered, he is sent to a page with the application form to manually fill in his data.

As previously said, if the user is not signed in, he will manually enter his data, which include his name, email address, phone number, skills, occupation, location, and gender.

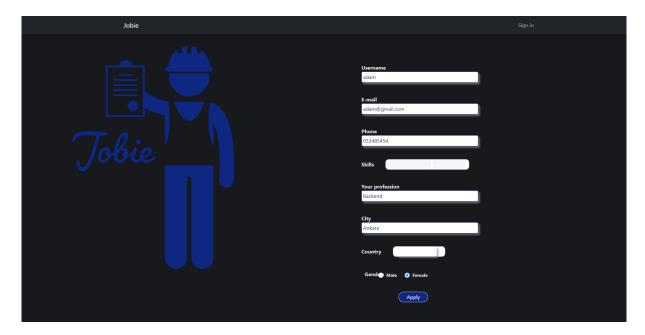


Figure 4.32: Job application form

# 4.7 Jobie as mobile application

# 4.7.1 Start page

When the user opens the application, it opens to the start page depicted in Figure 4.33. It has a login in button, a register button, and a Skip for now button that allows the user to enter the application without having an account.

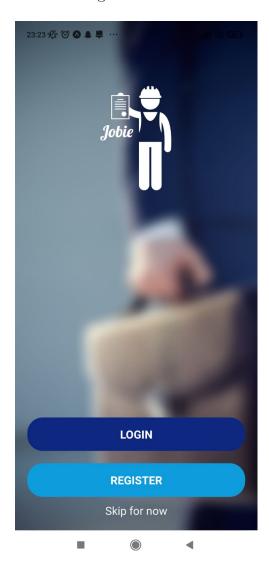


Figure 4.33: Home page

## 4.7.2 Registration and login page

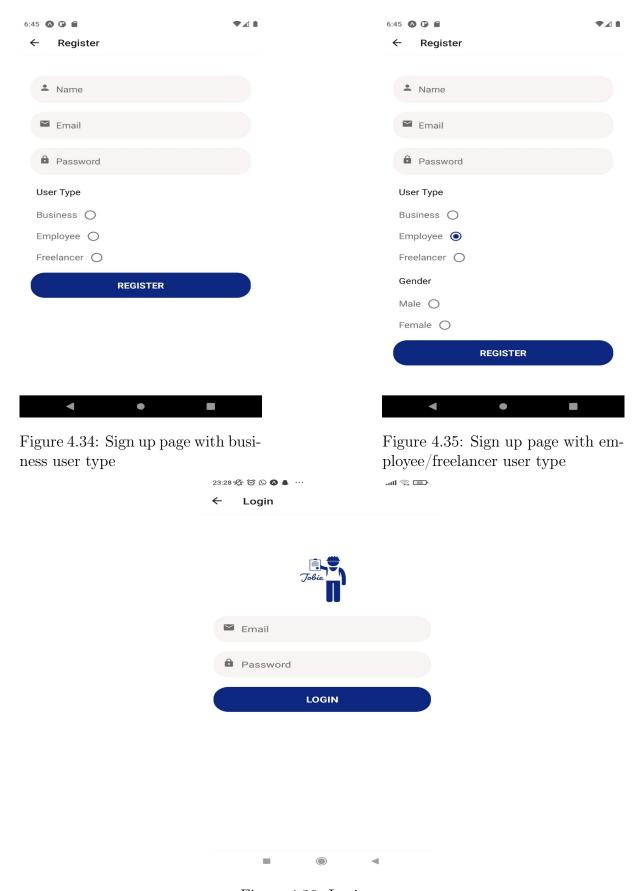


Figure 4.36: Login page

## 4.7.3 The navigation bar

In the Jobie application, there are two types of navigation bars: one for Business type users(see Figure 4.37) and another for other user types and unlogged-in users(see Figure 4.38). The Plus symbol in the Business Navigation bar is used to create a new job application, whereas the other icon in other user types is used to look for jobs or users. In addition to the middle icons, there is a feed button for seeing job applications and users, and an account button for viewing the user's account.



Figure 4.37: For Business user type



Figure 4.38: For freelancer/employee user type and unlogged-in users

If the user clicks the account button in the navigation bar, he will be taken to his account page, where he will be able to view his profile, view his responses on the offered job applications if he is a freelancer/ employee, or view his offered applications if he is a Business user type, as well as go to the settings and logout from the application. see Figures 4.39, 4.40 and 4.41 to see all possible user accounts.

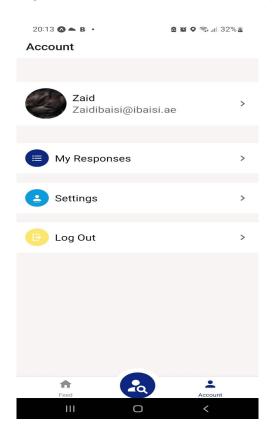


Figure 4.39: Employee/Freelancer account

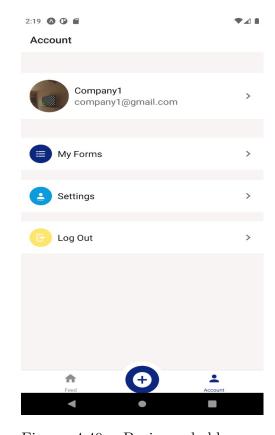


Figure 4.40: Business holder account

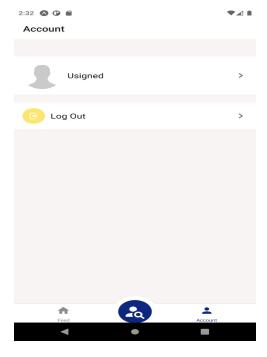


Figure 4.41: Unregistered user's account

# 4.7.4 Home page

The home page, as shown in Figures 4.42 and 4.43, shows all available job applications, and the user may search for people by using the search icon in the middle of the navigation bar.

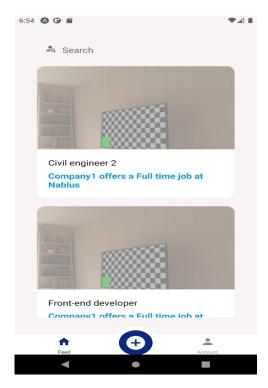


Figure 4.42: The home page for Business user type

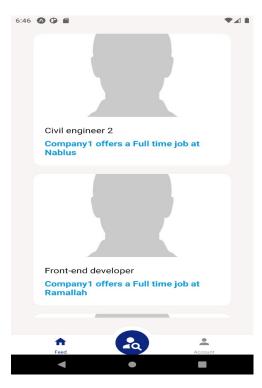


Figure 4.43: The home page for non-Business user types

#### 4.7.5 Profile

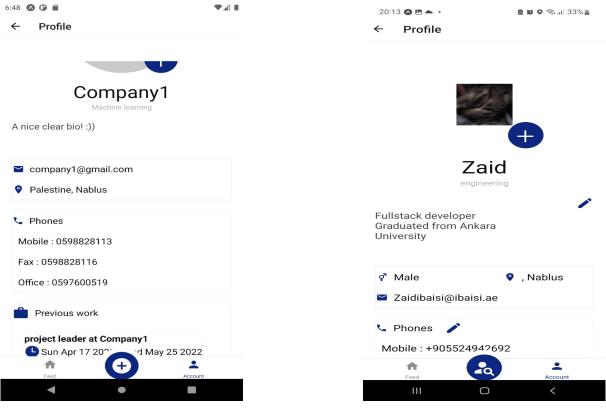


Figure 4.44: Business owner's profile page

Figure 4.45: Freelancer/employee's

Figure 4.46: Freelancer/employee's profile page(2)

# 4.7.6 Settings page

As illustrated in Figure 4.47, this page allows the user to change his profile and information by including an edit profile button, a security button, a contact button, and an edit prior jobs button. Figure 4.48 below shows the profile editing screen, which allows the user to alter his basic information.

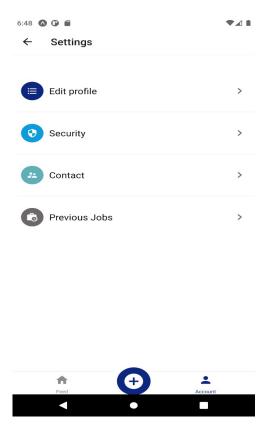


Figure 4.47: Settings page

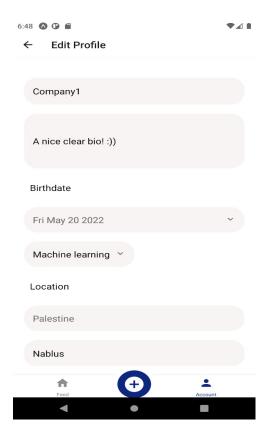


Figure 4.48: Edit profile page

When the user presses the security button, he can change his password as shown in Figure 4.50, and if he presses the Contact button, he can change his phones as shown in Figure 4.49.

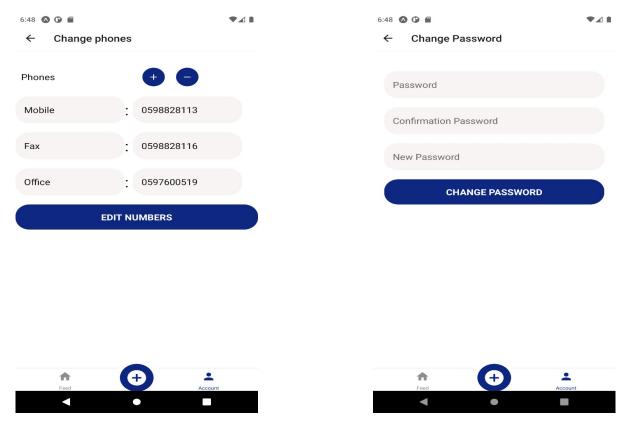


Figure 4.49: Contact page

Figure 4.50: Security page

Finally, if he clicks on the previous jobs button, he can add new previous works or update or delete existing works as shown in Figure 4.51.

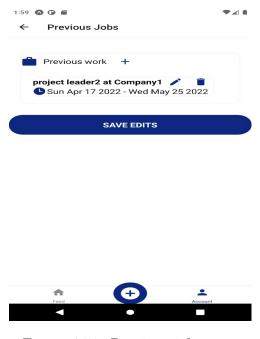


Figure 4.51: Previous jobs page

## 4.7.7 Job applications pages

#### - Adding a new application

As previously said, only Business users may add job applications; thus, if they need to add a new application, they can click the Plus button in the navigation and they will be taken to a page where they can do so. (To view that page, see Figure 4.52 & 4.53).

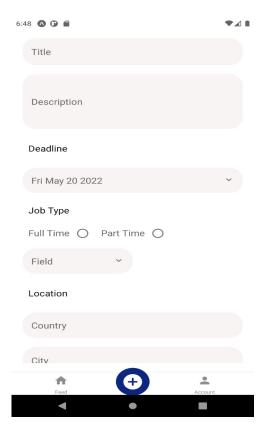


Figure 4.52: Adding an application(1)

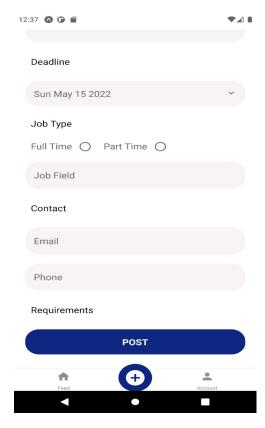


Figure 4.53: Adding an application (2)

#### - Displaying applications/responses

Jobie allows users to view their applications if they were job holders or their responses on the provided applications if they were freelancers or employees by heading to the account page and clicking the My Responses/ My Forms button. see Figures 4.54 and 4.55

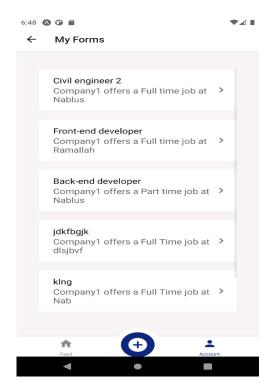


Figure 4.54: The business holder forms

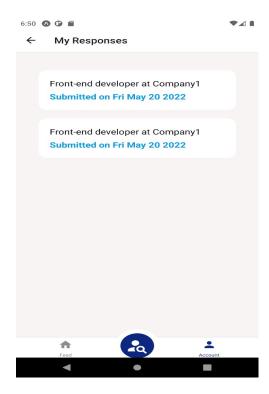


Figure 4.55: The employee/free-lancer responses

#### - Displaying an application

When an application is published, all users of all types can view it, as illustrated in Figures 4.56, 4.57 and 4.58.

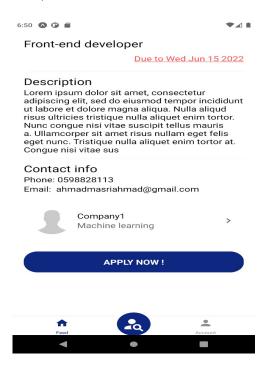


Figure 4.56: If the user was a freelancer, an employee or not signed-in



Figure 4.57: If the user was of the Business type but not the owner



Figure 4.58: If the user was the owner

When the user owns the application, he has the ability to modify, remove the application, and see the submitters. When he hits the submission button, as shown in Figure 4.58, he would be taken to a page that displays the submissions, as shown in Figure 4.61.

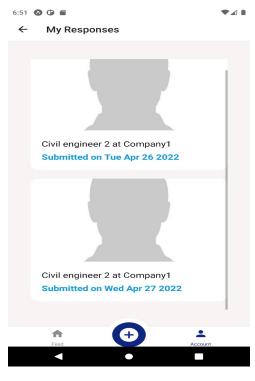


Figure 4.59: Responses on an application

#### - Displaying a response

Only the owner of the response and the owner of the job application can see the response details by clicking on it

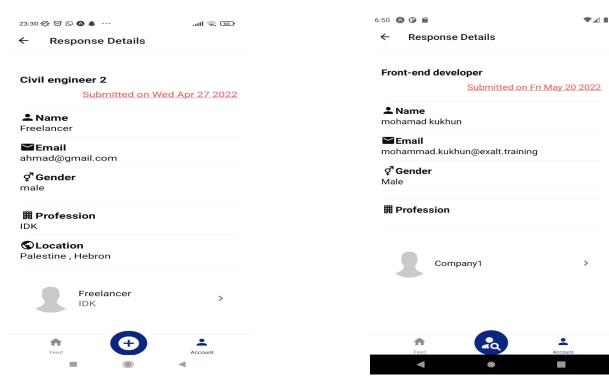
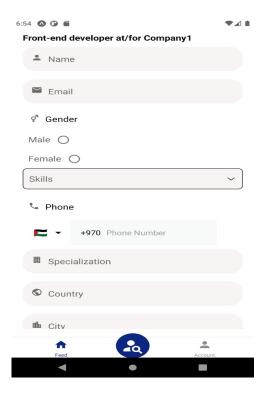


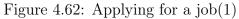
Figure 4.60: Freelancer/employee sees his response

Figure 4.61: An application owner sees freelancer/employee's response

#### - Applying for a job application

When an user applies for a job, if he is using his account, all he needs to do is hit the Apply Now! button, but if he is not registered, he will be taken to a page where he may fill out his information and skills. Figures 4.62 & 4.63 show the applying form





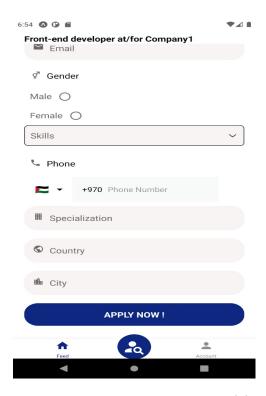


Figure 4.63: Applying for a job(2)

A message will display in the center of the screen verifying the response's success, as shown in Figure 4.64.

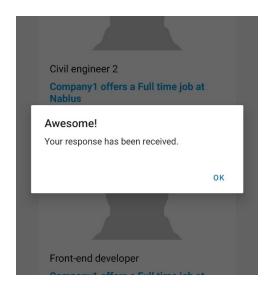


Figure 4.64: A confirming message

# Chapter 5

# Results & Discussion

#### 5.1 Results

Jobie is a platform with a website and a mobile app that allows users to perform the following:

- 1. Visit the website and use all of its features without creating an account.
- 2. Creating an account and personalizing it by entering basic information such as an email address, a bio, and a phone number.
- 3. Adding prior works and skills to their profile to assist other users in recognizing him.
- 4. Publish job applications, update existing applications, and delete applications.
- 5. Companies that have worked with freelancers providing feedback
- 6. Applying for job applications by freelancers and employees users.

#### 5.2 Discussion

Jobie most likely supplied the following:

- 1. Providing an easy-to-use platform for everyone, regardless of their technical and scientific knowledge.
- 2. Reducing the societal level of unemployment.
- 3. Increasing employees' and jobless people's awareness of the labor market and the firms that operate within it.

# Chapter 6

# Conclusion & Future Work

## 6.1 Conclusion

Jobie is an employment service platform that seeks to increase the number of employed people in society while decreasing the number of jobless people. There are numerous alternatives in the local and worldwide marketplaces, but most of them resemble newspapers and are difficult to use, therefore Jobie was meant to be as simple as possible. Furthermore, many options do not include persons who lack technical and computer abilities.

Optimistically, Jobie has served the purpose for which it was designed. We had hoped to incorporate a modest set of minor features into the project, but it was omitted due to lack of time and focus on more important features; hopefully they will be added in the future

## 6.2 Future Work

There are various areas that Jobie might improve, including:

- 1. Using machine learning on the platform to improve the platform's understanding of its users.
- 2. Improving the communication mechanism between users, such as introducing a chat system.

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