

# PROJECT REPORT

## SKILL / JOB RECOMMENDER APPLICATION

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# **Project Report**

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# SKILL / JOB RECOMMENDER APPLICATION

## 1. INTRODUCTION

### 1.1 PROJECT OVERVIEW

To develop an end-to-end web application capable of displaying the current job openings based on the user skillset. The user and their information are stored in the Database. An alert is sent when there is an opening based on the user skillset. Users will interact with the chatbot and can get the recommendations based on their skills. We can use a job search API to get the current job openings in the market which will fetch the data directly from the webpage.

### 1.2 PURPOSE

Having lots of skills but wondering which job will best suit you? Don't need to worry! We have come up with a skill recommender solution through which the fresher or the skilled person can log in and find the jobs by using the search option or they can directly interact with the chatbot and get their dream job.

## 2. LITERATURE SURVEY

### 2.1 EXISTING PROBLEM

Recent surveys on applications of recommender systems, job recommender systems and (more general) recommender systems in e-recruitment, are frequently not included. I.e., in the well-cited review on applications of recommender systems, Lu et al. [81] do not mention the application area of e-recruitment, the same holds for the earlier review by Fel fernig et al. [41]. Also, although most papers on neural networks in job recommender systems were published after 2018, the survey on (deep) neural networks in recommender systems (including a section on application areas) also neglects this application [11]. From the HR perspective, job search and recommendation are also not always mentioned as an application area, as opposed to candidate selection, while in the end these systems do determine who will be in the applicant pool in the first place

### 2.2 REFERENCES

- <https://www.linkedin.com/pulse/writing-literature-review-research-experts-group/>
- [https://www.researchgate.net/publication/356601605\\_Job\\_Recommender\\_Systems\\_A\\_Review](https://www.researchgate.net/publication/356601605_Job_Recommender_Systems_A_Review)

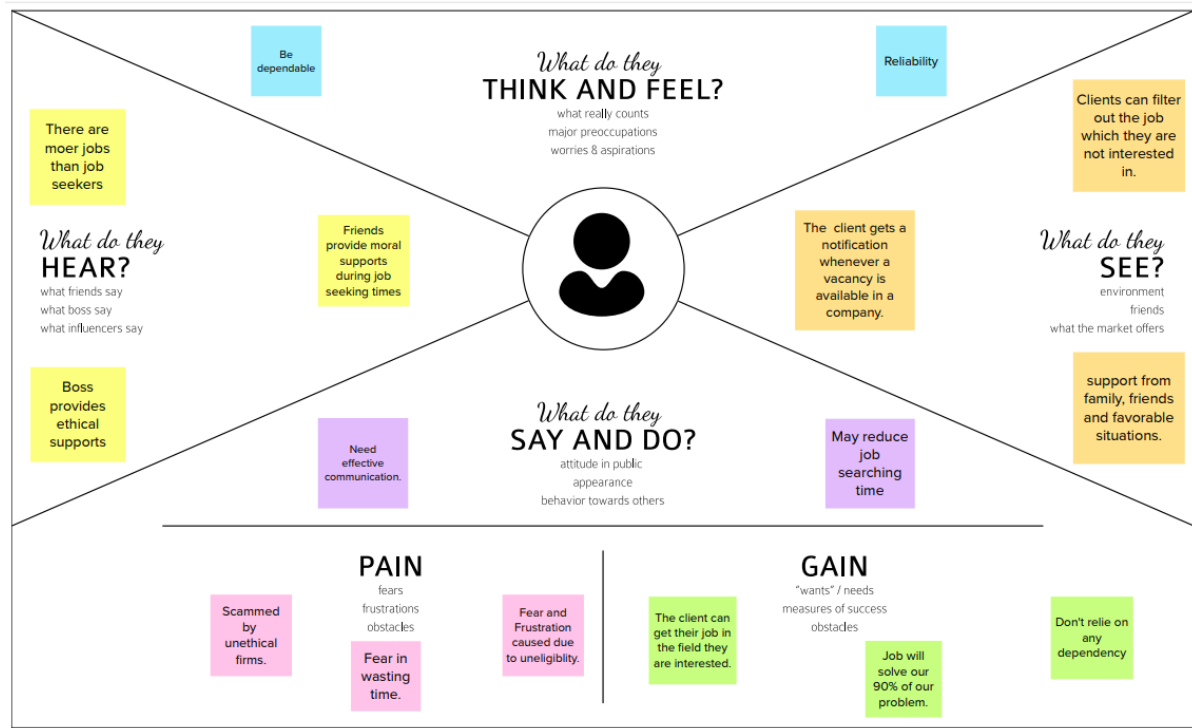
### 2.3 PROBLEM STATEMENT DEFINITION

1. The job seeker needs a way to efficiently search for a job that suits their skills and lies in their domain of interest by utilizing the accurate search and personalized recommendation of the proposed system.
2. The job recruiter needs a way to advertise the job vacancies in their organization. The system enables the recruiters to post job vacancies' details along with the skills and experience required for the job.
3. The job recruiters need a way to find the most eligible candidates for the offered role. The system helps the recruiter choose suitable candidates for the opening by resume parsing. Resume parsing allows the recruiter to select candidates whose skills match the required skills, making the recruiting process easier and quicker.
4. The application analyses the integrity of the candidate applying for the job and the organization which posts vacancies for the job.

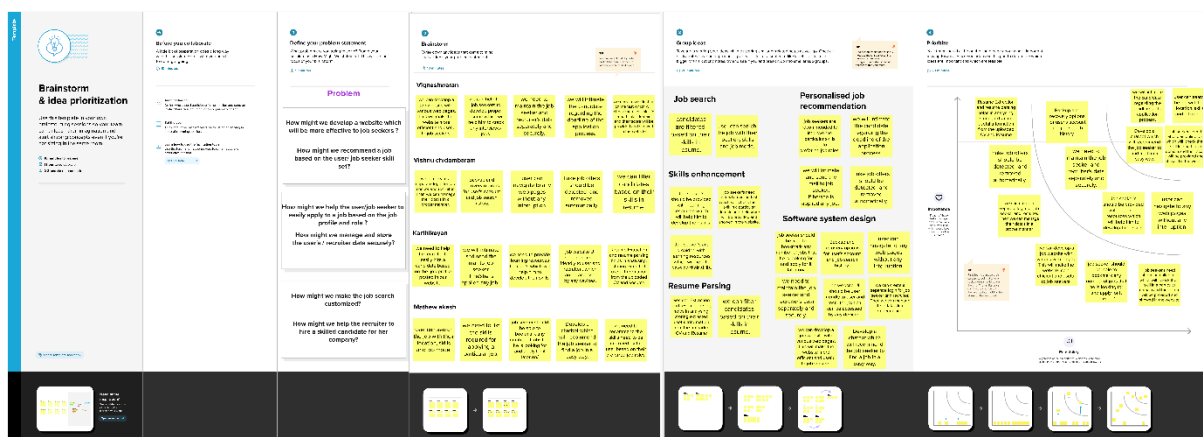
- The job seeker needs a way to find the required skills they lack for their job opening of interest to improve their chances of getting selected. The system recommends a list of skills based on previous resume data of successful candidates.

## 3. IDEATION & PROPOSED SOLUTION

### 3.1 EMPATHY MAP CANVAS



### 3.2 IDEATION & BRAINSTORMING



### 3.3 PROPOSED SOLUTION

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	<ul style="list-style-type: none"> <li>In order to Enhance the Opportunities and challenges to provide job.</li> <li>To Protect great volume of digital data</li> <li>To Satisfy the on the basis of the need and requirement of satisfaction.</li> </ul>

2.	Idea / Solution description	<ul style="list-style-type: none"> <li>To Reduce the Risk Assessment &amp; Threat Analysis in the platform.</li> <li>Creating Prototype Solution so that user can access Easily.</li> </ul>
3.	Novelty / Uniqueness	<ul style="list-style-type: none"> <li>On-demand Self Service which help the user to gain knowledge regarding on specified job</li> <li>Mobile end point security that allows Organization to protect all the devices on their network and prevent unauthorized access.</li> </ul>
4.	Social Impact / Customer Satisfaction	<ul style="list-style-type: none"> <li>Frequently updating about requirements and Full filling the needs.</li> <li>User will get a Responsive speed Regarding the job they have searched.</li> <li>User friendly Layout and approach design.</li> </ul>
5.	Business Model (Revenue Model)	<ul style="list-style-type: none"> <li>Commercializing about platforms in social media, entertainment application so that user will have knowledge about our platforms how effective it is.</li> <li>Generating Revenue through the advertisement that display on the platform.</li> </ul>
6.	Scalability of the Solution	<ul style="list-style-type: none"> <li>Hyper scaling capabilities that include the ability to provide and add more resources to the platforms.</li> <li>To improve job opportunities to fresher and unemployed person and also</li> </ul>

### 3.4 PROBLEM SOLUTION FIT

<b>1. CUSTOMER SEGMENT</b> Job seekers who are looking for right job Opportunity Recruiters Who are looking to hire a Valuable Candidates for their Company	<b>6. CUSTOMER CONSTRAINTS</b> <ul style="list-style-type: none"> <li>Network Facility</li> <li>Available Devices</li> <li>Premium Subscription</li> <li>Uninformative Company description</li> <li>Resume Access Limits</li> </ul>	<b>5. AVAILABLE SOLUTIONS</b> <ul style="list-style-type: none"> <li>Intelligent Job search</li> <li>Resume Parsing Functionality</li> <li>Finding Best match candidate</li> <li>Hiring Work flow</li> <li>Daily Job Alerts</li> </ul>
<b>2. JOBS-TO-BE-DONE / PROBLEMS</b> <ul style="list-style-type: none"> <li>Job seekers Facing difficulties in Finding a Suitable Jobs that fit for them</li> <li>Uninformative Job description</li> <li>Fake Job Offer</li> <li>Limited Professional Network</li> </ul>	<b>9. PROBLEM ROOT CAUSE</b> Existing solution has several issues: Privacy issue, Mismatch Job Recommendation based on user skill set Lengthy Application Process, Unstructured recruitment process, Fake Job offers.	<b>7. BEHAVIOUR</b> <ul style="list-style-type: none"> <li>When Candidate with inadequate Skill and Qualification apply for a position, employers get irritated.</li> <li>Users dissatisfy due to fake Job Offer.</li> </ul>

<b>3. TRIGGERS</b> Chat bot that helps in Job Recommendation Getting Job based on their Skill set	<b>10. YOUR SOLUTION</b> Daily Local and Remote Job Alerts, Displaying the current job openings based on the user skill set, An Alert is sent When there is opening based on, User Skill set, Job Recommendation from reputed Company, Live Streaming interviews <b>Chat bot:</b> User will interact with the chat bot and can get the recommendations based on their skills Using Chat bot Conversation with recruiters especially over the internet	<b>8. CHANNELS of BEHAVIOUR</b> <b>ONLINE:</b> <ul style="list-style-type: none"> <li>Matching Job based on the user Skill Set</li> <li>Apply for a job</li> <li>Upload your resume</li> <li>Review Job Application</li> </ul> <b>OFFLINE:</b> <ul style="list-style-type: none"> <li>Technical Interview, Final Interview</li> <li>Checkout Location and Infrastructure of the Company</li> </ul>
<b>4. EMOTIONS: BEFORE / AFTER</b> Before: Stressed Dissatisfaction. After: Connected to society Professional Network Reverence of Smartness		

## 4. REQUIREMENT ANALYSIS

### 4.1 FUNCTIONAL REQUIREMENT

Following are the functional requirements of the proposed solution,

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR- 1	User Registration	Registration through Form Registration through Gmail Confirmation via Email Confirmation via OTP

FR- 2	Chatbot	A chat on the webpage to solve user queries and issues
FR- 3	User Login	Login through Form Login through Gmail
FR- 4	User Profile	Updation of the user profile through the Login credentials
FR- 5	User Search	Exploration of Jobs that users search for using the filters

## 4.2 NON-FUNCTIONAL REQUIREMENT

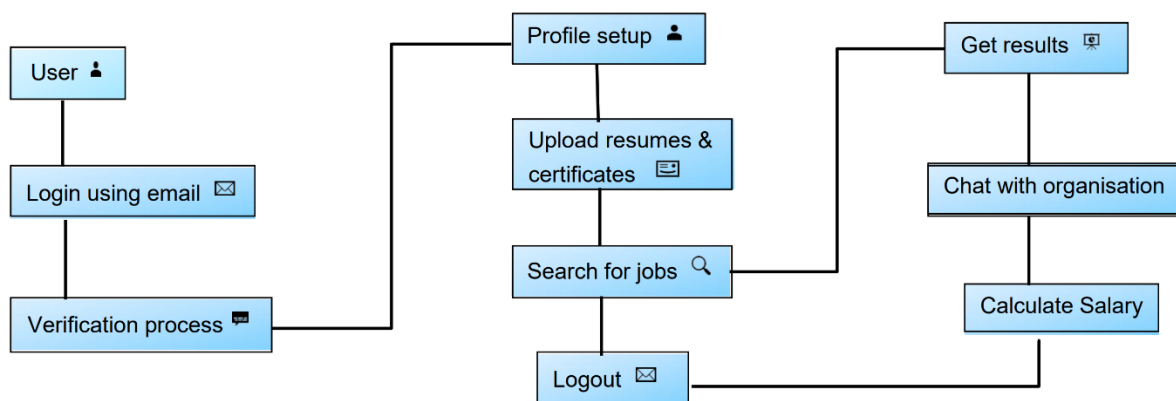
Following are the non-functional requirements of the proposed solution,

NFR No.	Non-Functional Requirement	Description
NFR- 1	Usability	This application can be used by the job seekers to login and search for the jobs
NFR- 2	Security	This application is secure with the personalised Login credentials
NFR- 3	Reliability	This application is trustworthy which provides good job offers and suggestions of skillset with real time notifications
NFR- 4	Performance	The performance of the application is quicker responses to search of job seeker
NFR- 5	Availability	This application provides job offers and skillset with user's preference
NFR- 6	Scalability	The response time of the application is quite faster with user choice

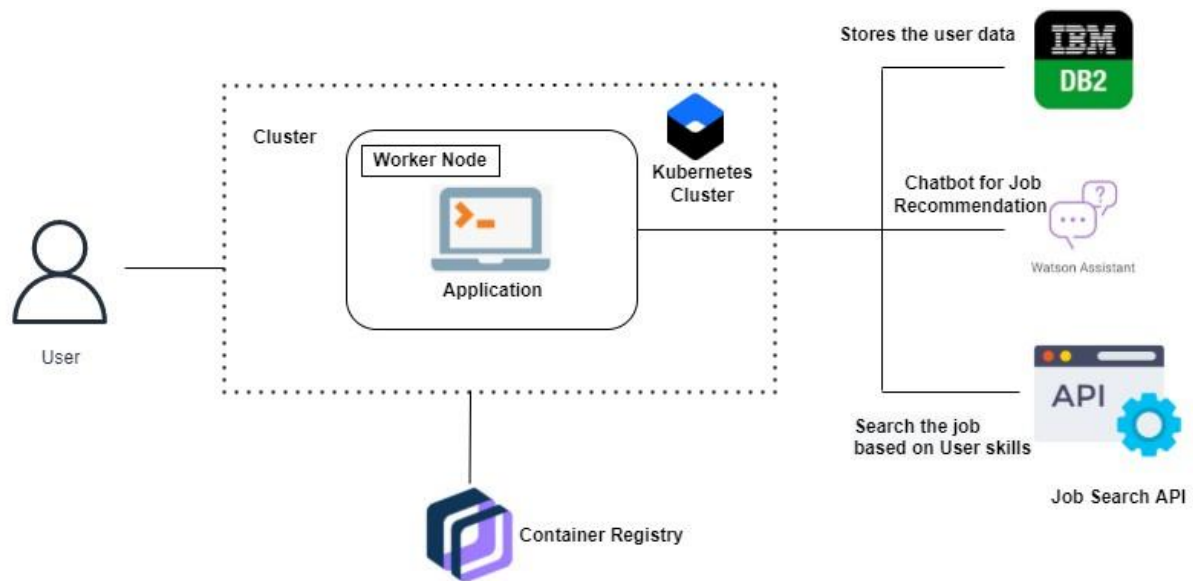
## 5. PROJECT DESIGN

### 5.1 DATA FLOW DIAGRAMS

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.



## 5.2 SOLUTION AND TECHNICAL ARCHITECTURE



## 5.3 USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	Sprint-1
		USN-3	As a user, I can register for the application through Facebook	I can register & access the dashboard with Facebook Login	Low	Sprint-2
		USN-4	As a user, I can register for the application through Gmail		Medium	Sprint-1
	Login	USN-5	As a user, I can log into the application by entering email & password		High	Sprint-1
	Dashboard	USN-5	As a user, I can access my dashboard after signing in.	I can access my account / dashboard	High	Sprint-1
Customer (Web user)	Access	USN-6	As a user, I can setup a profile, and basic details by signing in.			
		USN-7	As a user, I will upload my resume, certificates, and other requirements.	I can perform several task in the application	Medium	Sprint-1
Customer Care Executive	Chatbot	USN-8	As a user, I can seek guidance from the customer care executive.		High	Sprint-1
Administrator	DBMS	USN-9	As a administrator, I can keep the applications of your organization relies on running.	I can perform various modifications in the applications.	High	Sprint-1

## 6. PROJECT PLANNING & SCHEDULING

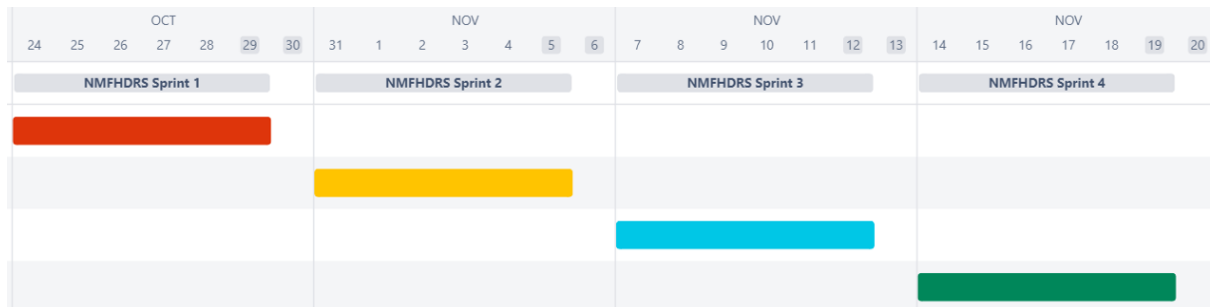
### 6.1 SPRINT PLANNING & ESTIMATION

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	5	High	Karthikeyan G, George Wilson G
Sprint-1		USN-2	As a user, I will receive confirmation email once I have registered for the application	5	High	Chathriya K, Dineshbabu K
Sprint-2		USN-3	As a user, I can register for the application through Facebook	3	Low	Gokul R, George Wilson G
Sprint-2		USN-4	As a user, I can register for the application through Gmail	5	Medium	Karthikeyan G, Dineshbabu K
Sprint-1	Login	USN-5	As a user, I can log into the application by entering email & password	5	High	Gokul R, Dineshbabu k
Sprint-2	Search	USN-6	As a user, I can search for the desired companies	7	High	Chathriya k, Karthikeyan g
Sprint-3	Apply	USN-7	As a user, I can apply for a company	6	High	George Wilson G, Chathriya k
Sprint-3	Review	USN-8	As a user, I can review the company	4	Medium	Gokul R
Sprint-4	Forward	USN-9	As an admin, I must forward the applications to the respective companies	4	High	Gokul R, Chathriya k, George Wilson G
Sprint-4	Send Confirmation	USN-10	Confirmation mail is sent from the respected company	4	High	Karthikeyan G, Dineshbabu K

### 6.2 SPRINT DELIVERY SCHEDULE

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

### 6.3 REPORTS FROM JIRA





## 7. CODING & SOLUTIONING

### 7.1 PYTHON CODE

```
1 from flask import Flask, request, render_template, redirect, url_for, session
2 import ibm_db
3 import re
4 import json
5 import requests
6 # from sendgrid import SendGridAPIClient
7 # from sendgrid.helpers.mail import Mail
8 import os
9
10 app = Flask(__name__, template_folder='template', static_folder='template/static')
11 app.config['SESSION_TYPE'] = 'memcached'
12 app.config['SECRET_KEY'] = 'super secret key'
13
14 session_username = ""
15
16 hostname = ''
17 uid = ''
18 pwd = ''
19 driver = "{}"
20 db = ''
21 port = ''
22 protocol = ''
23 cert = ''
24
25 dsn = {
26     "DATABASE = {0};"
27     "HOSTNAME = {1};"
28     "PORT = {2};"
29     "UID = {3};"
30     "SECURITY = SSL;"
31     "SSLServerCertificate = {4};"
32     "PWD = {5};"
33 }.format(db, hostname, port, uid, cert, pwd)
34
35
36 conn = ibm_db.connect(dsn, " ", " ")
37
38
39 @app.route("/")
40 def home_page():
41     return render_template('home.html')
42
43
44 @app.route("/login", methods=["GET", "POST"])
45 def login_page():
46     global userid
47     msg_value = ""
48     msg = ""
49     if request.method == 'POST':
50         username = request.form["username"]
51         password = request.form["password"]
52         # username = request.form.get("username")
53         # password = request.form.get("password")
54         print(username)
55         sql = "SELECT username,email,password from user where username = ? and password = ? "
56         stmt = ibm_db.prepare(conn,sql)
57         ibm_db.bind_param(stmt,1,username)
58         ibm_db.bind_param(stmt,2,password)
59         ibm_db.execute(stmt)
60         account = ibm_db.fetch_assoc(stmt)
61         print(account)
62         if account:
63             session['loggedin']=True
64             session['id'] = account['USERNAME']
65             userid = account['USERNAME']
66             session['USERNAME'] = account['USERNAME']
67             msg_value = "Logged in successfully"
68             global session_username
```

## 7.2 HTML AND CSS CODES

### HTML:

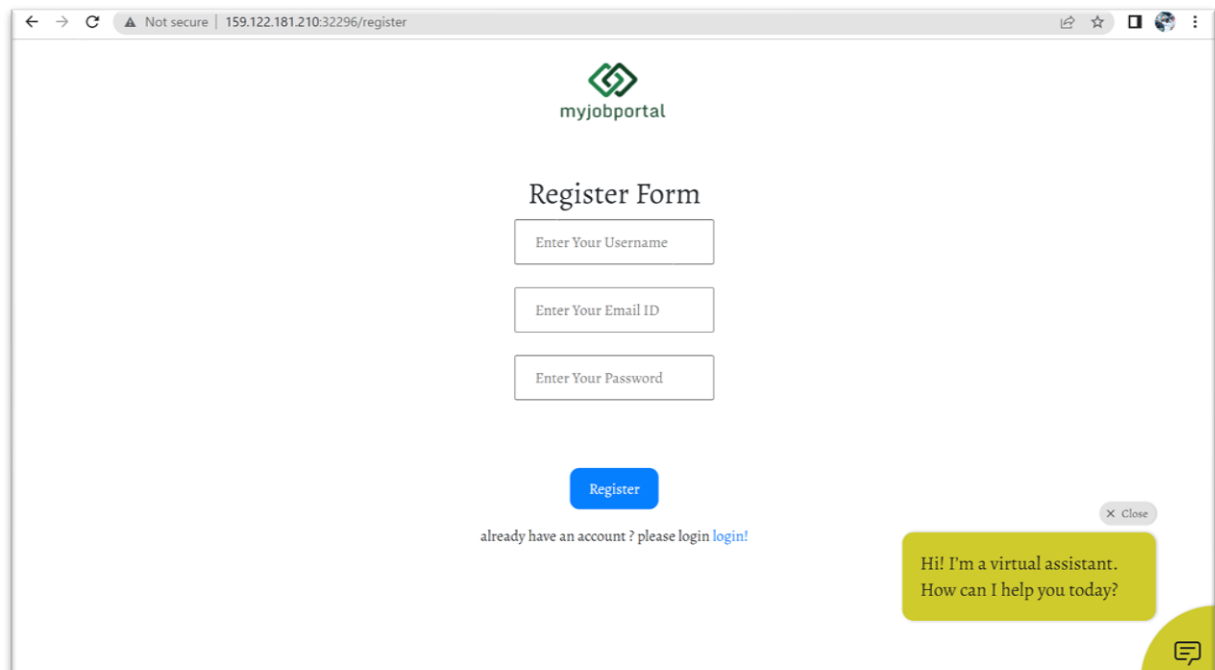
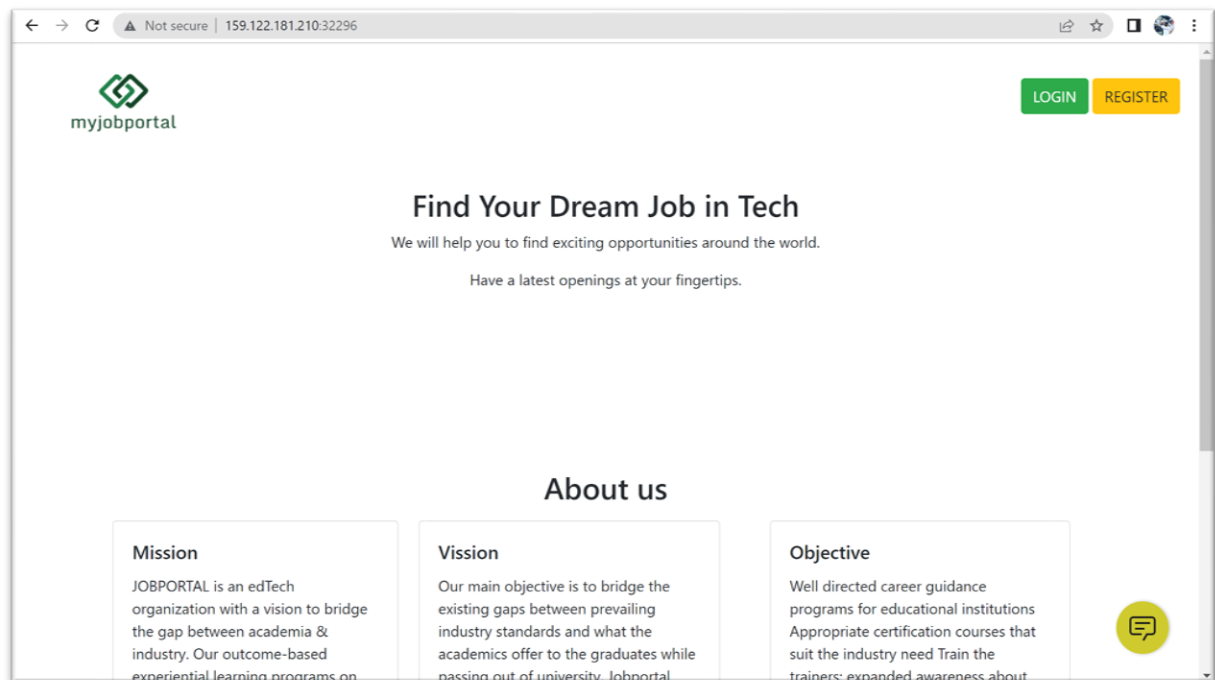
```
1  <!DOCTYPE html>
2  <html lang="en">
3  <head>
4    <style>
5      .space { margin-top: 150px; }
6      body {
7        background-color: #0BF9FC;
8      }
9    </style>
10   <meta charset="UTF-8">
11   <meta http-equiv="X-UA-Compatible" content="IE=edge">
12   <meta name="viewport" content="width=device-width, initial-scale=1.0">
13   <title>JOBPORTAL | HOME</title>
14   <meta charset="UTF-8">
15   <!-- favicon -->
16   <!-- <link rel="shortcut icon" href="/assets/img/favicon.ico" type="image/x-icon"> -->
17   <!-- <link rel="icon" href="/assets/img/favicon.ico" type="image/x-icon"> -->
18   <link rel="icon" type="image/png" sizes="16x16" href="/assets/img/favicon-32x32.png">
19   <!-- bootstrap css cdn -->
20   <link rel="stylesheet" href="https://stackpath.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.css" integrity="sha384-JcKb8q3iqJ61gN9Kb8tStNjpSL0n8PARn9HuZOnIxU0"
21   <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/4.7.0/css/font-awesome.css">
22   <!-- css stylesheet -->
23   <link rel="stylesheet" href="static/css/styles.css">
24   <!-- font styles cdn -->
25   <link rel="preconnect" href="https://fonts.gstatic.com">
26   <link href="https://fonts.googleapis.com/css2?family=Alegreya&display=swap" rel="stylesheet">
27   <link href="https://fonts.googleapis.com/css2?family=Alegreya:wght@600&display=swap" rel="stylesheet">
28 </head>
29 <body >
30   <!-- bootstrap navbar -->
31   <nav class="navbar sticky-top navbar-expand-lg navbar-dark">
32     <div class="container-fluid">
33       <a class="main-logo-img mt-3" href="#">
34       <!-- <a class="navbar-brand" href="index.html">JobPortal</a> -->
35     </a>
36
37     <div class="row donate-sponsor">
38       <a type="button" class="btn btn-success mr-1" id="donate" href="login">LOGIN</a>
39       <a type="button" class="btn btn-warning mr-1" id="sponsor" href="register">REGISTER</a>
40       <!-- <a type="button" class="btn btn-primary mr-1" id="sponsor" href="contact.html">CONTACT US</a> -->
41     </div>
42   </nav>
43   <!-- navbar ends -->
44
45   <!-- what we focus on -->
46   <section class="our-focus">
47     <div class="container">
48       <br>
49       <h2 class="text-center mt-3">Find Your Dream Job in Tech</h2>
50       <p class="text-justify text-center">
51         We will help you to find exciting opportunities around the world.
52       </p>
53       <p class="text-justify text-center">
54         Have a latest openings at your fingertips.
55       </p>
56     </div>
57   </section>
58   <br>
59   <div class="space"></div>
60   <div class="container">
61     <h2 class="text-center mt-3">About us</h2>
62     <div class="row ml-3 mt-3">
63       <div class="col-lg-3 mr-5" id="focus-first">
64         <div class="card" style="width: 19rem;">
65           <!-- 
66           <div class="card-body">
67             <h5 class="card-title">Mission</h5>
68             <p class="card-text">JOBPORTAL is an edTech organization with a vision to bridge the gap between academia & industry. Our outcome-based experiential learn
```

## CSS:

```
1 * {
2   font-family: 'Alegreya', serif !important;
3 }
4
5 /* // Small devices (landscape phones, 576px and up) */
6 @media (min-width: 576px) {
7
8 }
9
10 /* // Medium devices (tablets, 768px and up) */
11 @media (min-width: 768px) {
12
13 }
14
15 /* // Large devices (desktops, 992px and up) */
16 @media (min-width: 992px) {
17   .navbar {
18     padding-top: 15px;
19     padding-bottom: 15px;
20     background-color: white;
21   }
22   .navbar-brand {
23     padding-left: 5px;
24   }
25   .navbar-nav {
26     margin-left: 30px;
27   }
28   .nav-item {
29     padding-left: 5px;
30   }
31   .donate-sponsor {
32     margin-right: 10px;
33   }
34   #donate, #sponsor {
35     margin: 5px;
36     padding: 5px 15px 5px 15px;
37   }
38   .homepage-header {
39     background: url('../img/group.JPG');
40     background-size: cover;
41     background-position: center top;
42     padding: 0;
43     position: relative;
44     width: 100%;
45     overflow: hidden;
46     display: -webkit-flex;
47     display: -ms-flexbox;
48     display: flex;
49     height: 85vh;
50   }
51   .home-for-children {
52     background-color: #ffeeba;
53     margin-top: 0px;
54     padding-top: 10px;
55     padding-bottom: 30px;
56   }
57   .home-for-children h2 {
58     line-height: 2.5rem !important;
59     letter-spacing: 3px;
60     font-weight: 600;
61   }
62   .home-for-children h5 {
63     line-height: 1.8rem;
64   }
65   .home-for-children .btn-success {
66     padding: 8px 25px;
67     font-size: large;
68   }
```

## 8. RESULTS

### 8.1 PERFORMANCE METRICS



← → ↻ ⚠ Not secure | 159.122.181.210:32296/login

myjobportal

Login Form

Enter Your Username

Enter Your Password

Login

Don't have an account yet? Click here to [register!](#)

← → ↻ ⚠ Not secure | 159.122.181.210:32296/login

myjobportal

LOGOUT REGISTER MY JOBS


Skill Input

Enter Your Skill

search

Available Jobs

← → ↻ Not secure | 159.122.181.210:32296/dashboard



LOGOUT REGISTER MY JOBS

### Skill Input


Java

search

### Available Jobs

<b>Sr Full Stack Java Software Developer</b> http://www.leidos.com <div>Apply Now</div>	<b>Java Developer - Middleware Platform</b> http://www.insightglobal.com <div>Apply Now</div>	<b>Java Developer w/ Angular</b> None <div>Apply Now</div>
<b>Java with AWS</b> http://www.diverselynx.com	<b>Full Stack Java Software Developer</b>	<b>Lead Software Engineer (Java/J2EE)</b>

← → ↻ Not secure | 159.122.181.210:32296/login



JOBPORTAL | HOME  
159.122.181.210:32296

### Skill Input

Enter Your Skill

search

### Available Jobs

Jobless Tiger

Get Started

Select an option from below.

I am a new user I already have an account.

I already have an account.

Please wait a sec...

Enter your registered Email ID.

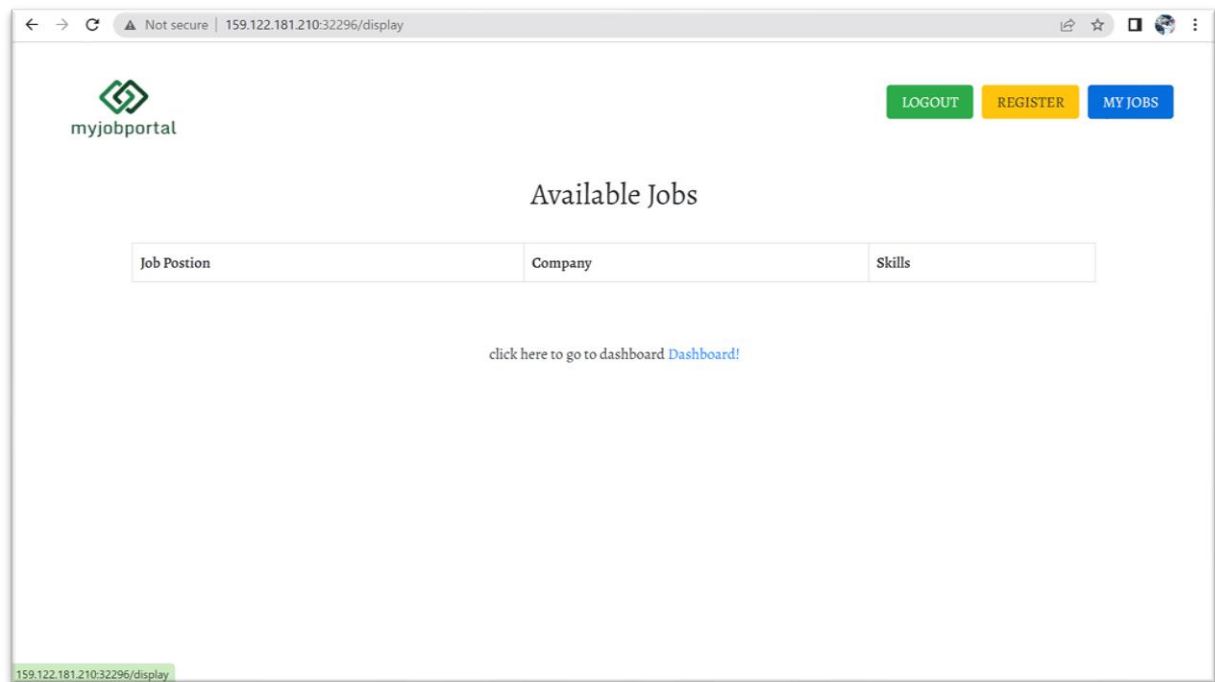
dineshvjo45@gmail.com

Is there a update in your work experience?

Yes No

type something...

Built with IBM Watson®



## 9. ADVANTAGES & DISADVANTAGES

### ADVANTAGES

- User can easily use this chat bot.
- The response time is very quick.
- It is available anytime.
- It acts as a job recommender guide for beginners.

### DISADVANTAGES

- The accuracy of this chat bot is not up to the mark.
- It requires more data from user for perfect recommendation.

## 10. CONCLUSION

This SKILL / JOB RECOMMENDER APPLICATION deals with recommending current job openings to the users based on their skills. The main purpose of this project is to get the current job openings from the market based on the skills entered by the user and the user can apply for that job profile.

## 11. FUTURE SCOPE

Job recommender systems have a great potential growth and will become increasingly sophisticated. The goal is to satisfy the user needs with the perfect job recommendation. The long terms prospects are hard as AI. AI-based job recommendation apps use various algorithms powered by artificial intelligence and machine learning to process real-time data to recommend the most perfect jobs to the user. Hence, online job seekers no longer need to spend millions of dollars on building or developing recommendation engines. The scope for job recommendations in online is vast, especially with the introduction of AI for perfect job recommendations.

## 13. APPENDIX

### SOURCE CODE

- <https://github.com/IBM-EPBL/IBM-Project-31938-1660206711/tree/main/Final%20Deliverables>

### GITHUB & PROJECT DEMO LINK

- <https://github.com/IBM-EPBL/IBM-Project-31938-1660206711>