



**SAN JOSÉ STATE**  
**UNIVERSITY**

## **Job Board**

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## **Motivation**

Many students in our school are struggling hunting for a desirable job recently. Some of them want to find an internship in summer which allows them to put what they learned in class into practice, while others are seeking for a full-time job after graduation. On the other hand, many companies also need to find some excellent employees to help them to extend the market. Under this circumstance, we develop a platform for both job seekers and companies using Spring framework. In the job seeker part, they can search jobs posted by companies and apply for them after that. In the company part, they can post a job in our website and then select the applicants they want.

## **Introduction**

Job Board is an online web platform for companies and job seekers. Using this platform companies can post the job and job seekers can apply for those jobs. Using this app the job seekers are able to search for apply for the open positions on the portal, update his personal information, information about his skillset and information about his work experience. While searching for the open positions user has options to search the jobs using filters like company name, location, salary range. Job seeker can also mark positions as interested. To avoid duplication in the applications user will not be able to apply for the same job twice. Job seeker can also accept or reject interview invitations. Job seeker will also get an update through emails once he has applied for the job.

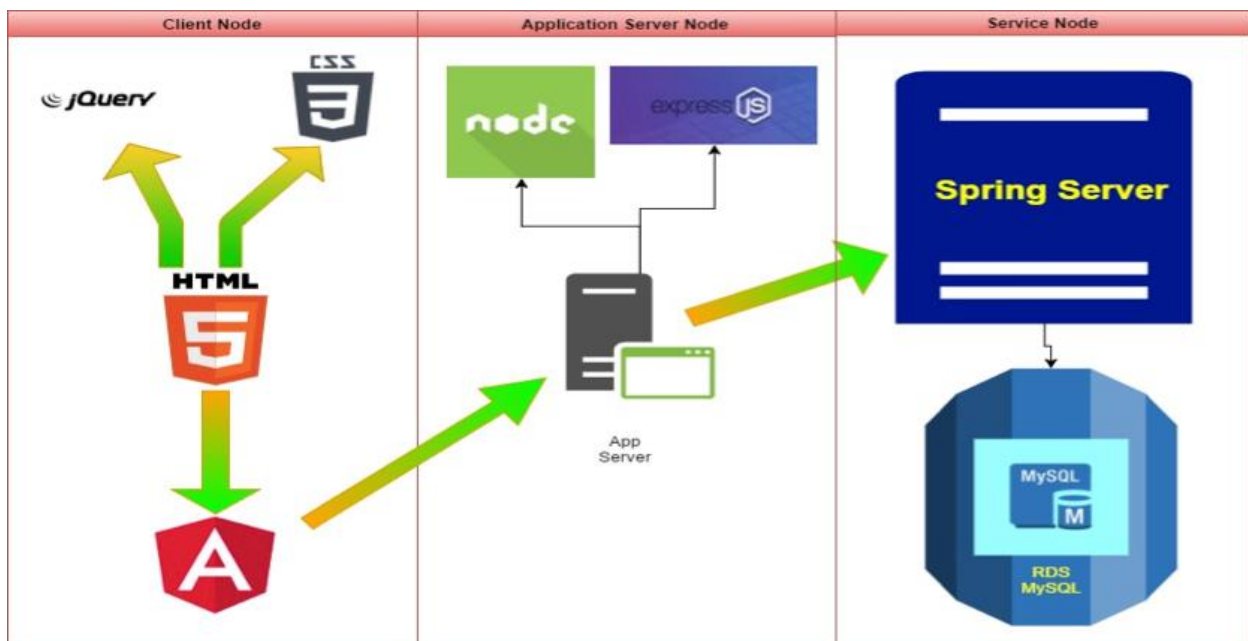
Using this job board companies will be able to post their information, will be able to upload open positions, view all the candidates which have applied to the jobs, cancel the positions. Companies will also be able to see the applicants which has applied for the jobs and download their resumes.

The application is hosted on ec2 and database is hosted on RDS MySQL. The application is developed with MVC architecture style and REST.

# High level and component level design

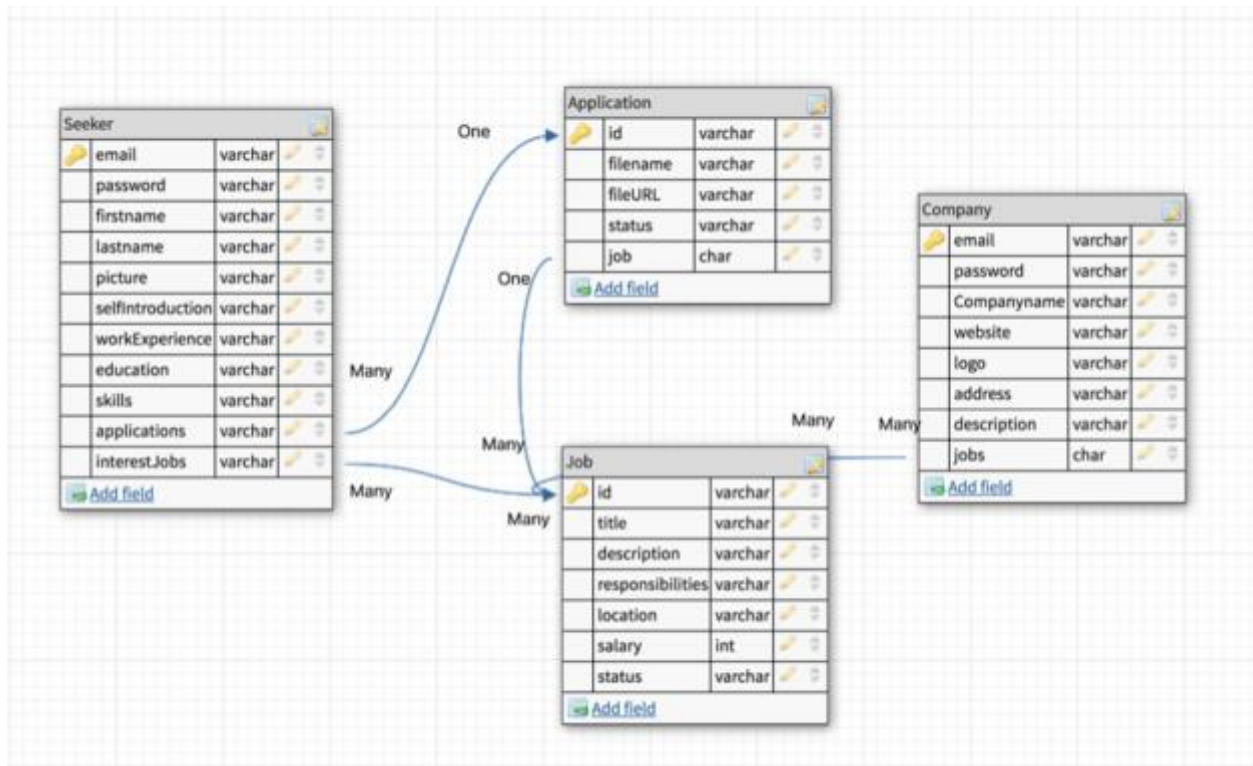
## High Level Design

The whole project can be divided into 4 parts, which are client, application server, backend server and MySQL database. In the client part, we use HTML, CSS and AngularJS. In the Application Server part, we use node.js to route the http request from the client side to the Spring backend server part. The spring backend part mainly focuses on the business logic of the whole project. Finally, we use MySQL as database.



## Component Level Design

### 3.2.1 Database Model:



There are 4 tables in total, which are Seeker, Application, Job and Company. Here are the relationships between them:

- The relationship between Seeker and Job is ManyToMany
- The relationship between Application and Seeker is OneToMany
- The relationship between Application and Job is OneToMany
- The relationship between Job and Company is ManyToMany

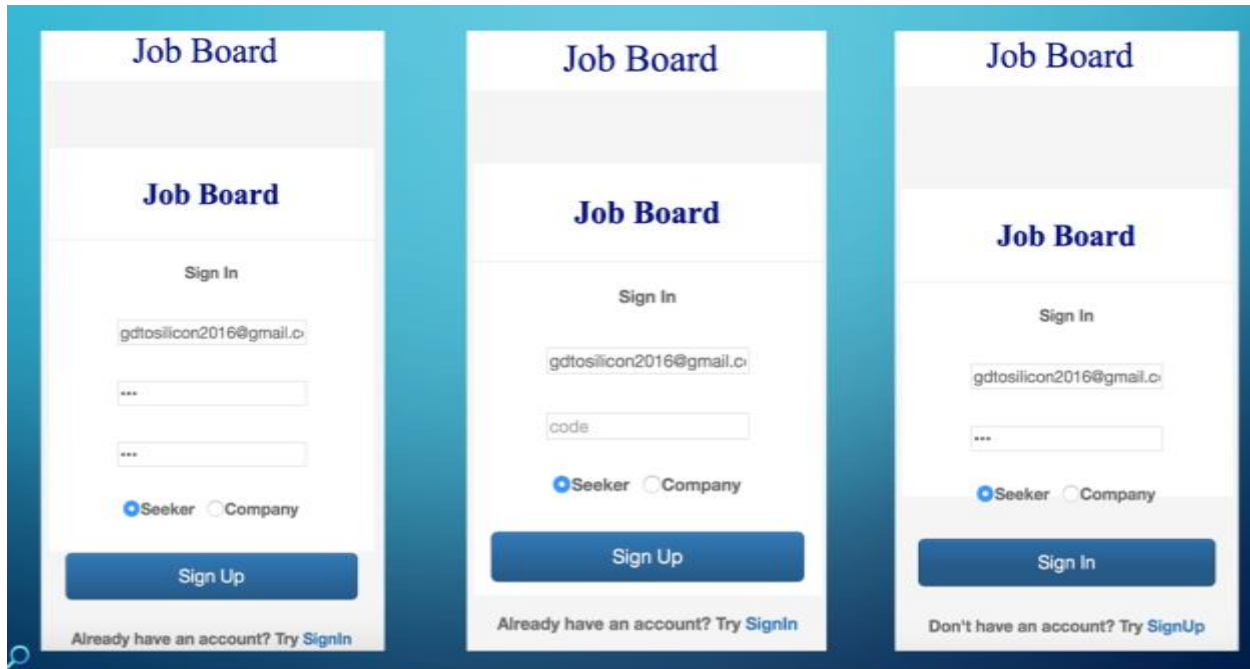
## Technology choices

1. **Application Framework** : Spring MVC
2. **ORM Framework** : Spring Hibernate
3. **Application Persistence** : MySQL Database,RDS,JPA,JTA
4. **Cloud Deployment** : Amazon EC2, Autoscaling Group, Load balancer
5. **Front End Development** : HTML5, CSS, AngularJS
6. **Security**: MD5 password encryption

## Description of features with final screenshots

### 5.1 Features for the demo

#### 5.1.1 Sign In and Sign Up page



#### 5.1.2 Job Seeker file creation

The image shows a screenshot of a web application interface for creating a job seeker profile. The page has a header with 'Job Board' on the left and 'Account' and 'Sign Out' on the right. The main content area is divided into two columns. The left column contains a sidebar with 'Search', 'Registration', and 'Introduce' links, and a profile picture placeholder. The right column contains a form with the following sections:

- First Name:** Input field with 'John'.
- Last Name:** Input field with 'Kumar'.
- Self Introduction:** Text area with 'Passionate developer looking for exciting opportunities.'
- Work Experience:** Text area with '5 yrs experience working as Software engineer'.
- Education:** Text area with 'Masters in Software Engineering'.
- Skills:** Text area with 'Java, C++, MySQL'.

At the bottom of the form are 'Cancel' and 'Update' buttons.



### 5.1.3 Job Seeker searches for a position based on keyword

Job Board Account Sign Out

**Search**

Application

Interests

Software	Name	Location	min	max	Search
Location:	San Jose	Salary:	1220000		
Title:	Software Development Engineer	Responsibilities:	Development, MEAN Stack		
Location:	Santa Clara	Salary:	40000		
Title:	Software Intern I	Responsibilities:	CI/CD Java Javascript AngularJS HTML JQuery		
Location:	San Jose	Salary:	150000		
Title:	Software Engineering	Responsibilities:	Produce Proof of Concept definition and documentation		
Location:	Santa Clara	Salary:	50000		
Title:	Software Intern II	Responsibilities:	CI/CD Mean Stack		
Location:	Santa Clara	Salary:	90000		
Title:	Software Engineer in Test	Responsibilities:	Testing the software developed		
Location:	San Francisco	Salary:	30000		
Title:	Software Engineer	Responsibilities:	MEAN stack Java Spring Hibernate MongoDB CI/CD		

First Previous **1** Next Last

### 5.1.4 Job Seeker applies for a job and then get an email notification

**Job Description**

Title: Intern

Description: 3 months summer internship

Responsibilities: Coding

Location: San Francisco

Salary: 40000

**Seeker Info**

First Name: sam

Last Name: lin

Email: 153638921@qq.com

**Application**

Apply with Resume

Choose file  resume

**Submit**

**Apply Successfully** ☆

发件人: gdtosilicon2016 <gdtosilicon2016@gmail.com>

时 间: 2017年5月18日(星期四) 上午9:12

收件人: Ben <153638921@qq.com>

Thank you for applying the position, we will contact you if there is a match

### 5.1.5 Company can edit its profile at any time

Job Board

AccountSign Out

jobs

Post a Job

Name:OracleWebsite:www.oracle

Logo imageURL:/oracle.png

Address:Redwood City

Description:Oracle offers a comprehensive and fully integrated stack of cloud applications, platform services, and engineered systems. With more than 400,000 customers—including 100 of the Fortune 100—in more than 145 countries

CancelUpdate

### 5.1.6 Company Dashboard to view all the jobs:

Job Board

AccountSign Out

jobs

Post a Job

Location:	Redwood City	Salary:	100000
Title:	Senior Consultant	Responsibilities:	2-5 years of overall experience in relevant functional or technical roles. Undergraduate degree or equivalent experience. Product or technical expertise relevant to practice focus.
Location:	San Jose	Salary:	150000
Title:	Software Engineering	Responsibilities:	Produce Proof of Concept definition and documentation

## 5.2 Features after the demo

### 5.2.1 Job Seeker can mark/unmark any open position as interested

Job Board Account Sign Out

Search

Application

Interests

Key Words

Name

Location

min

max

Search

Location:	Remote	Salary:	20000	Interested
Title:	Marketing Intern	Responsibilities:	Microsoft Office Salesforce	
Location:	San Francisco	Salary:	30000	Interested
Title:	Software Engineer	Responsibilities:	MEAN stack Java Spring Hibernate Mongodb CI/CD	
Location:	Santa Clara	Salary:	40000	Interested
Title:	Software Intern I	Responsibilities:	CI/CD Java Javascript AngularJs HTML Jquery	
Location:	Santa Clara	Salary:	50000	Interested
Title:	Software Intern II	Responsibilities:	CI/CD Mean Stack	

### 5.2.2 Job Seeker can view his/her interest jobs in the interest list

Job Board Account Sign Out

Search

Application

Interests

Location:	San Francisco	Salary:	30000	Interested
Title: true	Software Engineer	Responsibilities:	MEAN stack Java Spring Hibernate Mongodb CI/CD	
Location:	Santa Clara	Salary:	50000	Interested
Title: true	Software Intern II	Responsibilities:	CI/CD Mean Stack	

### 5.2.3 Job Seeker can view and cancel his/her applications

Title: Engineer			
<input type="checkbox"/>	Company: Cloudzilla	Job Title: Test Intern	Status: Pending <a href="#">Cancel</a>
	Company: Big Company	Job Title: Intern	Status: Cancelled
	Company: Oracle	Job Title: Software Engineer	Status: OfferAccepted
	Company: Cloudzilla	Job Title: Software Intern I	Status: Cancelled
	Company: Oracle	Job Title: Software Engineer	Status: OfferRejected
	Company: Oracle	Job Title: Senior Consultant	Status: OfferRejected
	Company: Cloudzilla	Job Title: Software Engineer	Status: Cancelled

[Cancel Selected](#) [Reject Selected](#)

### 5.2.4 Job Seeker cannot apply more than 5 pending applications

Job Description

184.72.52.36:2000 says:  
A job seeker cannot have more than 5 pending applications.  
[OK](#)

[Account](#) [Sign Out](#)

**Job Description**  
Title: Software Engineer in Test  
Description: Tester with knowledge in Java, Selenium with 5yr experience required.  
Responsibilities: Testing the software developed  
Location: Santa Clara  
Salary: 90000

**Seeker Info**  
First Name: Neha  
Last Name: Kumar  
Email: nehasingh0021@gmail.com

**Application**  
Apply with Resume  
[Choose File](#) No file chosen  
[Submit](#)

### 5.2.5 Job Seeker cannot apply for the same position again if the previous one is not in the terminal state

Job Description

184.72.52.36:2000 says:  
Cannot apply for the same application again

Account Sign Out

OK

**Job Description**

Title: Marketing Intern

Description: Remote OK

Responsibilities: Microsoft Office Salesforce

Location: Remote

Salary: 20000

**Seeker Info**

First Name: Neha

Last Name: Kumar

Email: nehasingh0021@gmail.com

**Application**

Apply with Resume

Choose File No file chosen

Submit

### 5.2.6 Company can change job's state

Job Description

Sign Out

**Job Description**

Filter Cancel

Title: Senior Consultant

Status: Open

Responsibilities: 2-5 years of overall experience in relevant functional or technical

Location: Redwood City

Salary: 100000

Description: Intermediate consulting position operating independently with some assistance and guidance to provide quality work

Update Back

184.72.52.36:2000 says:  
The job status cannot be filled, because there is not any offerAccepted status application.

OK

**Job Description**

Filter Cancel

Title: Senior Consultant

Status: Open

Responsibilities: 2-5 years of overall experience in relevant functional or technical

Location: Redwood City

Salary: 100000


Description: Intermediate consulting position operating independently with some assistance and guidance to provide quality work

Update Back

## 5.2.7 Company can view the application's profile or download a resume

Job Description [Back](#) [Sign Out](#)

Application Detail

	First Name:	Neha	Last Name:	Kumar
	Self Introduction:	Passionate developer looking for exciting opportunities.		
	Work Experience:	5yrs		
	Education:	Master in Software		
	Skills:	Java, C++, MySQL		
	Resume File:	<a href="#">CV Teng Jir(7).pdf</a>		

[Accept](#) [Reject](#)

CV Teng Jir(7).pdf

## 6 Testing plan executed and results

Test Case for Job Seeker

No.	Description	Result
1	Step 1: Use a new email address to sign up as a job seeker. Expect Results: A email with verification code will receive. Step 2: Input the verification code to login. Expect Results: Successful login and redirect to the home page of job seeker	Pass
2	Step 1: Job Seeker can view and update its profile at any time. Expect Results: The information will change accordingly after being updated. Job Seeker cannot apply for a job before editing his/her profile.	Pass
3	Step 1: Job Seeker can search jobs based on the key words, company name, location or salary. Expect Results: The results of search are correct.	Pass
4	Step 1: Job Seeker can apply for a job and then apply for it again. Expect Results: The first application has been successfully submitted and an error for the second one to tell the seeker that he/she can only apply for the same position once. Job Seeker will receive an email verification when he/she successfully submitted the application.	Pass
5	Step 1: Job Seeker can mark/unmark any open positions in the job searching page. Expect Results: Job Seeker can only mark those open positions.	Pass

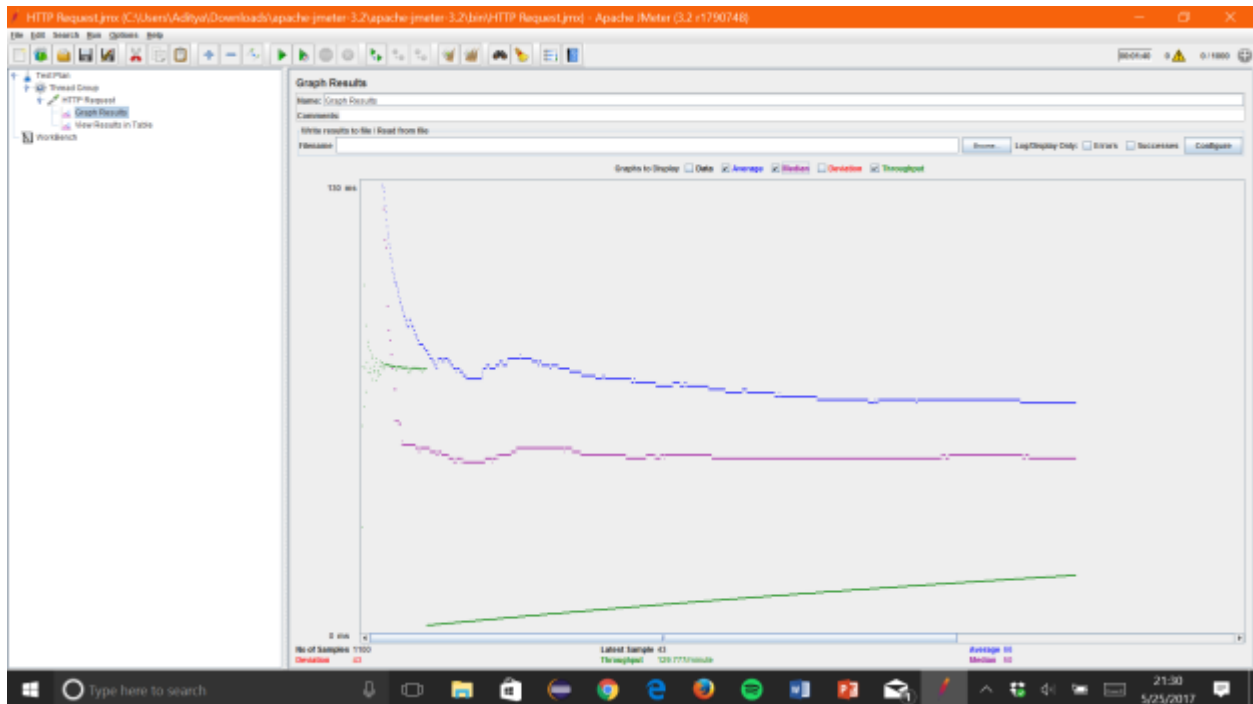
6	<p>Step 1: Job Seeker can view all his/her interesting jobs and unmark them in the interesting view</p> <p>Expect Results: After unmarking the interesting job, the job will be moved from the interesting list after that.</p>	Pass
7	<p>Step 1: Job Seeker can view all his/her applications in application view and can cancel an application which is in non-terminal state.</p> <p>Expect Results: The application is moved from the application list after the job seeker cancel it.</p>	Pass



### Test Case for Company

No.	Description	Result
1	<p>Step 1: Sign In as a company with wrong password. Expect Results: An error with wrong password will come.</p> <p>Step 2: Sign In as a company with correct password. Expect Results: It will redirect to company's homepage after successfully sign in.</p>	Pass
2	<p>Step 1: Company can view and update its profile at any time. Expect Results: The information will change accordingly after being updated.</p>	Pass
3	<p>Step 1: Company can post a job and edit it at any time. Expect Results: The job is searchable for the job seeker after being created.</p>	Pass
4	<p>Step 1: Company can change the job's state. Expect Results: An error will come when the company cancel a position which has no application in OfferAccepted state, otherwise the state will be updated successfully.</p>	Pass
5	<p>Step 1: Company can view application's profile and then give offer or reject the application. Expect Results: After give offer or reject, the Accept and Reject buttons will disappear</p>	Pass

## Load Test (Scalability Testing):



Above test was performed on a sign in function for 1000 users. Average Latency was 60 ms and the median was 50. Throughput was 129 users per minute.

## 7 Lessons learned and possible future work

In this project, we get familiar with some key concept in Spring framework, such as

- 1) Spring MVC, the model has no idea about the view part, the view only focuses on how to present data and the controller connects the model and view part.
- 2) JPA, a very useful technology to access data from database.
- 3) Transaction, four key properties of transaction is ACID which stands for Atomicity, Consistency, Isolation and Durability.
- 4) ORM, ManyToMany, ManyToOne, OneToMany and OneToOne relationships.

In the future, we will beautify our web pages and implement the 1) interview function which allows company and seeker to arrange an interview online and 2) post function which enables seeker and company to share a new technology or an upcoming job affair.