SKILL JOB RECOMMENDER

NALAIYATHIRAN PROJECT REPORT

SUBMITTED BY

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JASHWANTH V	**(111619104165)**

TEAM ID : PNT2022TMID14513

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1 INTRODUCTION

1.1 Project Overview

This Project view provides an overview of the skill and job recommended for individuals interestedin a career in any fields. It discusses the important role that any field plays in businesses and the variousskills that are necessary for success in this field. It also outlines the different job opportunities available in any field and the different types of companies that employ any field professionals.

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 whichthe fresher or the skilled person can login and find the jobs by using search option or they can directly interact with the chatbot and get their dream job. To develop an end to end web application capable of displaying the current job openings based on the skillset of the users. The users and their information are stored in the Database. An alert is sent when there is an opening based on the user skillset. User will interact with the chatbot and can get the recommendations based on his skills. We can use jobsearch API to get the current job openings in the market which will fetch the data directly from the webpage.

2. LITERATURE SURVEY

2.1 Existing problem

1. Students/Job seekers find their desired job based on their skillset.
2. Integrating Intelligent CHATBOT for jobrecommendation application.
3. A study of LinkedIn as an Employment Tool for Job seeker & Recruiter.
4. Cloud storage and sharing services.

2.2 References

1. ” Priming Jobs as Skill Development Opportunities and Responses to Job Postings”

Drewery, David & Pretti, T. & Nettinga, Jamie. (2022). Priming Jobs as Skill Development Opportunities and Responses to Job Postings. Canadian Journal of Career Development. 21. 4-16. 10.53379/cjcd.2022.337.

Many inexperienced job seekers adopt a focused job search strategy in which they disregard job postings that seem unrelated to their interests. Yet, many of the jobs that they disregard during their job search could have been relevant to such interests because they offer opportunities for skill development. Counterintuitively, an exploratory job search can help such job seekers find and pursue more relevant jobs. In an experiment (N = 122), we examined the effect of priming seemingly irrelevant jobs as skill development opportunities on inexperienced job seekers' responses to job postings. Compared to those who did not receive the prime, those who received the prime reported higher perceived job relevance and, in turn, perceived job attractiveness for subsequently viewed job postings. The results suggest that career educators could use peer-to-peer learning, or public reflection, to encourage students to share insights with each other, reframe the meanings of job relevance, and pursue more relevant jobs.

2.”An Automated Recommendation Approach to Selection in Personnel Recruitment”

Färber, Frank & Weitzel, Tim & Keim, Tobias. (2003). An Automated Recommendation Approach to Selection in Personnel Recruitment.. 302.

Many online recruitment platforms suffer from the inappropriateness of Boolean search methods for matching candidates with job requirements. While such platforms have so far been a successful means for decreasing personnel advertising cost, the huge amount of electronic candidate profiles has not yet been exploited to optimize search quality. In this paper, using findings from an empirical survey on modern recruitment practices among Germany's top 1,000 enterprises and supported by findings from personnel selection theory, we identify a gap between the actual requirements of matching people with jobs and current e-recruitment procedures. Based on information systems research and drawing from selection and assessment theory, a framework for developing new matching methods is proposed. We describe the elements of a matching method using a probabilistic automated recommendation approach and then present first quite promising results from applying the algorithm to synthetic data.

3.” Job Recommendation based on Job Profile Clustering and Job Seeker Behavior”

Mhamdi, D. & Moulouki, R. & Ghoumari, M. & Azzouazi, M. & Moussaid, L.. (2020). Job Recommendation based on Job Profile Clustering and Job Seeker Behavior. Procedia Computer Science. 175. 695-699. 10.1016/j.procs.2020.07.102.

This article presents a recommender system that aims to help job seekers to find suitable jobs. First, job offers are collected from job search websites then they are prepared to extract

meaningful attributes such as job titles and technical skills. Job offers with common features are grouped into clusters. As job seeker like one job belonging to a cluster, he will probably find other jobs in that cluster that he will like as well. A list of top n recommendations is suggested after matching data from job clusters and job seeker behavior, which consists on user interactions such as applications, likes and rating.

4.” Job Recommendation System based on Text Analysis”

D. Mhamdi, R. Moulouki, M. Y. El Ghoumari, and M. Azzouazi. (2020) “Job Recommendation System based on Text Analysis.” Jour of Adv Research in Dynamical & Control Systems, Vol. 12, 04-Special Issue

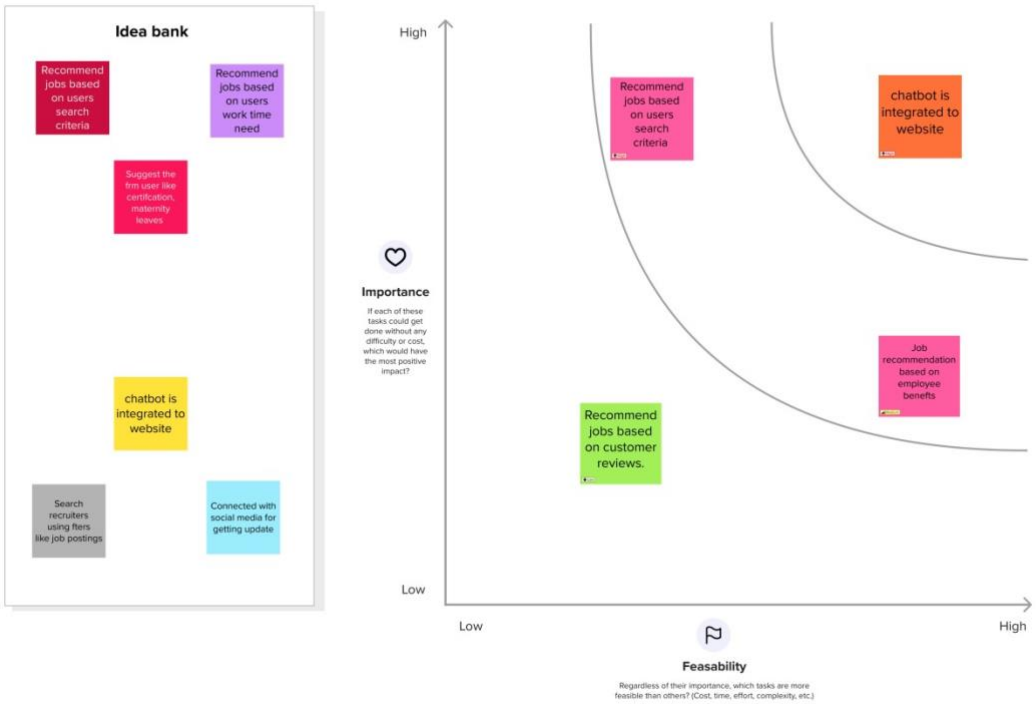
This article presents a job recommender system suggesting pertinent candidates for an offer posted by a recruiter. To accomplish this task, the data is collected from job recruiting websites then it is prepared through the extraction of appropriate attributes such as job titles, skills and experiences required for the targeted occupation. In a simple way, a job offer can be considered as a document mainly composed of two parts: a title and a job description. The title summarizes the role or position offered by the employer. The description usually provides the position details, including all the required relevant skills, according to the employer specifications. The proposed recommender system is based on the classification of job profiles. We first extract meaningful features from data by transforming noisy and unstructured textual data into structured formats, so it can be handled more clearly using text analysis algorithms based on topic modeling approach. The structured and cleaned data from job offers is matched with the data from resumes and a weighting of main attributes is set up before rendering the result as sorted recommendations.

2.3 Problem Statement Definition

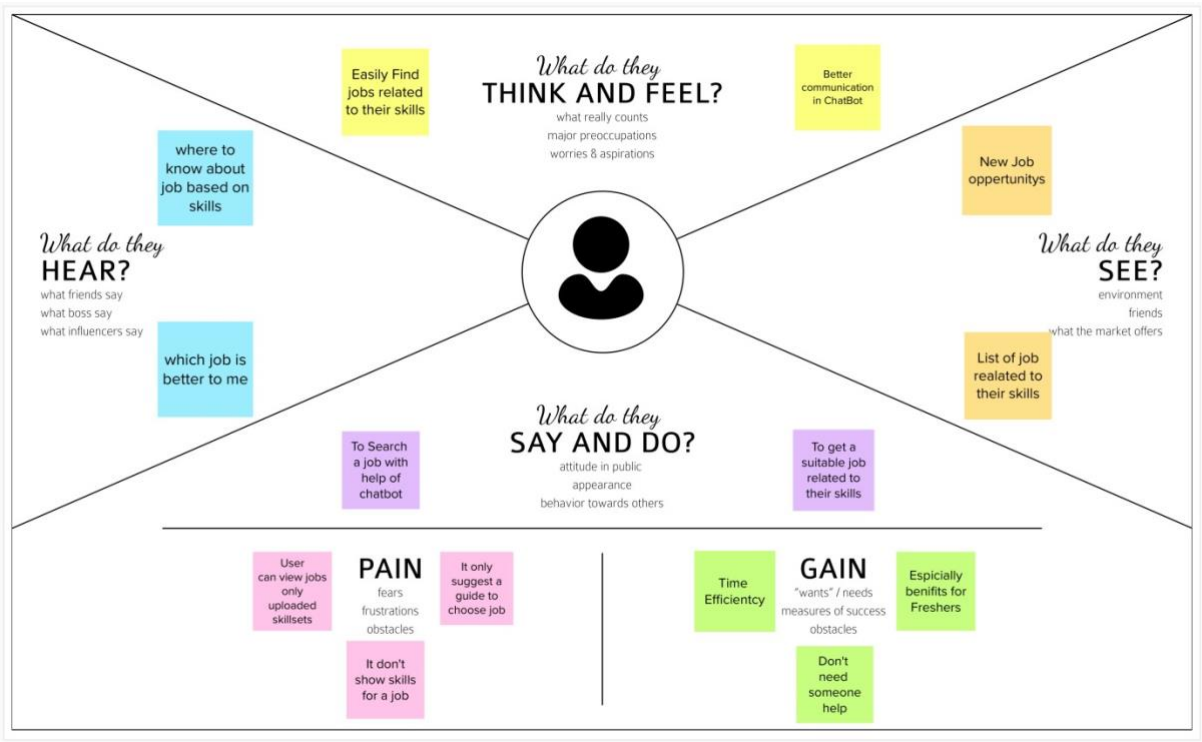
We have come up with new inovation solution through which you can directly choose your job related to your skills without need help from someone. You can search a job based on your skills and also chat with chatbot for get recommendation of list of jobs related to specified skillsets. We develop an end-to-end 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. User can login into application and search a job othewise intract with chatbot via entering skills to the bot, it suggest some job based on entered skills and also it update latest jobs everyday,

lists of jobs are uploaded into database and the chatbot also connected with database once user enter skills into chatbot it will search related job in database then it disply various jobs related to skills.

3 IDEATION & PROPOSED SOLUTION



3.1 Empathy Map Canvas

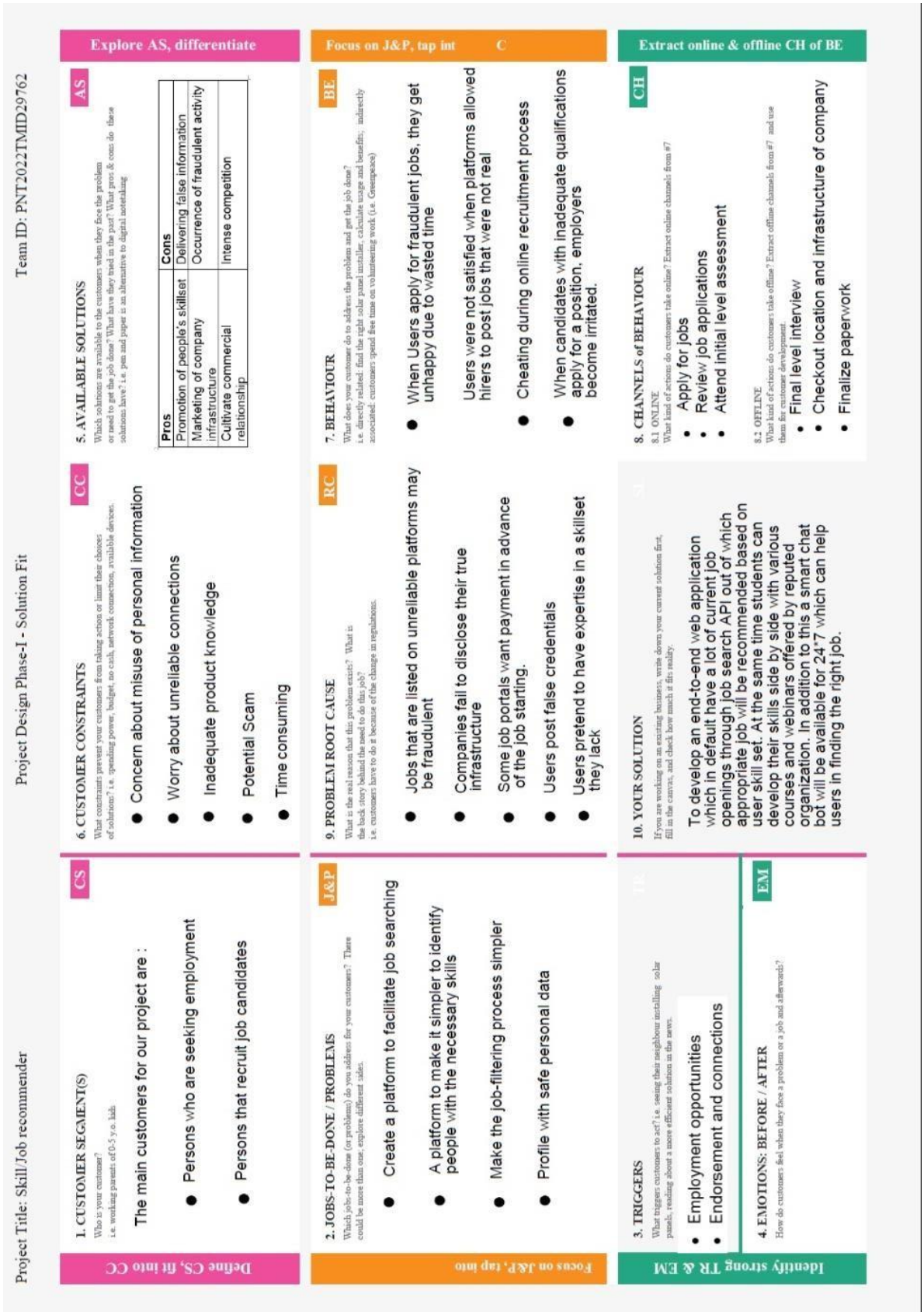


3.2 Proposed Solution

S. No	Parameter	Description
1.	Problem Statement (Problem to be solved)	Recommend the suitable job related to their skills
2.	Idea / Solution description	We have come up with new inovation solution through which you can directly choose your job related to your skills without need help from someone. You can search a job based on your skills and also chat with chatbot for get recommendation of list of jobs related to specified skillsets. We develop an endto-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. 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. User can login into application and search a job othewise intract with chatbot via entering skills to the bot, it suggest some job based on entered skills and also it update latest jobs everyday, lists of jobs are uploaded into database and the chatbot also connected with database once user enter skills into chatbot it will search related job in database then it disply various jobs related to skills.
3.	Novelty / Uniqueness	In this appication we provide extra link- feature for applying a job that recommened by application
4.	Social Impact / Customer Satisfaction	Job and skill recommended Application which is helpful for people who had lot of skills and choose an best field or job related to skills
5.	Business Model (Revenue Model)	Revenue can be generated by selling the whole kit.The revenue can also be obtained by ad service where they can inspect the system, for that service they can charge the customers.
6.	Scalability of the Solution	Whatever Skill may be given but skill/job application don’t fail to give recommendation

3.3 Problem Solution Fit



4 REQUIREMENT ANALYSIS

4.1 Functional requirement

Function Requirement: Software Required: Python, Flask, Docker

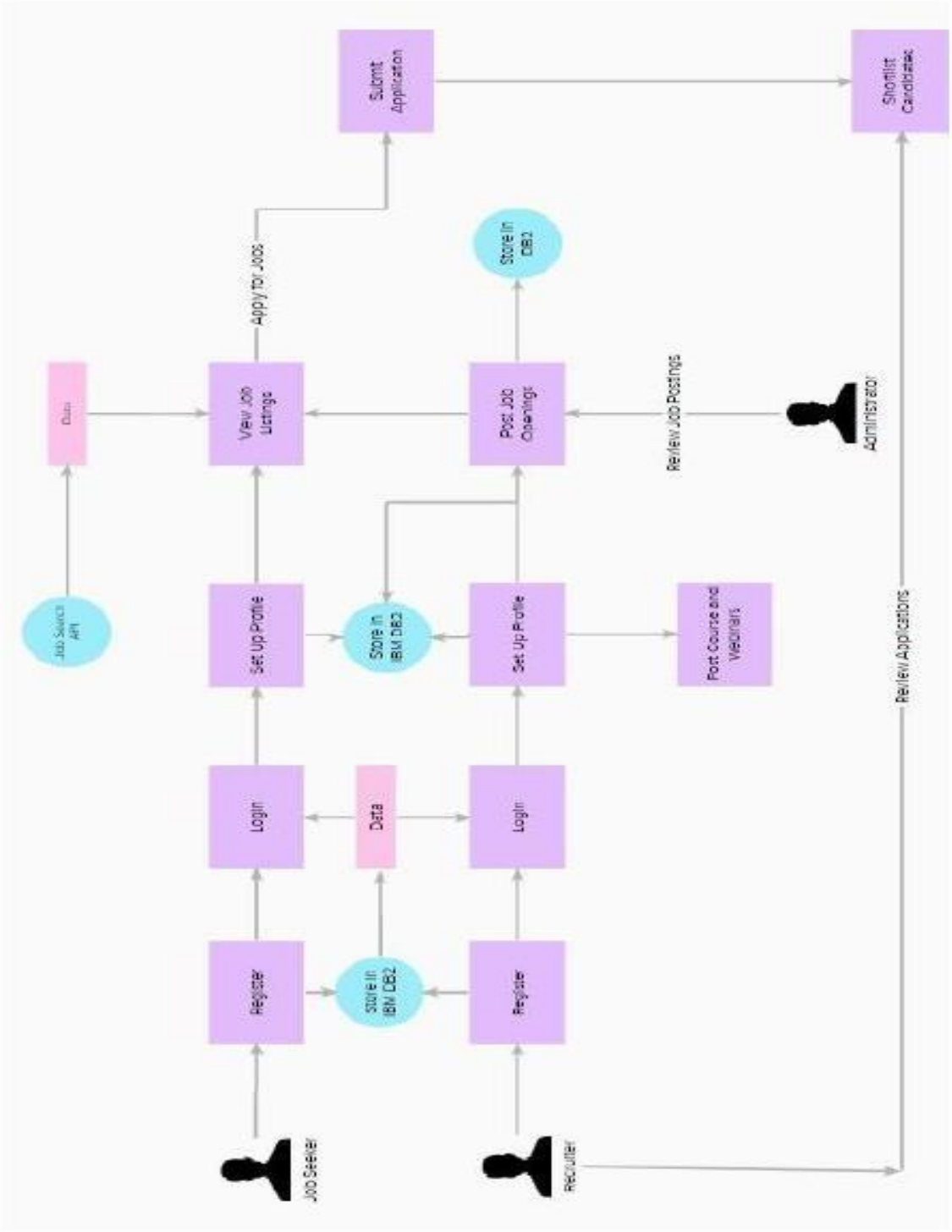
FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Sign in / Login	Register with username, password
FR-2	Profile Registration	Register with username, password, email, qualification, skills. This data will be stored in a database.
FR-3	Job profile display	Display job profiles based on availability, location, skills.
FR-4	Chatbot	A chat on the webpage to solve user queries and issues.
FR-5	Job Registration	The company's registration/Description details will be sent to the registered email id of the user.
FR-6	Logout	Use logout option after completing job registration process.

4.2 Non-Functional requirements

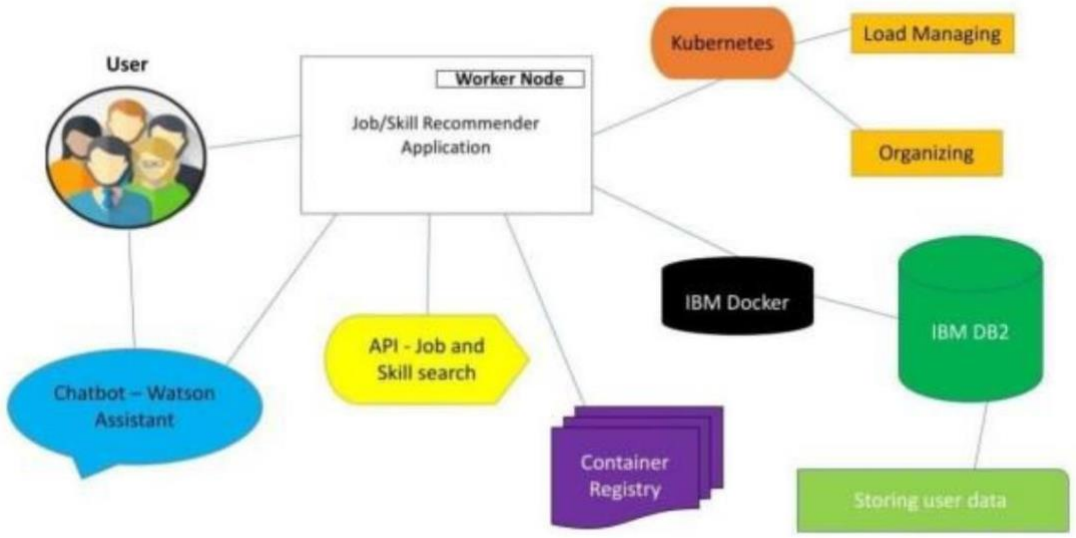
FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	The webpage will be designed in such a way that any non-technical user can easily navigate through itand complete the job registration work. (easy and simple design)
NFR-2	**Security**	Using of python flask to cloud connect will providesecurity to the project. Database will be safely stored in DB2.
NFR-3	**Reliability**	To make sure the webpage doesn't go down due to network traffic.
NFR-4	**Performance**	Focus on loading the webpage as quickly as possible irrespective of the number of user/integrator traffic.

5. PROJECT DESIGN

5.1 Data Flow Diagrams



5.2 Solution & Technical Architecture



5.3 User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Web User)	Registration	USN-1	As a user, I can register for the application by entering my username, email, password, confirming my password and specifying myself as Job seeker or Recruiter.	I can register & access my account / dashboard	High	Sprint-1
		USN-2	As a user, I will receive verification email once I have registered for the application	I can receive verification email & click verify	High	Sprint-1
		USN-3	As a user, I can register for the application through Google Signup	I can register & access my account / dashboard with Google Login	Low	Sprint-2
		USN-4	As a user, I can register for the application through Sign In with LinkedIn	I can register & access my account / dashboard with Google Login	Low	Sprint-1
	Login	USN-5	As a user, I can log into the application by entering registered email & correct password	I can access my account / dashboard	High	Sprint-1
		USN-6	As a user, I can log into the application using google sign in option	I can access my account / dashboard	Low	Sprint-2
		USN-7	As a user, I can log into the application using LinkedIn Login	I can access my account / dashboard	Low	Sprint-1
	Profile Setup	USN-8	As a fresh user I need to setup my profile by filling required details to easily apply to any jobs	I will be ready to apply for jobs	High	Sprint-2
		USN-9	As a fresh recruiter I need to setup profile for my company by filling required details so as to post jobs on the website	I will be ready to post job openings	High	Sprint-2
	Applying	USN-10	As a Job Seeker I can explore on various jobs listed f rom Google Job Search API as well as jobs directly posted by recruiters in the platform and apply with single click.	I can apply for any jobs listed in the Home Page	High	Sprint-3
	Posting	USN-11	As a Recruiter I can post various job openings	I can post jobs	High	Sprint-1
		USN-12	As a Recruiter I can post courses and webinars	I can post courses and webinars	Low	Sprint-4
	Shortlisting	USN-13	As a Recruiter I can Shortlist Candidates based on applications received.	I can choose efficient candidate	Medium	Sprint-4
	Chatbot	USN-14	As a User I can access chatbot to avail any kind of guidance in the website	I can avail chatbot help	High	Sprint-3
Administrator	Review Jobs	USN-15	As a administrator I can review posted jobs and publish them in the website	I review job Postings	Low	Sprint-4

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.	20	High	Bharathvaj Aashiq Anand Meyyzhaghan
Sprint-1	Verification	USN-2	As a user, I will receive confirmation email once I have registered for the application	20	High	Bharathvaj Aashiq Anand Meyyzhaghan
Sprint-2	Login	USN-3	As a user, I can log into the application by entering email & password	20	Low	Bharathvaj Aashiq Anand Meyyzhaghan
Sprint-2	Verification	USN-4	After click login button, It verify the login credatials wether entered details are correct or not.	20	Medium	Bharathvaj Aashiq Anand Meyyzhaghan
Sprint-3	Dashboard	USN-5	As a user, I can access my dashboard after signing in.	20	High	Bharathvaj Aashiq Anand Meyyzhaghan

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-3	Profile	USN-6	As a user, I can set up a profile, and basic details.	20	High	Bharathvaj Aashiq Anand Meyyzhaghan
Sprint-4	ChatBot	USN-7	As a user, I can access the chatbot for job recommendation	20	High	Bharathvaj Aashiq Anand Meyyzhaghan
Sprint-4	Salary	USN-8	As a user, I will be able to know the salary for my job	20	High	Bharathvaj Aashiq Anand Meyyzhaghan

Project Tracker, Velocity & Burndown Chart: (4 Marks)

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

Velocity:
Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

$$AV = \frac{sprint\ duration}{velocity} = \frac{20}{10} = 2$$

7. CODING & SOLUTIONING 7.1 Feature 1:

- IBM Cloud
- IBM Watson
- PlatformIBM DB2
- Container Registry

- Kubernetes Cluster

7.2 Feature 2:

- Login
- Update Resume
- Job Recommendations

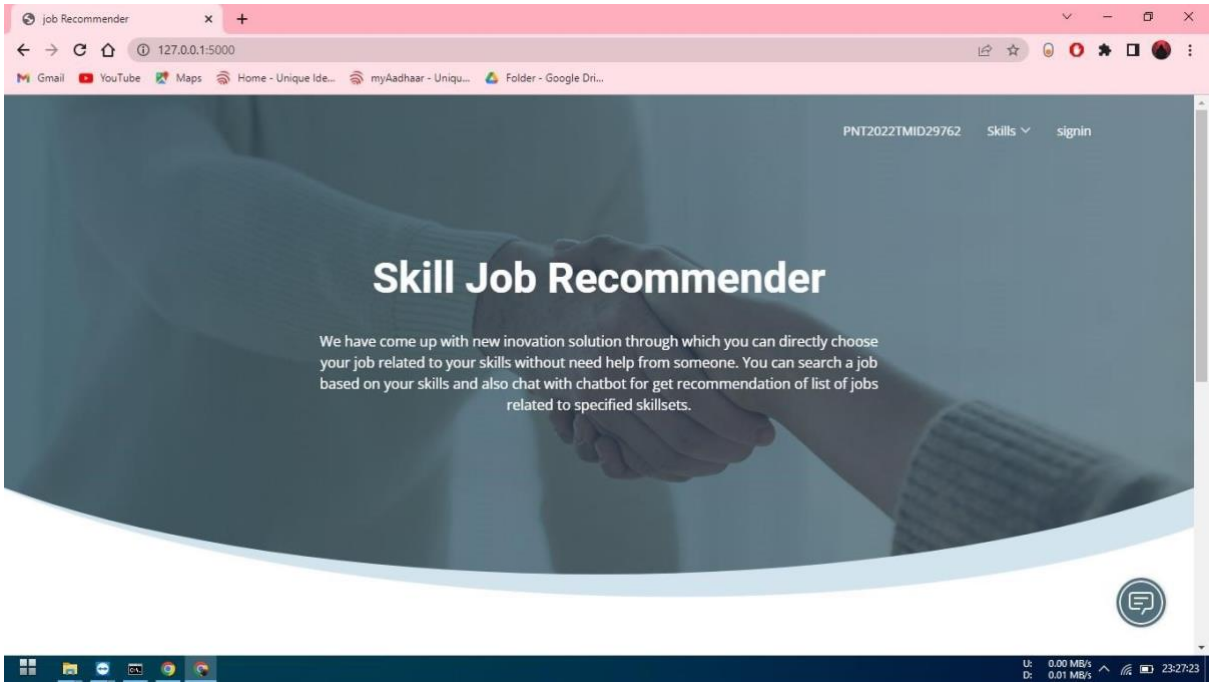
App.py

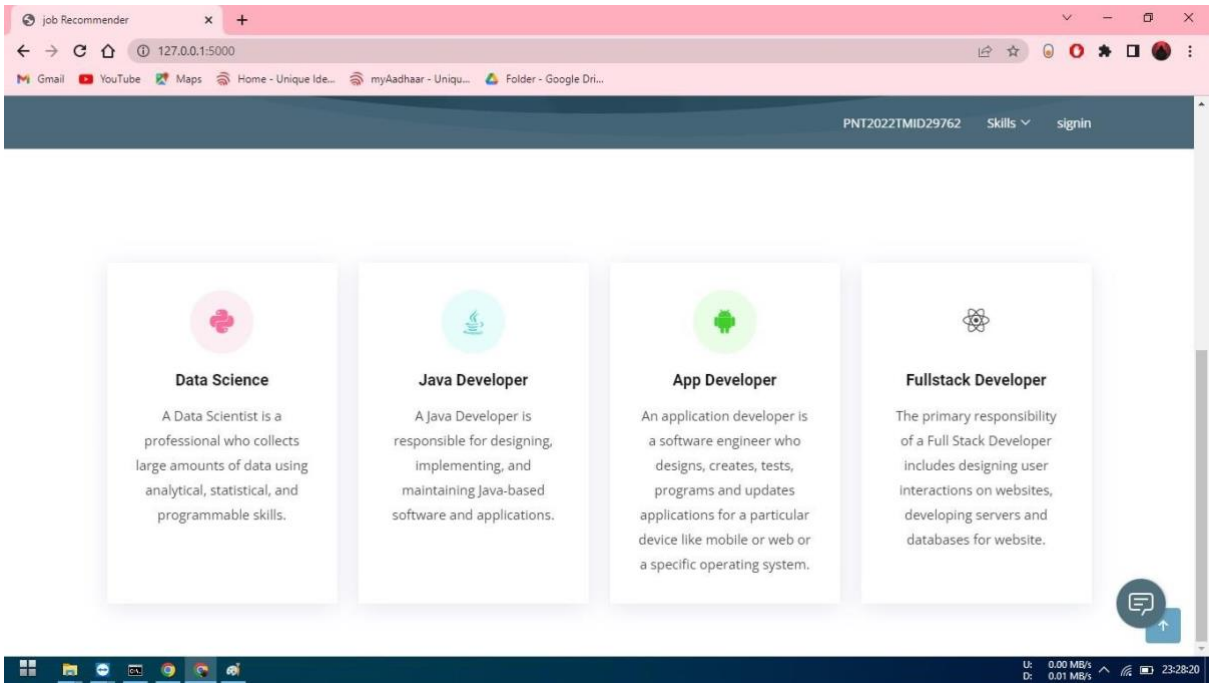
```
from turtle import st

from flask import Flask, render_template, request, redirect, url_for, session from

markupsafe import escape


import ibm_db

conn = ibm_db.connect("DATABASE=bludb;HOSTNAME=3883e7e4-18f5-4afe-
be8cfa31c41761d2.bs2io90l08kqb1od8lcg.databases.appdomain.cloud;PORT=31498;SECURITY=SSL;S
SLServerCertificate=DigiCertGlobalRootCA.crt;UID=nvc66176;PWD=mJ8bip8lv31naRX3","")



app = Flask(__name__)


@app.route('/') def

index():

   return render_template('index.html')



@app.route('/reco') def

recomender():

   return render_template('recomender.html')
```

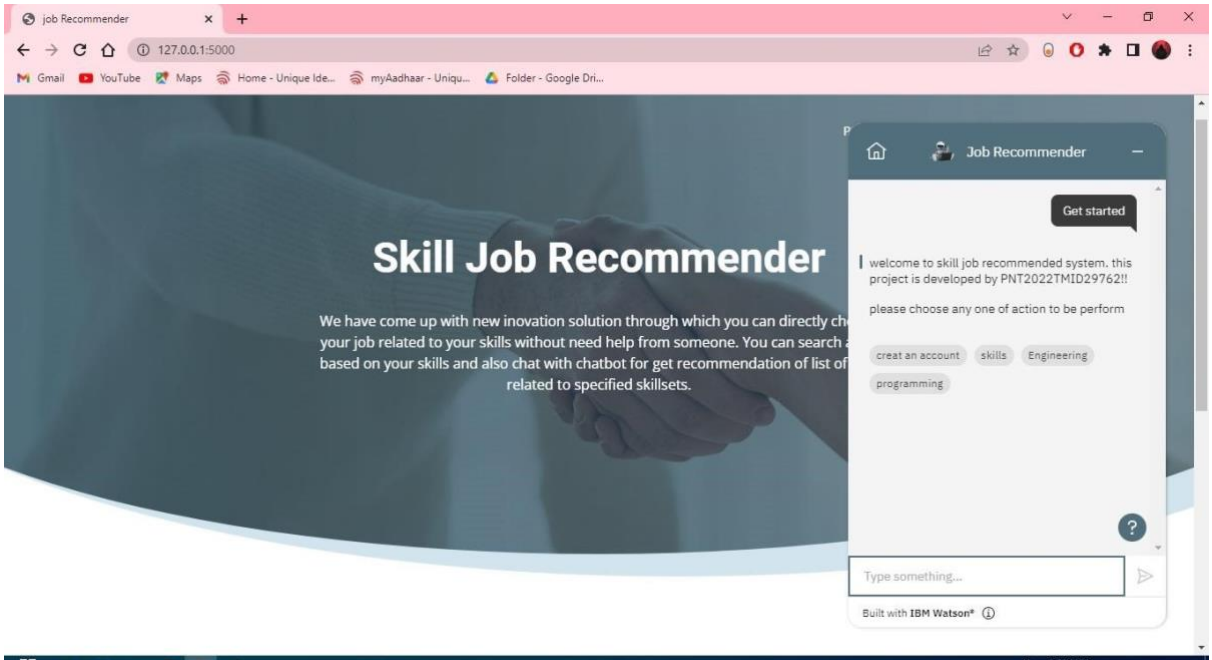
```
@app.route('/login') def
login():
    return render_template('signin.html')

@app.route('/signup') def
signup():
    return render_template('signup.html')




@app.route('/addrec',methods = ['POST', 'GET'])
def addrec():   if request.method == 'POST':

    name = request.form['name']
mail = request.form['email']
password = request.form['pass']
password2 = request.form['pass2']
sql = "SELECT * FROM login
WHERE name =?"     stmt =
ibm_db.prepare(conn, sql)
ibm_db.bind_param(stmt,1,name)
ibm_db.execute(stmt)
    account = ibm_db.fetch_assoc(stmt)

    if account:
      return render_template('list.html', msg="You are already a member, please login using your details")
else:
     insert_sql = "INSERT INTO login VALUES (?,?,?,?)"
prep_stmt = ibm_db.prepare(conn, insert_sql)
ibm_db.bind_param(prep_stmt, 1, name)
ibm_db.bind_param(prep_stmt, 2, mail)
ibm_db.bind_param(prep_stmt, 3, password)
ibm_db.bind_param(prep_stmt, 4, password2)
ibm_db.execute(prep_stmt)
```

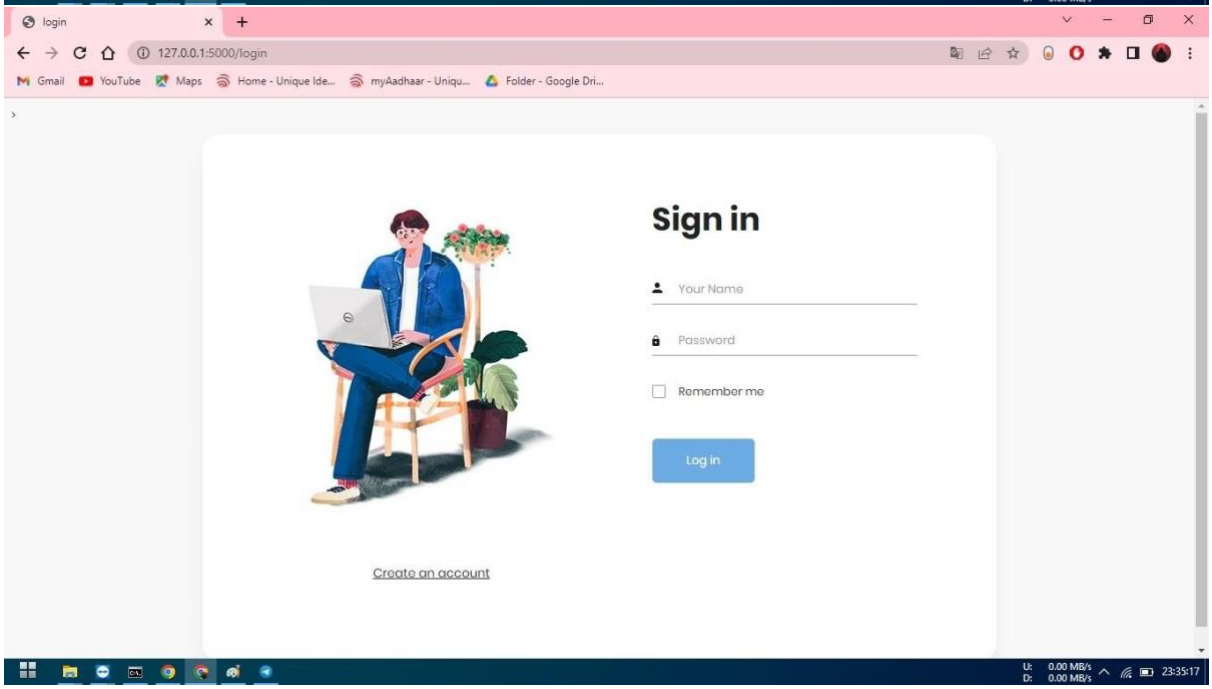
```
    return render_template('result.html', msg="Register successfuly..")


@app.route('/auth',methods=['GET','POST']) def
auth():

    if request.method=='POST':
        email=request.form['your_name']


        password=request.form['your_pass']
        sql="SELECT * FROM login WHERE mail=? AND password=?"
stmt=ibm_db.prepare(conn,sql)         ibm_db.bind_param(stmt,1,email)
ibm_db.bind_param(stmt,2,password)         ibm_db.execute(stmt)
        account=ibm_db.fetch_assoc(stmt)
print(account)         if account:
            return redirect(url_for('recomender'))
else:
            return render_template('result.html', msg="incorrect username or password")
elif request.method=='GET':
        return render_template('signin.html')


if __name__ == "__main__":
db.create_all()     app.run(debug=True)
```

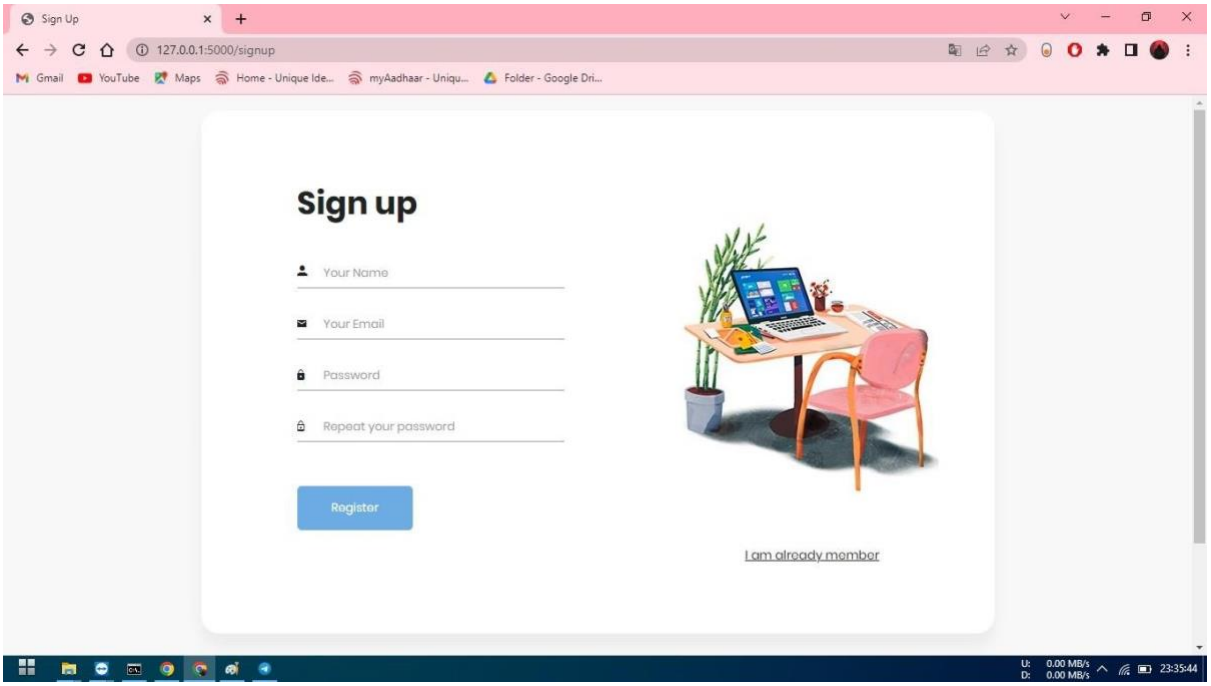
8. TESTING AND RESULTS:

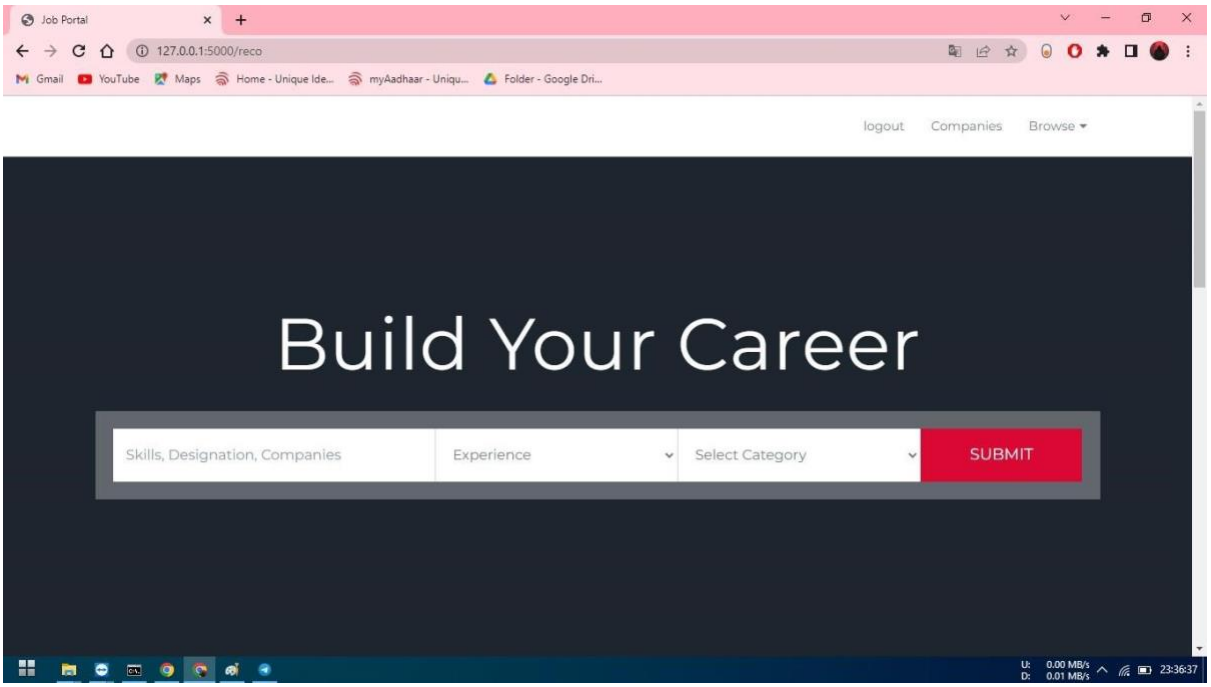

job Recommender
127.0.0.1:5000
Gmail
YouTube
Maps
Home - Unique Ide...
myAadhaar - Uniqu...
Folder - Google Dri...
PNT2022TMID29762
Skills
signin
Skill Job Recommender
We have come up with new inovation solution through which you can directly choose your job related to your skills without need help from someone. You can search a job based on your skills and also chat with chatbot for get recommendation of list of jobs related to specified skillsets.

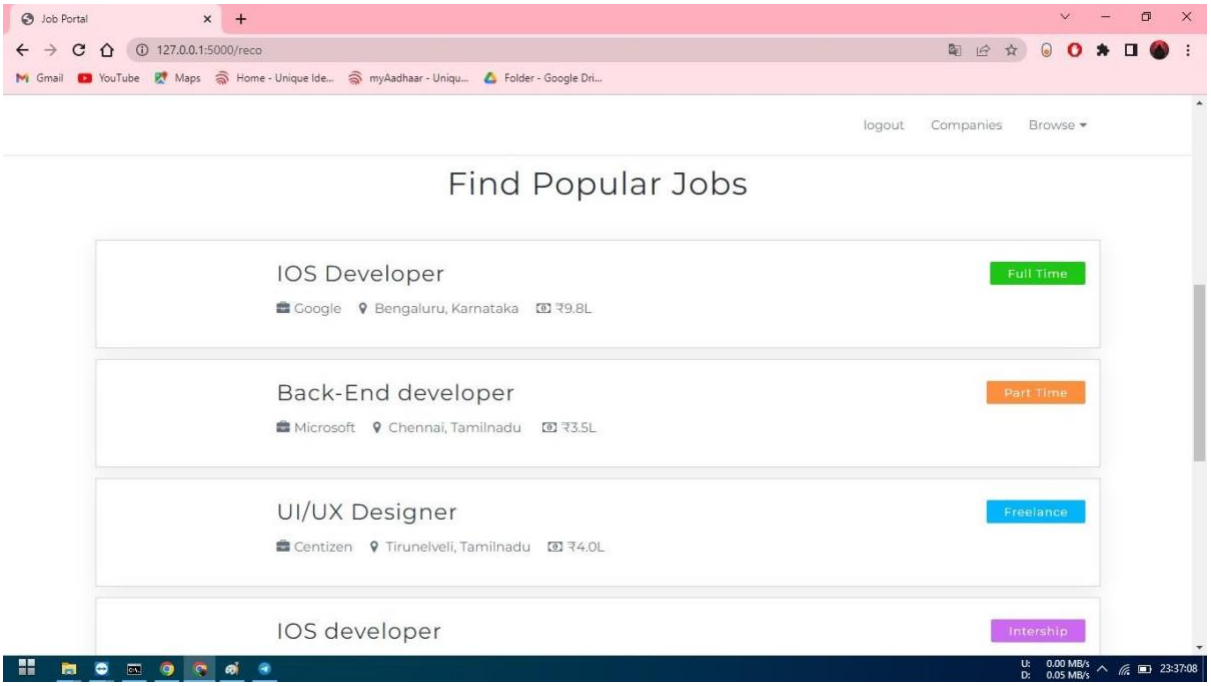

job Recommender
127.0.0.1:5000
Gmail
YouTube
Maps
Home - Unique Ide...
myAadhaar - Uniqu...
Folder - Google Dri...
PNT2022TMID29762
Skills
signin
Data Science
A Data Scientist is a professional who collects large amounts of data using analytical, statistical, and programmable skills.
Java Developer
A Java Developer is responsible for designing, implementing, and maintaining Java-based software and applications.
App Developer
An application developer is a software engineer who designs, creates, tests, programs and updates applications for a particular device like mobile or web or a specific operating system.
Fullstack Developer
The primary responsibility of a Full Stack Developer includes designing user interactions on websites, developing servers and databases for website.


job Recommender
127.0.0.1:5000
Gmail
YouTube
Maps
Home - Unique Ide...
myAadhaar - Uniqu...
Folder - Google Dri...
Skill Job Recommender
We have come up with new inovation solution through which you can directly ch
your job related to your skills without need help from someone. You can search
based on your skills and also chat with chatbot for get recommendation of list of
related to specified skillsets.
Job Recommender
Get started
welcome to skill job recommended system. this project is developed by PNT2022TMID29762!!
please choose any one of action to be perform
creat an account
skills
Engineering
programming
Type something...
Built with IBM Watson*


login
127.0.0.1:5000/login
Gmail
YouTube
Maps
Home - Unique Ide...
myAadhaar - Uniqu...
Folder - Google Dri...
Sign in
Your Name
Password
Remember me
Log in
Create an account


Sign Up
127.0.0.1:5000/signup
Gmail
YouTube
Maps
Home - Unique Ide...
myAadhaar - Uniqu...
Folder - Google Dri...
Sign up
Your Name
Your Email
Password
Repeat your password
Register
I am already member


Job Portal
127.0.0.1:5000/reco
Gmail
YouTube
Maps
Home - Unique Ide...
myAadhaar - Uniqu...
Folder - Google Dri...
logout
Companies
Browse
Build Your Career
Skills, Designation, Companies
Experience
Select Category
SUBMIT



9. RESULTS: ▪

- The project has been completed as we expected.
- We ensured that Database was designed and well connected to our project.
- The Expected results were gotten.

10. ADVANTAGES & DISADVANTAGES:

Advantages:

- Person who looks for a job can easily find a suitable job based on their skill set.
- Person can check their eligibility by attending eligibility test.
- Most of the Recruiters find the suitable person based on the scores they have gotten in the eligibility.

Disadvantages:

- Person Job May get technical difficulty while taking the eligibility Job seeker may have trouble to contact recruiters directly

11. CONCLUSION:

- The application has been developed to make job searcheasier.

- The application that we have developed is user friendly.
- User can find a job based on their skillset in the short periodof time. The jobseeker certainly get benefit by using this application.
- In the addition, Chatbot Has been implemented with the helpof IBM whatson. The chatbot helps jobseeker and organization when they experience the difficulties.

FUTURE SCOPE:

- The linked in the well known application to find a joband stay connected with professional and organization.
- The job seekers and organization use linked in to find a job.
- In the future, there are lots of possibilities to enhance our project similar to linked in.

GITHUB LINK

https://github.com/IBM-EPBL/IBM-Project-36405-1660294902