

PROJECT REPORT

SKILL AND JOB RECOMMENDER APPLICATION

CLOUD APPLICATION

Nalaiya thiran IBM project - 2022 Team Id : PNT2022MID29798



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Project Report **“SKILL AND JOB RECOMMENDER APPLICATION”** is the bonafide work of **KAMALESH.B (610519104048), DHARUN.T (610519104016), PRAVEEN KUMAR.K.C (610519104302), BOSHA PRANESH. M (610519104010)** who carried out the project work under my supervision during the academic year 2022-23.

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1 . INTRODUCTION

1.1 PROJECT OVERVIEW:

From the start of the commercialization of the internet in the late 1980s, the question was raised of how this technology could be leveraged in employee recruitment to enhance job seeker -vacancy matching. Even before the start of the world wide web, Vega already proposed a system to match job seekers and jobs , which could “be consulted by Minitel, using telephone number 3615 and selecting the LM/EMPLOI service” .I .e., the service allowed job seekers to send text messages in the form of search queries or their digital resume ,over the telephone line, using a computer terminal called Minitel1. The service would compare words in the query/resume to a knowledge base, which used a fixed job taxonomy to return a set of potentially interesting vacancies for the job seeker .Although more than 30 years have passed since this early contribution, the usage of a fixed job taxonomy to extract information from a resume including “branch of industry” (industry) and “qualification” (skill)using “(a) dictionary specialized in the universe of employment”, seems vaguely similar to LinkedIn’s query In the last years, job recommender systems have become popular since they successfully reduce information overload by generating personalized job suggestions.

Based on the person-job fit premise, we propose a framework for job recommendation based on professional skills of job seekers. We automatically extracted the skills from the job seeker profiles using a variety of text processing techniques. Therefore, we perform the job recommendation using TF-IDF and four different configurations of Word2vec over a dataset of job seeker profiles and job vacancies collected by us. Our experimental results show the performances of the evaluated methods and configurations and can be used as a guide to choose the most suitable method and configuration for job recommendation .

1.2 PURPOSE:

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. The significance of Information System (IS) support in the recruitment process can be observed when considering the phases of the recruitment such as the handling of candidates' applications and the pre-selection of candidates. However, a best fit between job and candidates depends on underlying aspects that are hard to measure. These underlying aspects are a significant reason why information systems have not been extensively used in the area of personnel selection so far. Mostly, IS technology is used to pre-select applicants based on Boolean search method. This method used queries contain a combination of key words that define skill requirements in order to determine those candidates that match with search criteria. Such type of skill matching is applied in numerous e-recruiting applications. However, as mentioned above, the simple filter techniques such as Boolean search method cannot be sufficient to realize the complexity of a person-job fit as selection decisions often depend on underlying attributes such as personal characteristics or social skills that cannot be put into an operational way easily (Malinowski et al., 2006). Additionally, the need to understand the job requirements, in terms of the skills that are mandatory and those that are optional but preferable, the experience criteria if any, preference for the location of the candidate etc. Consequently, the major challenge faced e-recruiting applications as identified by the literature analysis is the large number of low qualification of applicants that match the search criteria. Therecommender systems techniques can be used to address the problem of information overload by prioritize the delivery of information for individual users based on their learned preferences.

2 . LITERATURE SURVEY

2.1 EXISTING PROBLEM:

Problem-solving skills help you determine the source of a problem and find an effective solution. Although problem-solving is often identified as its own separate skill, there are other related skills that contribute to this ability.

Problem-solving skills are important in every career at every level. As a result, effective problem solving may also require industry or job-specific technical skills. For example, a registered nurse will need active listening and communication skills when interacting with patients but will also need effective technical knowledge related to diseases and medications. In many cases, a nurse will need to know when to consult a doctor regarding a patient's medical needs as part of the solution

According to some data, as unemployment rose, employers were looking for candidates with more skills, education, and experience. As the rate of unemployment started to fall, so did the expectations of employers. However, there are many other angles to this issue. As we'll explore, in the UK at least, there are clear signs that there are industries with shortages of qualified professionals. What's more, some data suggests that although levels of education are higher, basic skills like numeracy and literacy may be lagging behind.

2.2 REFERENCES:

References may provide correspondence that serves as a proof of service, length of employment, achievements, and qualifications. When choosing the ideal professional references to attest to your qualifications, go for persons who previously observed you while in a productive capacity either at work, lecture rooms, or in a volunteer setting.

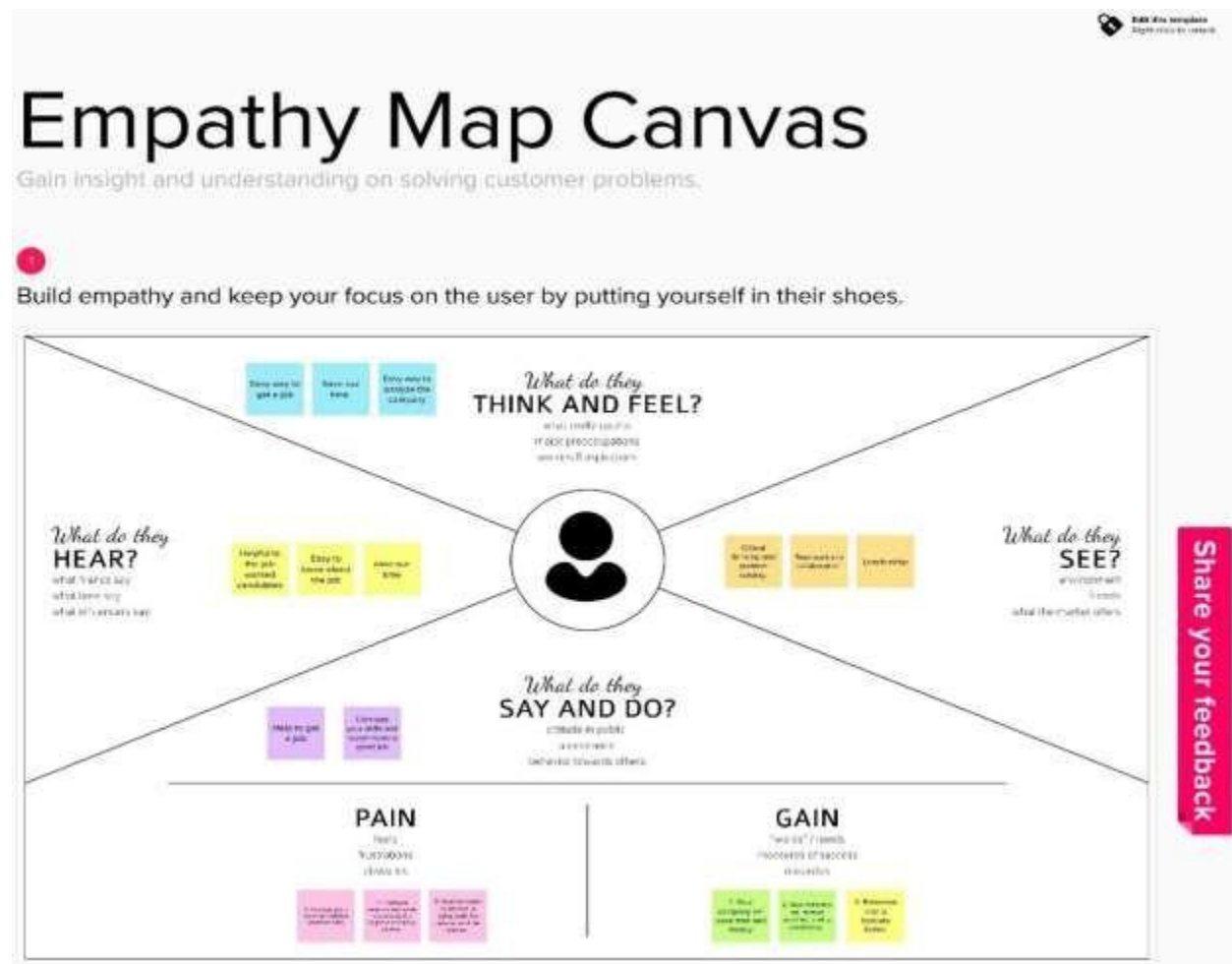
2.3 PROBLEM STATEMENT DEFINITION:

A problem statement is a concise description of the problem or issues a project seeks to address. The problem statement identifies the current state, the desired future state and any gaps between the two. A problem statement is an important communication tool that can help ensure everyone working on a project knows what the problem they need to address is and why the project is important. A problem statement is important to a process improvement project because it helps clearly identify the goals of the project and outline the scope of a project. It also helps guide the activities and decisions of the people who are working on the project. The problem statement can help a business or organization gain support and buy-in for a process improvement project. A good problem statement can be created by identifying and answering several questions related to the problem. The process used to write a problem statement should involve answering questions using a method commonly known as 5W2H. This process involves identifying what the problem is, why it is a problem, when and where the problem was identified, who the problem impacts, how they are impacted by the problem and how much of an impact the problem. A problem statement is important to a process improvement project because it helps clearly identify the goals of the project and outline the scope of a project. It also helps guide the activities and decisions of the people who are working on the project. The problem statement can help a business or organization gain support and buy-in for a process improvement project.

3 . IDEATION AND PROPOSED SOLUTION

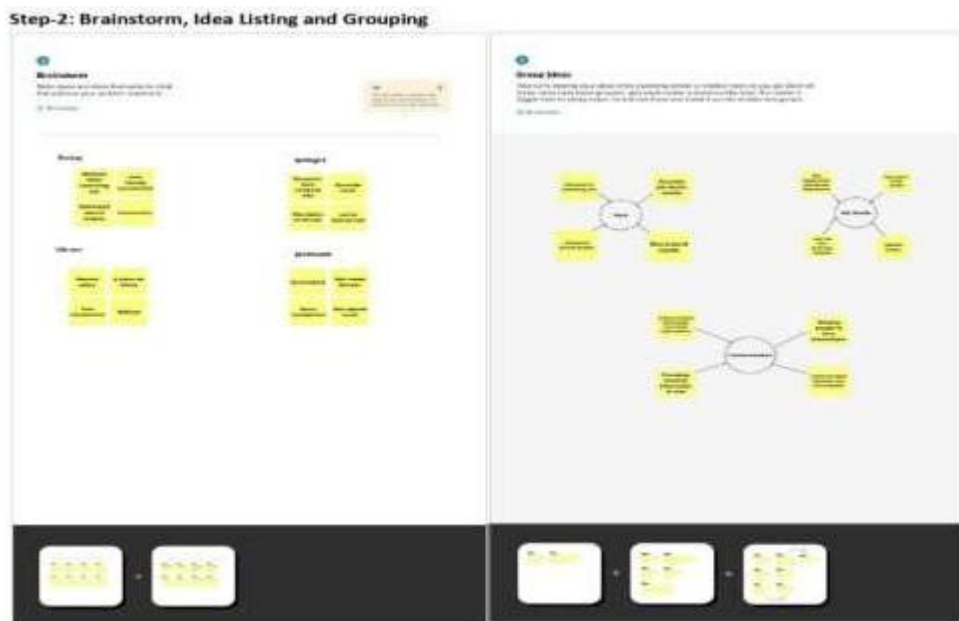
3.1 EMPATHY MAP CANVAS:

An **empathy map** is a collaborative tool teams can use to gain a deeper insight into their customers. Much like a user persona, an empathy map can represent a group of users, such as a customer segment. The empathy map was originally created by Dave Gray and has gained much popularity within the agile community.



3.2 IDEATION AND BRAINSTORMING

Brainstorming is a well-known technique that leverages the interaction between a group of people to create solutions by building on one another's ideas. For more effective brainstorming, use this technique with a group of about five to seven participants.



3.3 PROPOSED SOLUTION:

1.Problem Statement(Problem to be solved):

Recommending the suitable jobs based on the skill set of the user.

2.Idea/Solution description:

We have come up with new innovation solution through which you can directly choose your job relate do 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 skill sets.

3.Novelty/Uniqueness:

In this application we provide feature for applying a job that recommended by application and multilingual chatbot for user convinience.

4. Social Impact/Customer Satisfaction:

Using this application people can easily. Find their domain based jobs from top MNC's using AI technology that suits their skillset.

5. Business Model (Revenue Model):

Revenue can be generated by giving ads in this application and from affiliate commission.

6. Scalability of the Solution:

Skill and job recommender system will provide job recommendations to any kind of skillset. It never fail to show recommendations.

3.4 PROBLEM SOLUTION FIT:

Project Design Phase 1: Solution Fit Template			
Title: SKILL AND JOB RECOMMENDER : Cloud Application Development			
Team ID : PNT2022TMD29798			
Define CS, PM, CC	1. CUSTOMER SEGMENT(S) Who is your customer?	6. CUSTOMER CONSTRAINT What constraint prevents your customer from taking action or limiting their choice of solution?	5. AVAILABLE SOLUTION Which solutions are available to the customer when they face the problem.
	<p>Customers who are not able to solve their own Problem and in need for a possible solution from their agent/job providers.</p>	<p>The problem of contacting the agent and all the problems and procedure in it.</p>	<ul style="list-style-type: none"> They can check FAQ's Section for fast support. If the problem is not solve, they can post the problem in new queries section. Which will be further assisted by the agent team.
Focus on J&P, TM, CH, RC, TR & ME	2. JOBS-TO-BE-DONE/PROBLEMS Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one; Explore different sides?	9. PROBLEM ROOT CAUSE What is the real reason that the problem exists?	7. BEHAVIOR What does your customer do to address the problem and get the job done.
	<ul style="list-style-type: none"> This Application Allows Customers to get recommended job according to their skillset They will be able post their resume and wait for the solution. They will also get solutions to their queries. They can also access our FAQ's Section on our website. 	<p>The only real reason that this problem exists is the lack of awareness and ratio of proven results which could create trust issues with their agent.</p>	<ul style="list-style-type: none"> They must first Post their resume and then wait for 2 hours. They can also use our chatbot to easily contact our Team. They can also refer the FAQ's section.
Identify strong TR & ME	3. TRIGGERS What triggers customers to act.	10. YOUR SOLUTION Our solution involves autonomous system which does the following:	8. CHANNELS of BEHAVIOR
	<ul style="list-style-type: none"> Customers get to know the absolute recommendation to their need. Fast Response. 	<ul style="list-style-type: none"> A personal help desk which can be accessed through all the devices which are compatible with browser. Customers can post their queries in the new thread section. They can also access the FAQ's Section to see if the problem is already listed. They can also view their results progress through their mails. They will get support from the team until the problem gets resolved. 	ONLINE <ul style="list-style-type: none"> For a new query they need an online connectivity to post and receive recommendation from our team. They can also use our chatbot 24/7 While they are online. OFFLINE <ul style="list-style-type: none"> They can Read the messages once it is received through the cloud app. They can access FAQ's while they are offline.
	4. EMOTIONS: BEFORE/AFTER How do customers feel when they face a problem or a job and afterwards.		CH
	<ul style="list-style-type: none"> Enables Customers to Trust to their agent about posting their personal informations. Feeling comfortable with the solution and the company's service. 		Identify strong TR & ME

4 . REQIRMENT ANALYSIS

4.1 FUNCTIONAL REQUIRMENTS:

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Chat Bot	A Chat Bot will be there in website to solve user queries and problems related to applying a job, search for a job and much more.
FR-4	User Login	Login through Form Login through Gmail
FR-5	User Search	Exploration of Jobs based on job filters and skill recommendations.
FR-6	User Profile	Updation of the user profile through the login credentials
FR-7	User Acceptance	Confirmation of the Job.

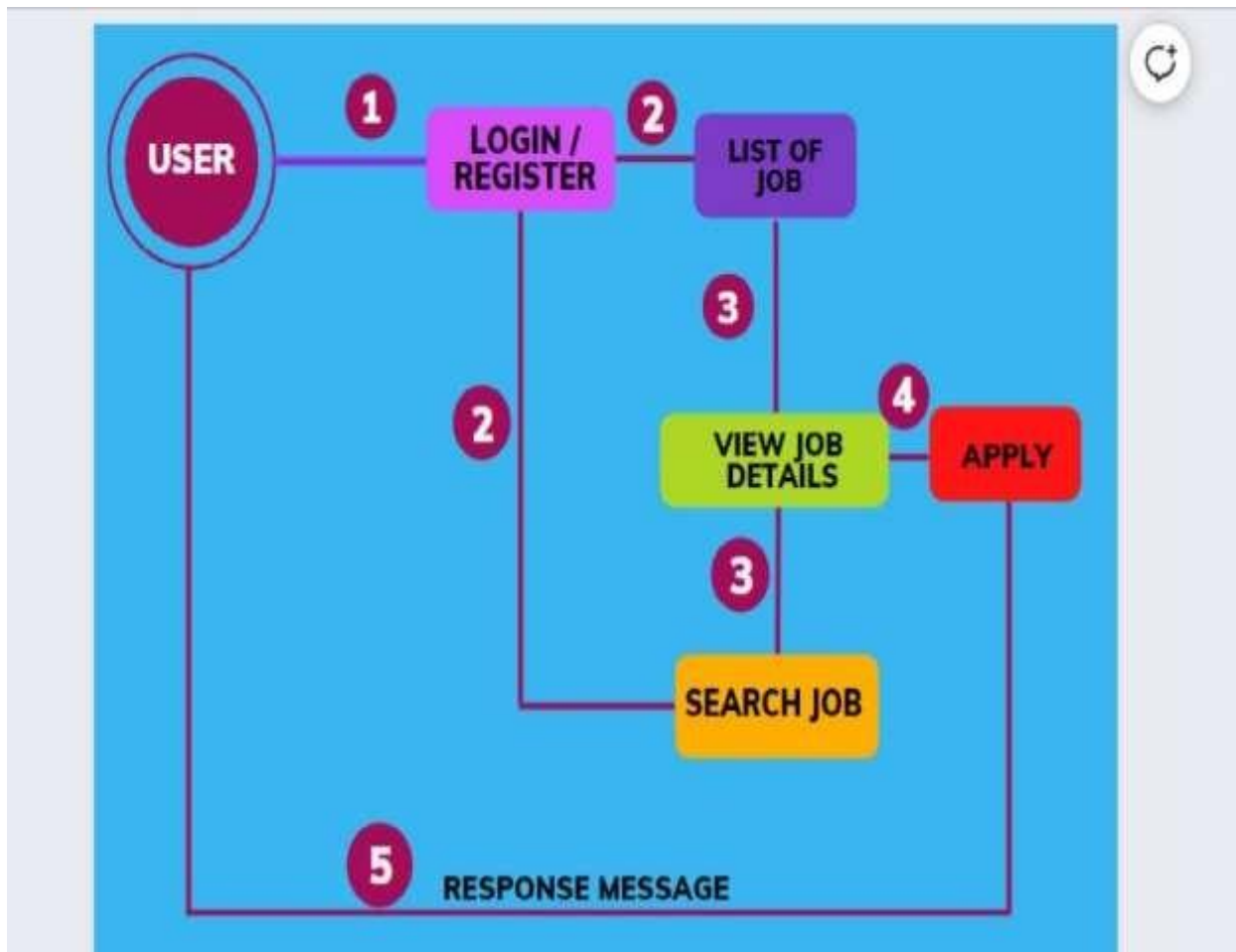
4.1 NON-FUNCTIONAL REQUIREMENTS:

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	This application can be used by the job seekers to login and search for the job based on her Skills set.
NFR-2	Security	This application is secure with separate login for Job Seekers as well as Job Recruiters.
NFR-3	Reliability	This application is open-source and feel free to use, without need to pay anything. The enormous job openings will be provided to all the job seekers without any limitation.
NFR-4	Performance	The performance of this application is quicker response and takes lesser time to do any process.
NFR-5	Availability	This application provides job offers and recommends Skills for a Particular Job openings.
NFR-6	Scalability	The Response time of the application is quite faster compared to any other application.

5 . PROJECT DESIGN

5.1 DATA FLOW DIAGRAMS:

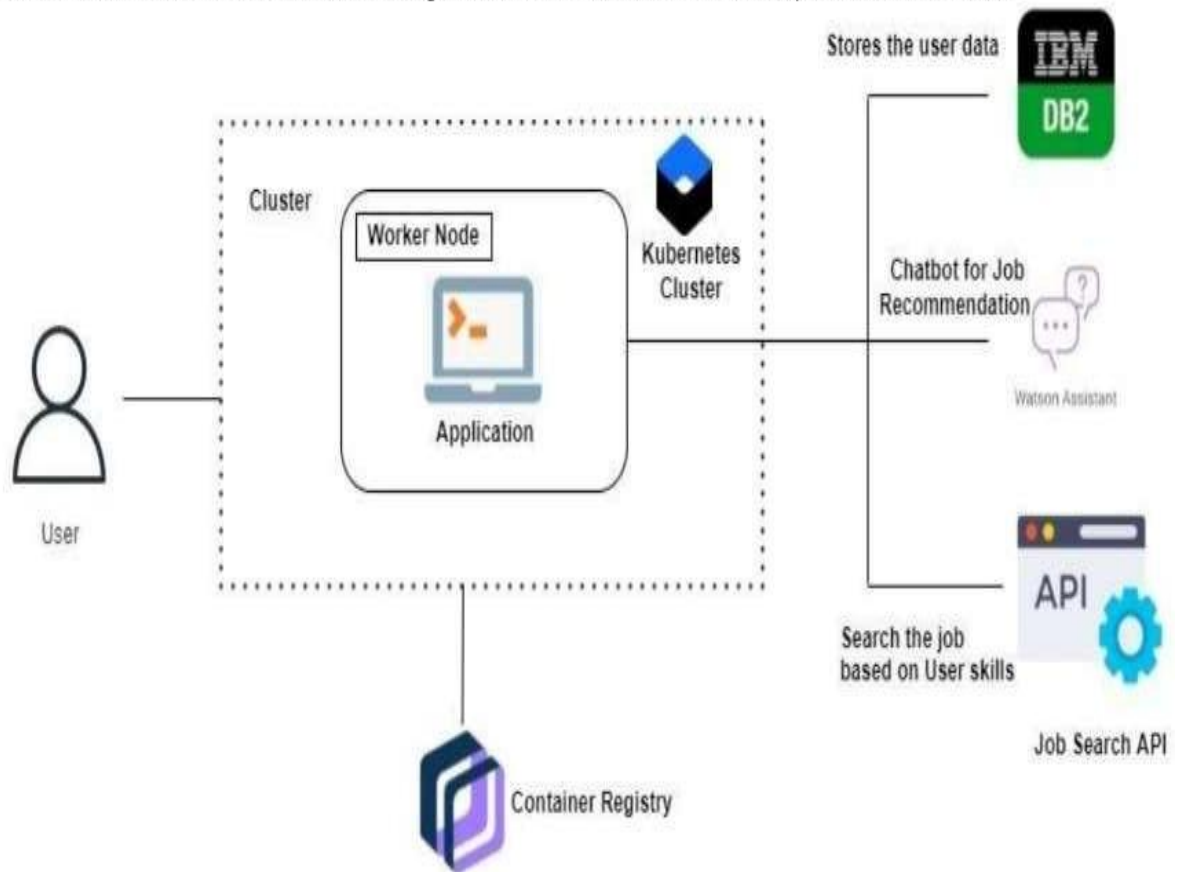
A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enter and leaves the system, what changes the information, and where data is stored.



5.2 SOLUTION AND TECHNICAL ARCHITECTURE:

Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table2



5.3 USER STORIES:

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	I can receive confirmation email & click confirm	Medium	Sprint-1
	Login	USN-5	As a user, I can log into the application by entering email & password	I can access my account / dashboard	High	Sprint-1
	Dashboard	USN-6	Create a model set that contains those models, then assign it to a role.	Assign that group to the appropriate roles on the Roles page	High	Sprint-1
Customer (Web user)	Identity-Aware	USN-7	Open, public access, User-authenticated access, Employee-restricted access.	Company public website. App running on the company intranet. App with access to customer private information.	High	Sprint-1
Customer Care Executive	Communication	USN-8	A customer care executive is a professional responsible for communicating the how's and why's regarding service expectations within a company.	For how to tackle customer queries.	Medium	Sprint-1
Administrator	Device management	USN-9	You can Delete/Disable/Enable devices in Azure Active Directory but you cannot Add/Remove Users in the directory.	Ease of use.	Medium	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	USER: I can register for the application by entering my email, password, and confirming my password.	20	High	Kamalesh Dharun BoshaPranesh PraveenKumar
Sprint-1	Verification	USN-2	USER: I will receive confirmation email for verification	20	High	Kamalesh Dharun BoshaPranesh PraveenKumar
Sprint-2	Login	USN-3	USER: I can log into the application by entering email & password	20	Low	Kamalesh Dharun BoshaPranesh PraveenKumar
Sprint-2	Verification	USN-4	USER: After click login button, It verify the login credentials whether entered details are correct or not.	20	Medium	Kamalesh Dharun BoshaPranesh PraveenKumar
Sprint-3	Dashboard	USN-5	USER: I can access my dashboard after signing in.	20	High	Kamalesh Dharun BoshaPranesh PraveenKumar

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-3	Profile	USN-6	USER: I can set up a profile, and basic details.	20	High	Kamalesh Dharun BoshaPranesh PraveenKumar
Sprint-4	ChatBot	USN-7	USER: I can access the chatbot for job recommendation	20	High	Kamalesh Dharun BoshaPranesh PraveenKumar
Sprint-4	Salary	USN-8	USER: I will be able to know the salary form my job	20	High	Kamalesh Dharun BoshaPranesh PraveenKumar

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	28 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)

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

6.2 SPRINT DELIVERY SCHEDULE:

TITLE	DESCRIPTION	DATE
Literature Survey & Information Gathering	Literature survey on the selected project & gathering information by referring the, technical papers, research publications etc.	16 SEPTEMBER 2022
Prepare Empathy Map	Prepare Empathy Map Canvas to capture the user Pains & Gains, Prepare list of problem statements	16 SEPTEMBER 2022
Ideation	List the by organizing the brainstorming session and prioritize the top 3 ideas based on the feasibility & importance.	19 SEPTEMBER 2022
Proposed Solution	Prepare the proposed solution document, which includes the novelty, feasibility of idea, business model, social impact, scalability of solution, etc.	23 SEPTEMBER 2022
Problem Solution Fit	Prepare problem - solution fit document.	30 SEPTEMBER 2022
Solution Architecture	Prepare solution architecture document.	5 OCTOBER 2022

Customer Journey	Prepare the customer journey maps to understand the user interactions & experiences with the application (entry to exit).	15 OCTOBER 2022
Functional Requirement	Prepare the functional requirement document.	15 OCTOBER 2022
Data Flow Diagrams	Draw the data flow diagrams and submit for review.	15 OCTOBER 2022
Technology Architecture	Prepare the technology architecture diagram.	15 OCTOBER 2022
Prepare Milestone & Activity List	Prepare the milestones & activity list of the project.	22 OCTOBER 2022
Project Development - Delivery of Sprint-1, 2, 3 & 4	Develop & submit the developed code by testing it.	28 OCTOBER 2022 - 13 NOVEMBER 2022

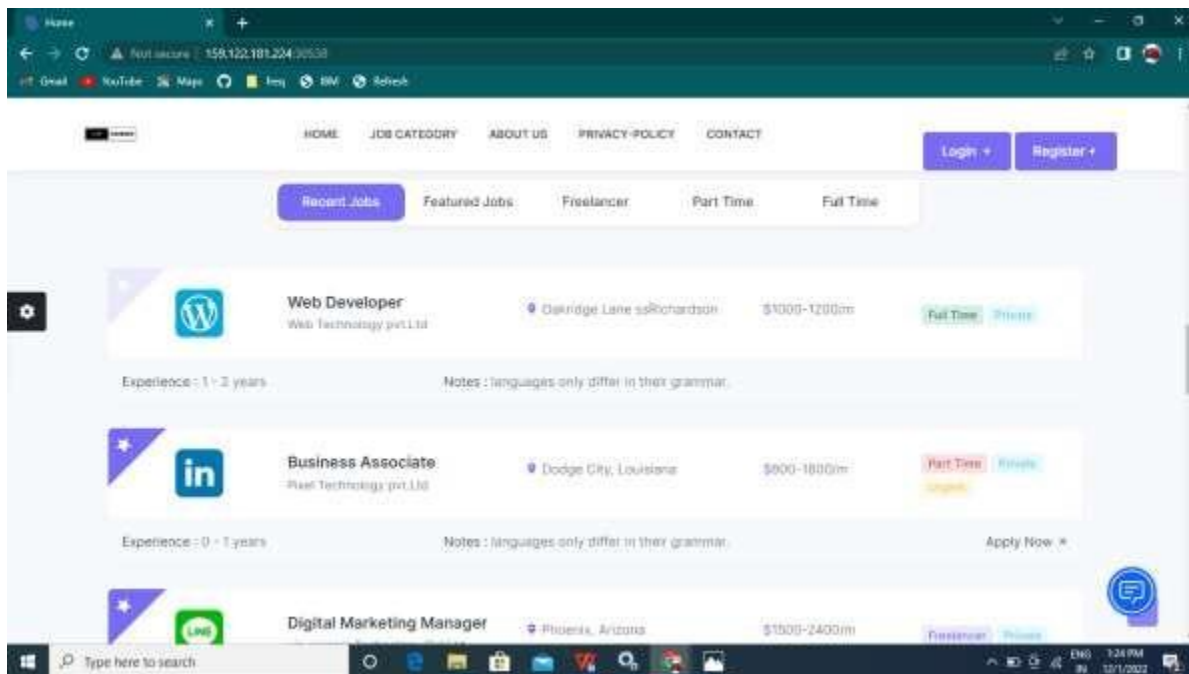
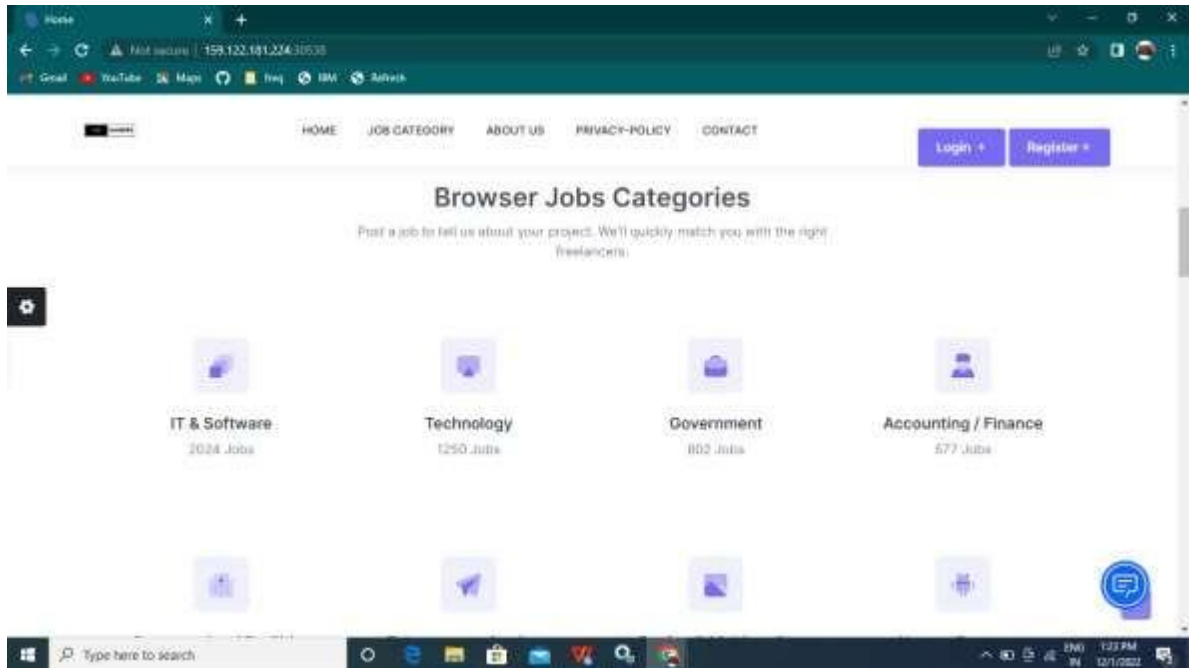
6.3 REPORTS FROM JIRA:

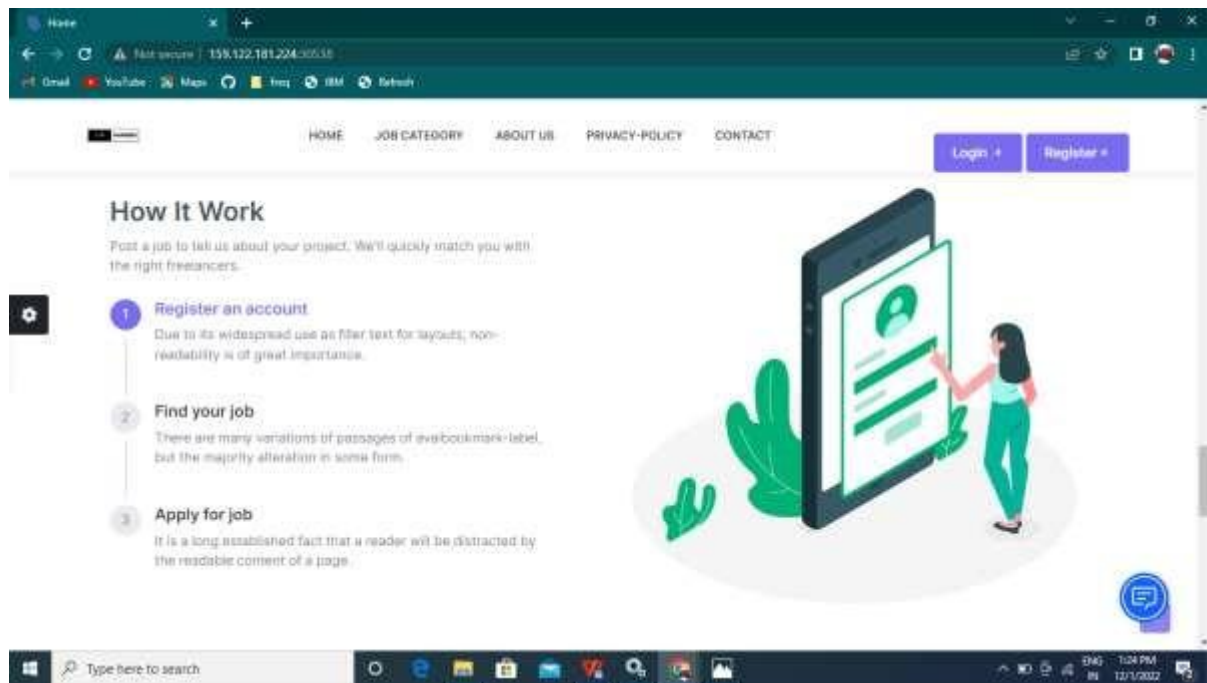


7. CODING & SOLUTIONING:

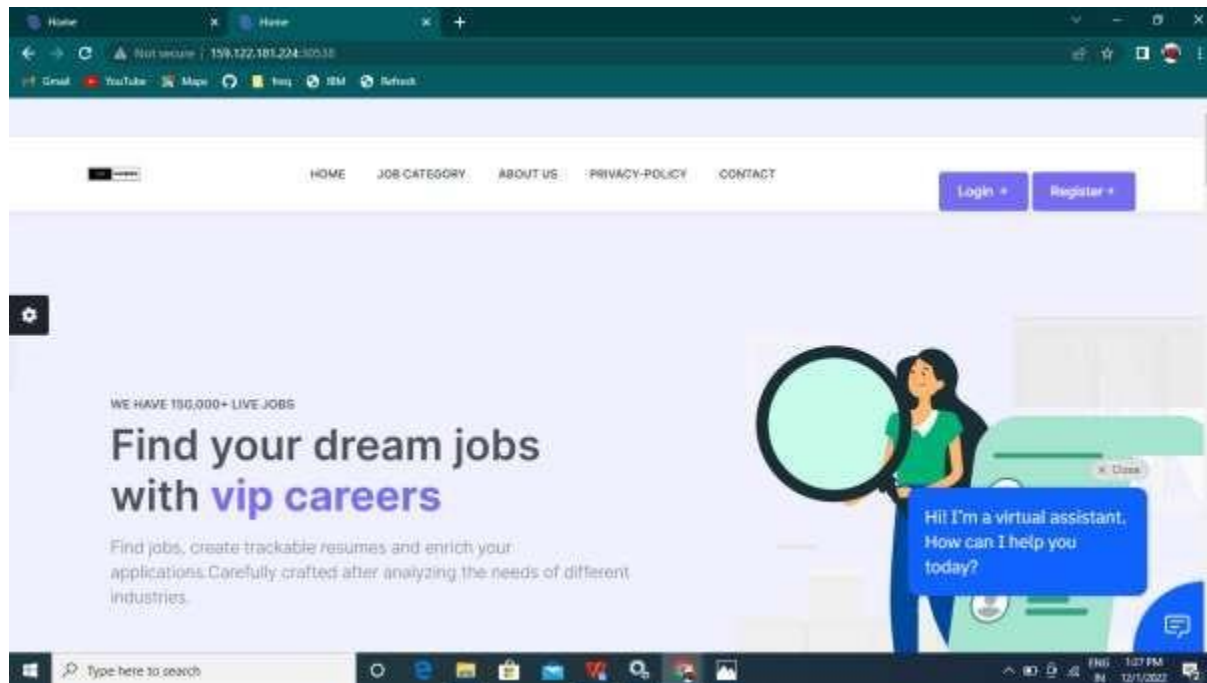
(Explain the features added in the project along with code)

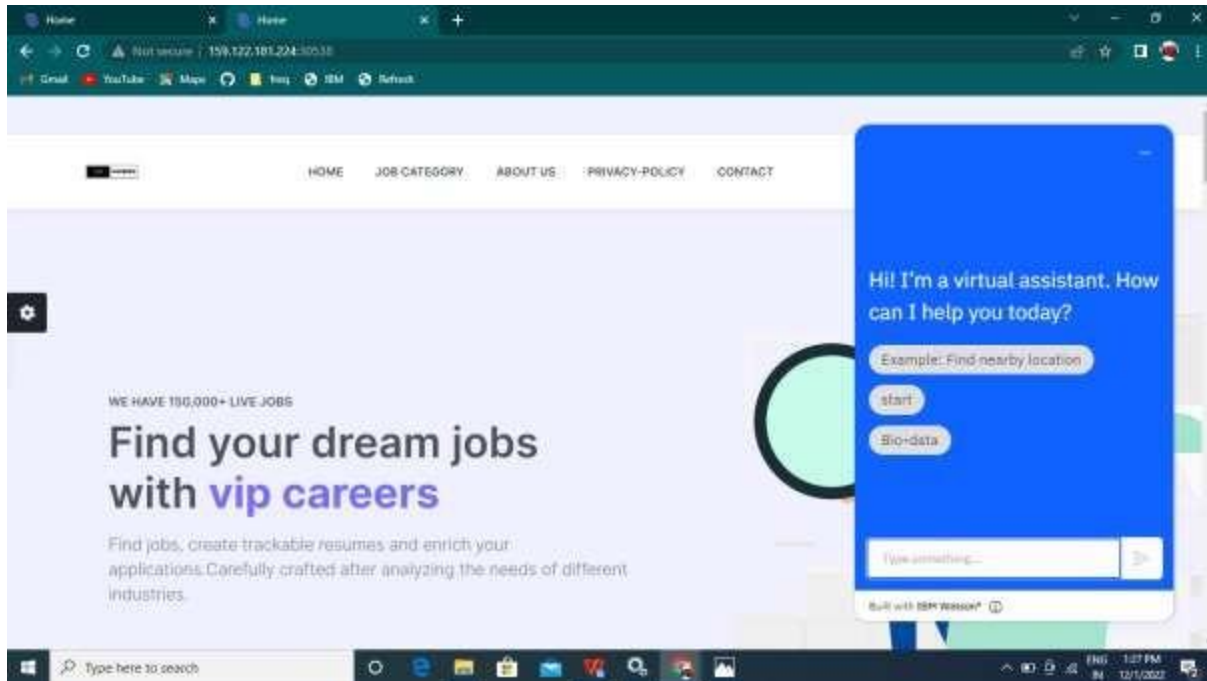
6.1 Features 1: Various Job offers for different domains and skill sets.





6.2 Feature 2: Chat bot feature.





Coding:

App.py

```
from flask import Flask, render_template, redirect, request, url_for, flash, session
from markupsafe import escape
import requests
import json
from turtle import st
import ibm_db
conn = ibm_db.connect("DATABASE=bludb;HOSTNAME=6667d8e9-9d4d-4ccb-
ba321da3bb5aafc.c1ogj3sd0tgtu0lqde00.databases.appdomain.cloud;PORT=30376;SECURITY=SSL;
SSLServerCertificate=DigiCertGlobalRootCA.crt;UID=xcg19604;PWD=4Kk8jwgnitagt74M",'','')
print(conn)
print("connection successful...")
app = Flask(__name__)

app.secret_key = 'gtvhfryj123#@%'

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

url = "https://jsearch.p.rapidapi.com/search"

querystring = {"query":" Web Developer , USA","num_pages":"1"}
```

```

headers = {
    "X-RapidAPI-Key": "",
    "X-RapidAPI-Host": "jsearch.p.rapidapi.com"
}

@app.route("/api", methods=['GET'])
def api():
    response = requests.request("GET", url, headers=headers, params=querrystring)
    data = json.loads(response.text)
    return render_template('index.html', data=data)

@app.route('/signup', methods=['GET', 'POST'])
def signup():
    return render_template('sign-up.html')

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

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

@app.route('/bookmark')
def bookmark():
    return render_template('bookmark-jobs.html')

@app.route('/candidatedetails')
def candidatedetails():
    return render_template('candidate-details.html')
@app.route('/candidategird')
def candidategird():
    return render_template('candidate-gird.html')

@app.route('/candidatelist')
def candidatelist():
    return render_template('candidate-list.html')

@app.route('/companydetails')
def companydetails():
    return render_template('company-details.html')

@app.route('/companylist')
def companylist():

```

```

        return render_template('company-list.html')

email = request.form['email']
password = request.form['password']
print(email,password)

sql = f"SELECT * FROM users WHERE email='{escape(email)}' and
password='{escape(password)}'"
stmt = ibm_db.exec_immediate(conn, sql)
data = ibm_db.fetch_both(stmt)

if data:
    session["email"] = escape(email)
    session["password"] = escape(password)
    return redirect(url_for('dashboard'))

else:
    return render_template('sign-in.html')

```

Output:

```

<ibm_db.IBM_DBConnection object at 0x000002E2109FE2B0> connection
successful...

```

* Serving Flask app 'app'

* Debug mode: on

WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead. * Running on http://127.0.0.1:5000

Press CTRL+C to quit

* Restarting with stat

```

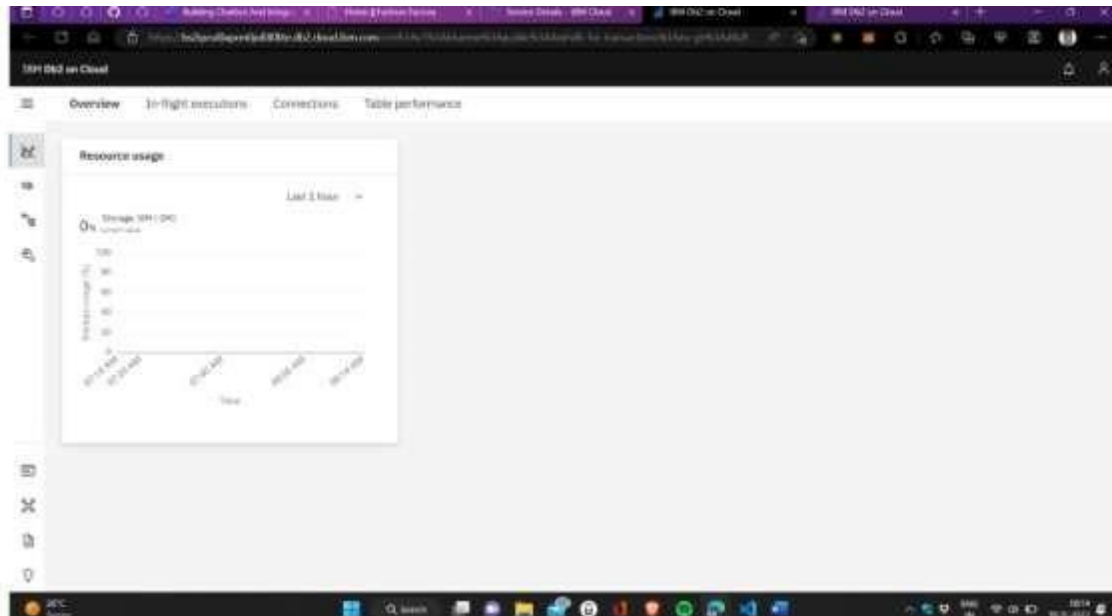
<ibm_db.IBM_DBConnection object at 0x0000026E897ECEB0> connection
successful...

```

* Debugger is active!

* Debugger PIN: 572-315-639

7.3 DATABASE SCHEMA (IF APPLICABLE):



The screenshot shows the 'Schemas' and 'Tables' pages in the IBM Db2 on Cloud console. The 'Schemas' page displays a table with the following data:

Name	Type	Tables
PGWA2194	User	1

The 'Tables' page displays a table with the following data:

Name	Schema	Properties
SPR6	PGWA2194	

Both pages include a 'Refresh' button and a 'Total: 1, selected: 1' indicator at the bottom.

8. TESTING

Software testing is used to assess the quality of the product. Software testing can also provide an objective, independent view of the software to allow the business to appreciate and understand the risks of software implementation. 8.1

TEST CASES:

Testcase1: Does the flask application is perfectly created and in works in very good condition?

Testcase2: Does the Send-Grid integration is working correctly?

Testcase3: Does the db2 is perfectly connected to the application?

Testcase4: Can the chat-bot which is created using Watson assistant is correctly recommending the job for the end users?

Testcase 5: Whether the application is working correctly without any interruptions?

8.2 USER ACCEPTANCE TESTING:

User acceptance testing is a type of testing that is used to determine whether a software system is suitable for use by end users. It is the process of verifying that a system meets the requirements of the user, and that the user can use the system for its intended purpose. User acceptance testing (UAT) is a process of verifying that a system meets the needs of the end users and that they can use it. This can be done through a variety of methods, such as interviews, surveys, or observation. UAT is important in water quality analysis and prediction because it helps ensure that the system being developed will be useful to those who will be using it. By testing with act users, developers can get feedback on the system and make sure it is meeting the needs of the users.

9. RESULTS

9.1 PERFORMANCE METRICS:

a) Implementation of web application:

To create the web application to interact with the users. The users here is commonly job seeker and job provider. Login, Signup, Job searching have separate pages where we can access into different work functions.

b) SendGrid Integration:

The flask application that we created is to get integrated with sendgrid which provide the e-mail interface for communication purpose.

c) Developing chatbot:

To develop a chat-bot so that, that can be very interactive to the users who are using the application and to recommend the jobs based on the job seekers interests.

d) Deployment of Application:

Finally, the developed application is to be deployed in the cloud.

1. Accuracy

The accuracy metric is one of the simplest Classification metrics to implement, and it can be determined as the number of correct predictions to the total number of predictions.

To implement an accuracy metric, we can compare ground truth and predicted value in a loop.

10. ADVANTAGES AND DISADVANTAGES

ADVANTAGES:

- The main advantage of our application is that there is a direct one-way communication between the user and the company.
- There is a chat-bot which gives the directions to the users what the user get benefit and it recommends the jobs available based on the user interest.
- The application is an open source one which does not ask for the money.

DISADVANTAGE:

- One disadvantage of the application is that it is not a full paced one.
- Another disadvantage of skill and job recommender application is that it is unaware of machine language stack. No AI is implemented here.

11. CONCLUSION

In this work, we have presented our proposal for the automatic recommendation of new job arrival. Our goal here is being able to build methods being able to deliver appropriate new job to those users that could be potentially interested on that updated one. To do that, we have based our research efforts on two well-known classification methods: random forests (RF) and support vector machines (SVM). Our empirical evaluation shows us interesting facts. For example, RF are more likely to be interpreted although they do not present a particularly good performance in relation to SVM. On the other hand, SVM are more accurate, although they work with a model being much harder to interpret by human. What it is clear is, that in both cases, we have shown that these two methods are quite appropriate for accurately working in the context of automatic skill and job application. The users do not know the trend only because of lack of trending skill set in their domain or missing out new arrivals. When a user is missing out new job because not of getting the notification, he might lose the trending fashion which he really deserved for it. The main purpose of the skill and job recommender application is to provide new fashion for every single person. The only thing the customer wants to do is just to approach the application and apply for the skill and job application. He will be provided with the login credentials with the confirmation email. There he can find numerous of new job. Customers will be guided with the in-built chat bot, which guides the new fashion to apply for the skill and the availability of job based on their interest. The chat bot is built with IBM Watson Assistant that is very much helpful in collecting the information on jobs and guides them to apply for it.

12. FUTURE SCOPE

As future work, we propose to design novel computational methods being able to process the textual description from the fashion arrivals. At that point, we were using just the quantitative information that is advertised. However, we think that the way an offer is written can help attracting potential candidates as well, maybe new methods for natural language processing using neural networks could help in this task. We also would like to explore the possibilities to work with expert knowledge via kernel mapping in the case of SVM as we mentioned earlier. Finally, it is also necessary to study how to integrate this technology with existing web information systems so that these two methods can be put into operation by the industry.

13. APPENDIX

13.1 CERTIFICATES:





This is to certify that


DHARUN T

successfully completed and received a passing grade in

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13.2 SOURC

E CODE:

App.py:

```
from flask import Flask, render_template, redirect, request, url_for, flash, session
from markupsafe import escape
import requests
import json
from turtle import st
import ibm_db
conn = ibm_db.connect("DATABASE=bludb;HOSTNAME=6667d8e9-9d4d-4ccb-
ba321da3bb5aafc.clogj3sd0tgtu0lqde00.databases.appdomain.cloud;PORT=30376;SECURITY=SSL;
SSLServerCertificate=DigiCertGlobalRootCA.crt;UID=xcg19604;PWD=4Kk8jwgnitagt74M",'','')
print(conn)
print("connection successful...")
app = Flask(__name__)

app.secret_key = 'gtvhfryj123#@%'

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

url = "https://jsearch.p.rapidapi.com/search"

querystring = {"query": " Web Developer , USA", "num_pages": "1"}

from flask import Flask, render_template, redirect, request, url_for, flash, session
from markupsafe import escape
import requests
import json
from turtle import st
import ibm_db
conn = ibm_db.connect("DATABASE=bludb;HOSTNAME=6667d8e9-9d4d-4ccb-
ba321da3bb5aafc.clogj3sd0tgtu0lqde00.databases.appdomain.cloud;PORT=30376;SECURITY=SSL;
SSLServerCertificate=DigiCertGlobalRootCA.crt;UID=xcg19604;PWD=4Kk8jwgnitagt74M",'','')
print(conn)
print("connection successful...")
app = Flask(__name__)

app.secret_key = 'gtvhfryj123#@%'
```

```

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

url = "https://jsearch.p.rapidapi.com/search"

querystring = {"query": " Web Developer , USA", "num_pages": "1"}
headers = {
    "X-RapidAPI-Key": "",
    "X-RapidAPI-Host": "jsearch.p.rapidapi.com"
}

@app.route("/api", methods=['GET'])
def api():
    response = requests.request("GET", url, headers=headers, params=querystring)
    data = json.loads(response.text)
    return render_template('index.html', data=data)

@app.route('/signup', methods=['GET', 'POST'])
def signup():
    return render_template('sign-up.html')

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

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

@app.route('/bookmark')
def bookmark():
    return render_template('bookmark-jobs.html')

@app.route('/candidatedetails')
def candidatedetails():
    return render_template('candidate-details.html')
@app.route('/candidategird')
def candidategird():
    return render_template('candidate-gird.html')

@app.route('/candidatelist')
def candidatelist():

```



```

        return render_template('candidate-list.html')

@app.route('/companydetails')
def companydetails():
    return render_template('company-details.html')

@app.route('/companylist')
def companylist():
    return render_template('company-list.html')

email = request.form['email']
password = request.form['password']
print(email,password)

sql = f"SELECT * FROM users WHERE email='{escape(email)}' and
password='{escape(password)}'"
stmt = ibm_db.exec_immediate(conn, sql)
data = ibm_db.fetch_both(stmt)

if data:
    session["email"] = escape(email)
    session["password"] = escape(password)
    return redirect(url_for('dashboard'))

else:
    return render_template('sign-in.html')

```

dockerfile:

```

1 FROM python:3.10.6
2 WORKDIR /app
3 COPY requirements.txt ./
4 RUN pip install -r requirements.txt
5 COPY . .
6 EXPOSE 5000
7 CMD ["python", "./app.py"]

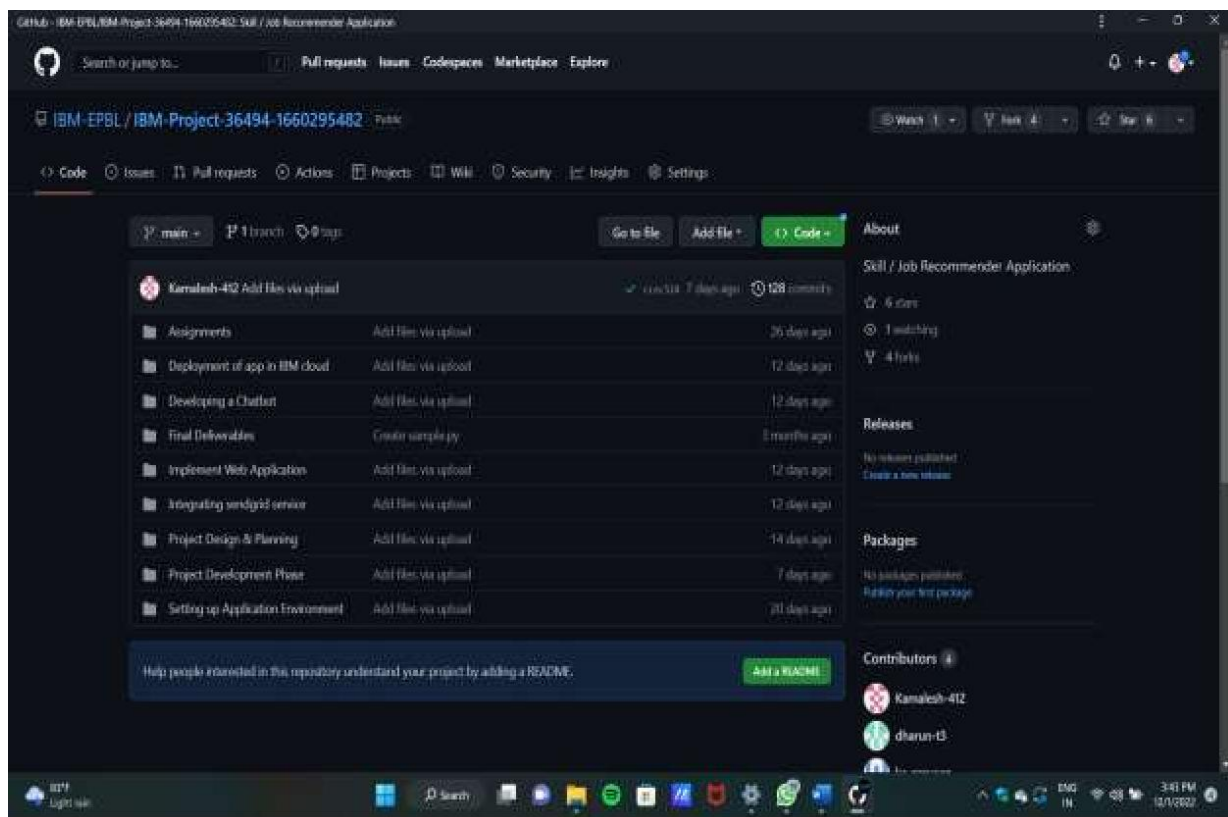
```

13.3. PROJECT DEMO LINK:

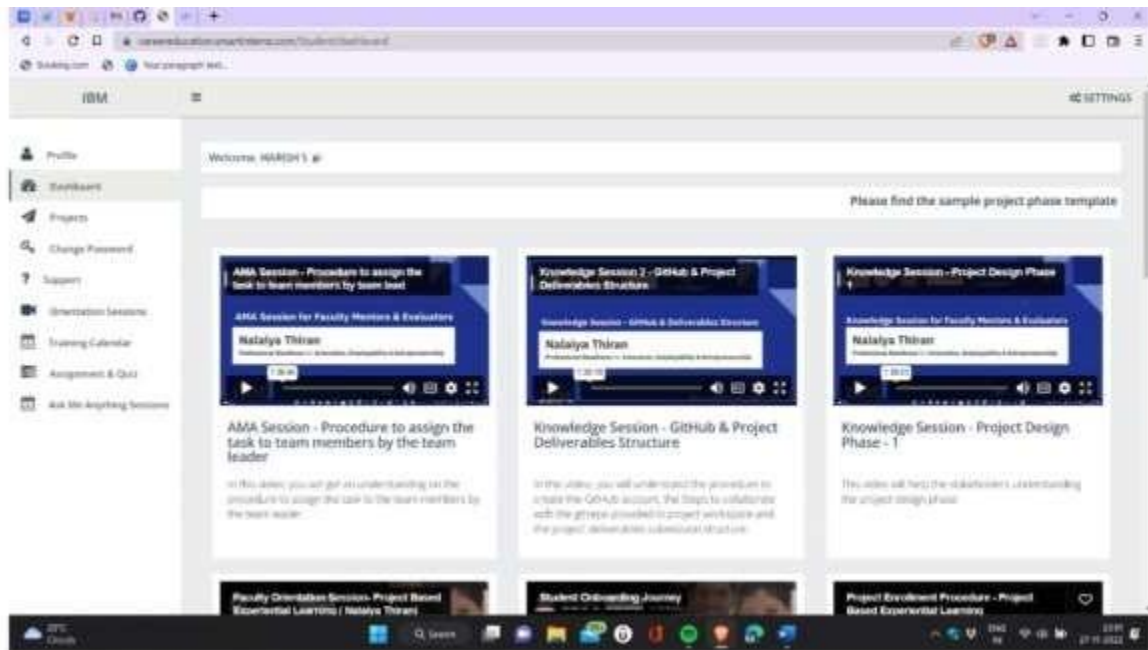
Project demo link:

<https://youtu.be/ef0mkmK1ofI>

GITHUB:



13.4 IBM LOGIN DASHBOARD:



13.5 GITHUB LINK:

<https://github.com/IBM-EPBL/IBM-Project-36494-1660295482>

13.7 QUIZ GOOGLE FORM LINK:

Cloud Application Development - Quiz 1

The form Cloud Application Development - Quiz 1 is no longer accepting responses.
Try contacting the owner of the form if you think this is a mistake.

Cloud Application Development - Quiz 2

The form Cloud Application Development - Quiz 2 is no longer accepting responses.
Try contacting the owner of the form if you think this is a mistake.

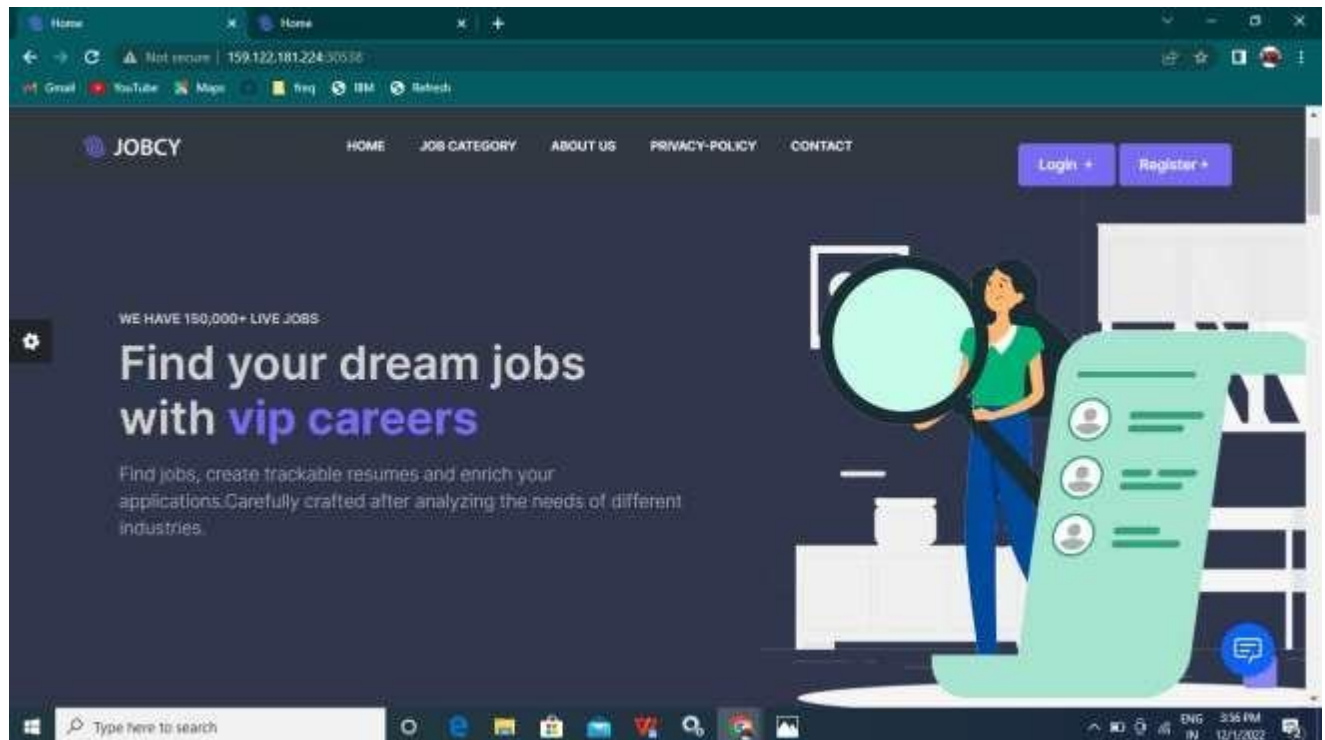
Cloud Application Development - Quiz 3

The form Cloud Application Development - Quiz 3 is no longer accepting responses.
Try contacting the owner of the form if you think this is a mistake.

Cloud Application Development - Quiz 4

The form Cloud Application Development - Quiz 4 is no longer accepting responses.
Try contacting the owner of the form if you think this is a mistake.

13.8 PROJECT OUTCOME FINAL FRONT END:



13.9 MENTOR EVALUATOR DISCUSSION PHOTOS:

