

# SW Engineering CSC648/848 Spring 2022 Section M

8 March 2022

## Milestone 2 – More Detailed Requirements, Specs, Architecture, UI mock-ups and Vertical SW prototype

Team 2

Team Lead: Zubin Kanga (zkanga@sfsu.edu)

Front End: Cat Tuong Vu, Gurinder Singh, Sebastian Wcislo

Back End: Anudeep Katukojwala, Brandon Butler, Zubin Kanga

GitHub Master: Sebastian Wcislo

### History Table

<b>Submitted</b>	8 March 2022
<b>Revised</b>	

## **1. Functional Requirements – prioritized – Gurinder Singh**

### **What Does it Do?**

This app allows users to search for job listings posted by companies looking for help.

This has an emphasis on SFSU students interested in tech.

### **Functions on the basis of priority**

The numbering is based on how the following requirements appeared in milestone 1's functional requirements. There were eight functional requirements in milestone 1, and so we added some additional requirements that we thought were required and would help make our website unique.

### **1 – must have**

The following requirements detail the essential (must have) functionality required in our website as listed in the final project description.

#### **Actor – Users:**

##### **1. Job Searching**

1.1 - Users shall be able to search for jobs based on their skills and passion.

1.2 - Users shall be able to search and filter through job listings based on tech areas, job positions, and skills.

##### **2. Account Management**

2.1 - Users shall be to register their accounts with the app, log into and log out of their accounts to gain access and deny access from the app, and manipulate their profiles to give their basic information, job experience, and general information on their personalities for other users and posters can see.

##### **9. Technology Trends For 2022**

9.1 - Users shall be able to find technology trends for 2022.

10. Specific to SFSU Students

10.1 - Website shall be specific to SFSU students looking for a job in tech.

10.2 - It shall minimize their job-search-related struggle by providing them with easy-to-use website with capabilities that are created specifically for SFSU students.

11. Support for Tech Companies

11.1 - Tech companies shall be able to post in 9 areas: Artificial Intelligence and Machine Learning, Robotic Process Automation (RPA), Edge Computing, Quantum Computing, Virtual Reality and Augmented Reality, Blockchain, Internet of Things (IoT), 5G, and Cyber Security.

11.2 - Tech companies shall be able to specify Job titles, descriptions, and skills required for a certain job.

**Actor – Admin:**

6. Notifications

6.1 - Users shall be able to register and get alerts for matching job interests.

6.2 - Application shall send the users emails or phone notifications when they get information from the app when they are not directly using the app.

12. Administrator Capabilities

12.1 - Website shall be able to trigger the matching job alerts to the corresponding users.

13. Email Confirmation

13.1 - Application shall require users to verify their email address upon registration.

**2 – desired**

The following requirements detail the functionality that makes our website unique and helps separate us from the competition.

**Actor – Users:**

3. Profile Sharing

3.1 - Profiles should be allowed to be easily shared through text messages, emails, and through messages on the app with ease.

7. Messaging

7.1 - Users should be able to easily interact with Users and Posters.

**Actor – Admin:**

4. Claim Verification

4.1 - There should be a claim verification feature for admins to review as they see fit.

5. Spam Control

5.1 - Spam posting and other malicious posts should be mitigated and controlled.

**3 – opportunistic**

The following requirement details the functionality that would be great to have but is not required.

**Actor – Users:**

8. Interview Prep

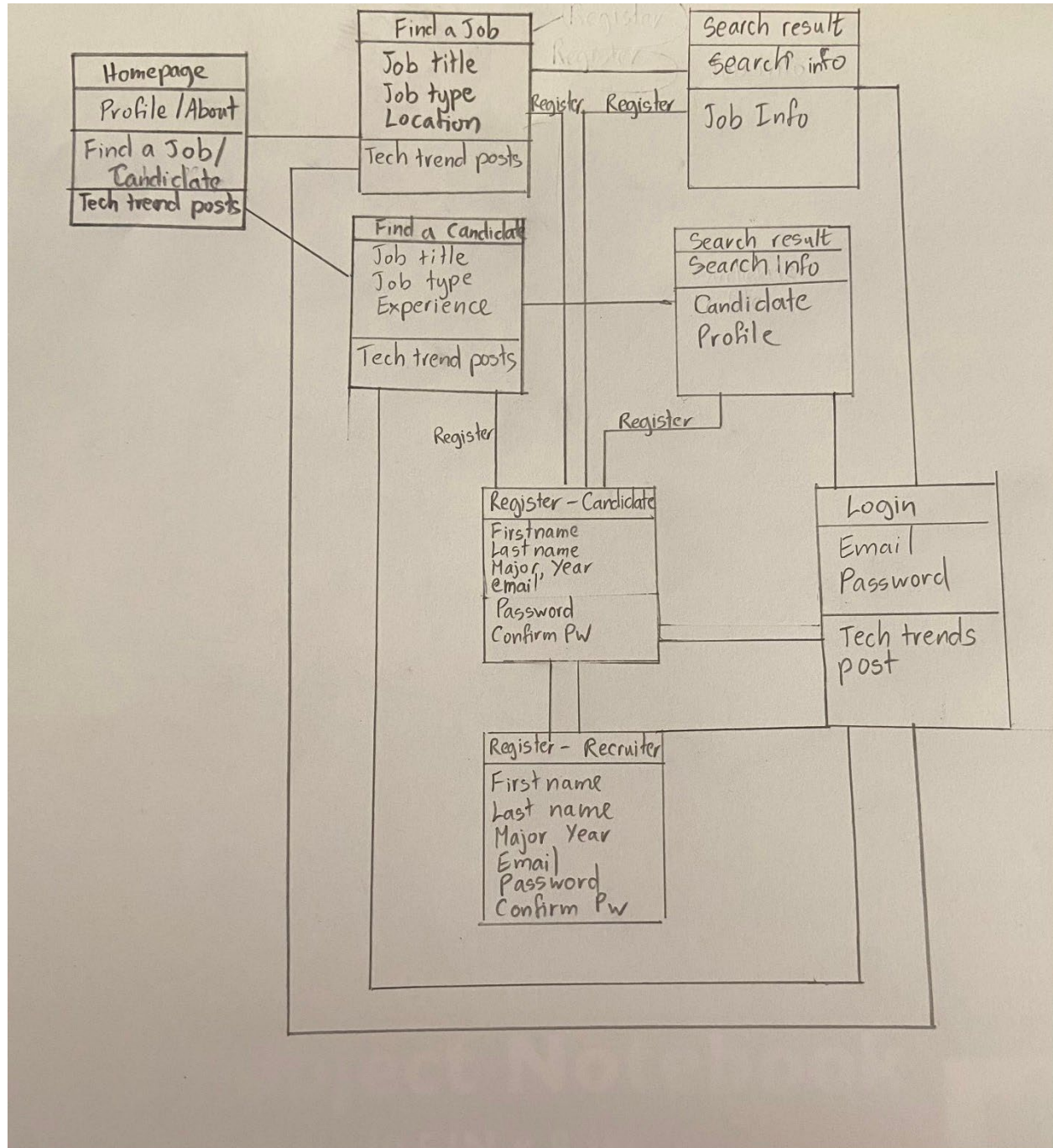
8.1 - Users should be able to post advice for the companies interviews and even link videos from YouTube with examples.

**Data Description**

Users and Posters

- a. Users – people who are using the app to search for jobs and interact with other users to gain insight on the job market.
- b. Posters – the companies that post the job listings for the Users to apply for and reach out for better insight on what are the requirements and expectations for the job.

## 2. UI Mockups and Storyboards (High Level Only) - Cat Tuong Vu



## Homepage

Candidate	Homepage	Recruiter
<div><p>Tech Connect</p><p><a href="#">Home</a> <a href="#">Profile</a> <a href="#">About</a></p><p>There are so many uncertainty in our ever-changing world, Let's make connected something we're certain about</p><div><div>Find a Job</div><div>Find a Candidate</div></div><div><div>Job Title</div><div>Intern/full time</div><div>Location</div></div><div>Search</div><div>No account? <a href="#">Register</a> to get notify <a href="#">Login</a></div><div><div>Tech Trends Post</div><div>Tech Trends Post</div><div>Tech Trends Post</div><div>Tech Trends Post</div></div></div>		<div><p>Tech Connect</p><p><a href="#">Home</a> <a href="#">Profile</a> <a href="#">About</a></p><p>There are so many uncertainty in our ever-changing world, Let's make connected something we're certain about</p><div><div>Find a Job</div><div>Find a Candidate</div></div><div><div>Job Title</div><div>Intern/full time▼</div><div>Experience ▼</div></div><div>Search</div><div>No account? <a href="#">Register</a> to get notify <a href="#">Login</a></div><div><div>Tech Trends Post</div><div>Tech Trends Post</div><div>Tech Trends Post</div><div>Tech Trends Post</div></div></div>

Candidate

Recruiter

## Search Result Page

Tech Connect	Home	Profile	About
Search Result			
<div>Find a JobFind a Candidate</div>			
<div>Job TitleIntern/full timeLocation</div>			
<div>Search</div>			
No account? <a href="#">Register</a> to get notify <a href="#">Login</a>			
Job Info		Job Info	
Job Info		Job Info	

Tech Connect	Home	Profile	About
Search Result			
<div>Find a JobFind a Candidate</div>			
<div>Job TitleIntern/full time▼Experience▼</div>			
<div>Search</div>			
No account? <a href="#">Register</a> to get notify <a href="#">Login</a>			
Candidate Profile		Candidate Profile	
Candidate Profile		Candidate Profile	

Candidate

Recruiter



## Register Page

Tech Connect	Home	Profile	About
<div>Register</div> <div><div>Candidate</div><div>Recruiter</div></div> <div><div>First name</div><div>Last name</div><div>Major ▼ Year ▼</div><div>Email</div><div>Password Confirm Password</div><div>Register</div><div>Already have an account? <a href="#">Login</a></div></div>			
<div>Tech Trends Post</div> <div>Tech Trends Post</div>			

Tech Connect	Home	Profile	About
<div>Register</div> <div><div>Candidate</div><div>Recruiter</div></div> <div><div>Company Name</div><div>Email</div><div>Actively Looking For</div><div>Password Confirm Password</div><div>Register</div><div>Already have an account? <a href="#">Login</a></div></div>			
<div>Tech Trends Post</div> <div>Tech Trends Post</div>			

Candidate

Recruiter

## Login Page

Tech  
Connect

[Home](#)[Profile](#)[About](#)

Login

Email

Password

Register

No account? [Register](#) to get notify  
[Login](#)

Tech Trends  
Post

Tech Trends  
Post

Tech Trends  
Post

Tech Trends  
Post

### **3. High Level Architecture, Database Organization – Anudeep Katukojwala**

- 1) Describe the main database schema /organization (high level), e.g. list main DB tables (e.g. their titles) and items in each DB table

ENUM name: TECH\_AREA

AiAndML, RoboticProcessAutomation, EdgeComputing, QuantumComputing, VirtualReality, AugmentedReality, Blockchain, InternetOfThings, FiveG, CyberSecurity are all the tech areas

Main Tables that would be used are as below:

Table name: **company**

Attributes in this table:

id: INTEGER

name: VARCHAR

password\_hash: VARCHAR

description: TEXT

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Table name: **jobs**

Attributes in this table:

id: INTEGER

job\_title: VARCHAR

job\_type: VARCHAR

requested\_hours: INTEGER

tech\_area: TECH\_AREA

experience\_level: VARCHAR

city: VARCHAR

salary: INTEGER

description: TEXT

min\_qualifications: TEXT

preferred\_qualifications: TEXT

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Table name: **student:**

Attributes in this table:

id: INTEGER

city: VARCHAR

name: VARCHAR

password\_hash: VARCHAR

email: VARCHAR

phone: INTEGER

highest\_education: VARCHAR

passion: TECH\_AREA

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Table name: **certifications**

Attributes in this table:

id: INTEGER

name: VARCHAR

description: TEXT

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Table name: **skills**

Attributes in this table:

id: INTEGER

name: VARCHAR

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Table name: **roles**

Attributes in this table:

id: INTEGER

name: VARCHAR

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- 2) Media storage: Decide if images and video/audio will be kept in file systems or in DB BLOBs (decision on file vs. BLOBs must be made by the end of M2). Describe any other special data format requirements like for video/audio/GPS etc.

- i) Multimedia files will be stored in **File Systems**
  - ii) Preferred Image format: **JPG**
- 

- 3) Search/filter architecture and implementation:

- i) What will be the alg/SW for search;
  - Standard internal mysql search algorithms will be used.
- ii) How will you organize search items for the user;
  - a. User can search with empty entry to display all the jobs available
  - b. User can search using string values to display the job titles matching the entered string

- c. Various filters will be available based on below terms to modify the search
- Field > Select interested field to display the jobs related to that field.
  - Company > Select preferred company name to display the jobs that are posted by that company.
  - Location > Select the preferred job location to display the jobs at that location.

iii) What DB terms will be searched

- a. Job Title
- b. Company Name

iv) How it will be coded and organized in the DB

The organization of data is done as described in the answer for the first question. Here we will be using SQL and its queries in the code as the major tool for searching and sorting the data to output the requested data to the user.

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4) Your own APIs (if any): Describe and define at high level any major APIs that you will create other than standard ones provided by tools and frameworks you use

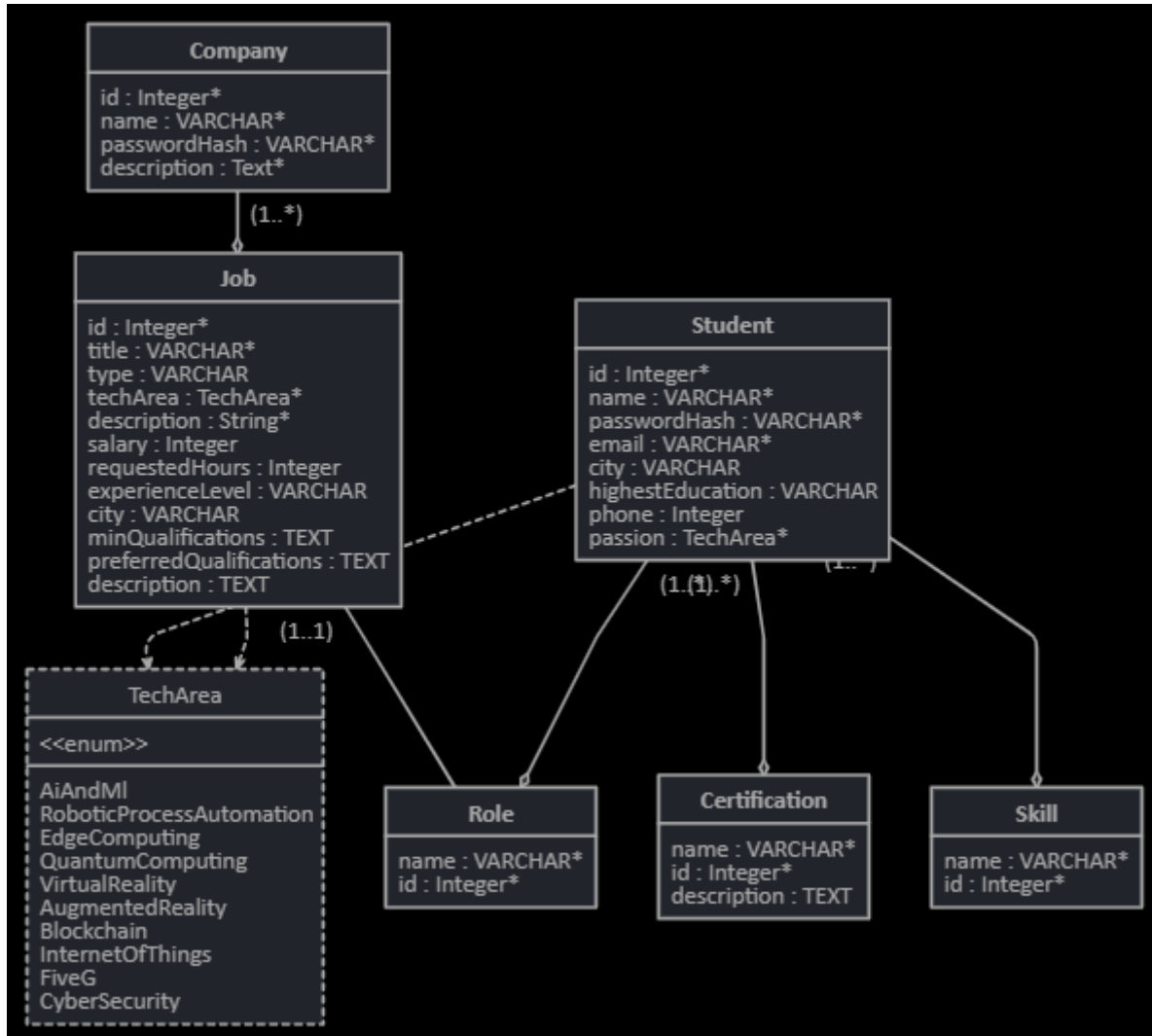
- i) Right now, we have no plans to implement our own APIs and will be using the APIs provided by the frameworks.

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5) Describe any significant non-trivial algorithm or process if any (like rating, ranking, automatic prioritizing of items etc.)

- i) All the algorithms we will be using would be of standard searching and sorting algorithms and none of the non-trivial algorithms would be used.

#### 4. High Level UML Diagrams - Zubin Kanga



## **5. Identify actual key risks for you project at this time – Sabastian Wcislo**

### **Time management risk**

- While we are all working on the group project, it may be difficult to find the time for it. Our team lead has a new job, all of us have more than one class and some of us work as well. This can definitely cause some time management or scheduling issues. But we face this by maintaining deadlines and being responsible about these deadlines. These deadlines have been easier to face because we have been meeting early and consistently.

### **Security risk**

- Security will always be a risk to the users, and we are considering to look more into the matter. Simple things such as making functions hide passwords or usernames from the inspect window, or looking into using a vpc/vpn to protect our database will be good first steps into tackling this issue.

### **Budget risk**

- Given the guide lines of the project, we are given 0 budget. This might be a cheesy way to put it, but time is money in this case. We must maintain meeting deadlines while learning from each other and the project. If an actual budget is to ever become involved, we would have to arrange a team meeting to discuss the matter.

### **Skill risk**

- While we are all capable and ready to work on our project, some parts of this project are completely new to us as students. For example, adhering to a basic Github naming convention or collaborating on specific parts of the project. We all have different backgrounds and acknowledge this, so in order to help ease this issue we are doing a



really transparent style of communication where we simply call someone out when necessary or have zero problems asking for help.

## **6. Project Management - Zubin Kanga, Cat Tuong Vu, Anudeep Katukojwala.**

### **Cat Tuong Vu:**

As a front-end lead in this milestone 2, not only focusing on writing the search webpage, it is also important to manage my frontend team to cooperate with the backend in “high level architecture and database organization”. We first come up with the www platform for a search webpage which solely written by html, css, and javascript. After getting the approval from all the team members, our next step is working to connect the search page with the database so that the tool works as professor’ requirements, such as, sorting and narrowing down the search result, and displaying categories. Besides, it is also crucial to design the vertical layout of the webpage, which will follow based on the bullet 2 in this milestone, “UI mockups and storyboard”.

### **Anudeep Katukojwala:**

As a back-end lead for this project, I have distributed the work among the back-end team, to complete the vertical prototype. We have planned to use node.js and express.js to retrieve the relevant information from the database and give it for the front-end to display on the search results page. For M2 and further milestones both the front-end lead and back-end lead planned to discuss on how to connect the front-end and back-end. We plan to assign one in front-end team and one in back-end team to make the connection as smooth as possible.

For the task management we plan to use “Jira” to keep track of who is working on what feature or task. This way we could reach out to that particular person if we need further information on that particular task.

### **Zubin Kanga:**

As project lead, my role in assigning the work for vertical prototype was minimal. I simply ensured that the front-end and back-end leads met to coordinate the required parts of the vertical

prototype while ensuring they had the information needed to complete their goals and made a logical path forward to completing the constituent parts in a timely manner. As for the rest of the project it was relatively simple, I broke down the work into its constituent parts, assigned people part (letting those with a preference pick first), and helped as needed to make sure things were completed in a timely fashion.