PROJECT NAME: SKILL/JOB RECOMMENDER APPLICATION

PROJECT REPORT

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1.INTRODUCTION

The increase in usage of Internet has heightened the need for online job hunting. According to Job site's report 2014, 68% of online job seekers are college graduates or post graduates. The key problem is that most of the job-hunting websites just display the recruitment information to website viewers. Students have to go through all the information to find the jobs they want to apply. The whole procedure is tedious and inefficient. We need an easy job recommendation system where everyone will have a fair and square chance. This saves a lot of potential time and money both, on the industrial as well as the job seeker's side. Moreover, as the candidate gets a fair chance to prove his talent in the real world it is a lot more efficient system. The basic agenda of every algorithm used in today's world, be it a traditional algorithm or a hybrid algorithm, is to provide a suitable job that the user actually seeks and wishes for.

1.1 Project Overview

Nowadays, searching for a job on the Internet is a regular practise using job search engines like LinkedIn1, Indeed2, and others. A job seeker can typically use these sites in one of two ways:

1) Building and/or updating a professional profile containing information related to his/her education, professional experience, professional skills, and other, and receiving personalised job recommendations based on this data.

2) Conducting a search based on keywords related to the job vacancy that he/she is looking for. Sites that support the first scenario are more widely used and have a simpler layout, but their recommendations are less precise than those of the sites that use profile data

Project Workflow:

- The user interacts with the application.
- Registers by giving the details.
- Integrate the application with job APIs and store the data in the database.
- The database will have all the details and the user can search a job.

1.2 PURPOSE

In a recommendation report, solutions to problems or needs are suggested or recommended. The report's objectives include comparing many choices, recommending one, and endorsing that suggestion. Your efforts to acquire talent must increasingly rely on your career's webpage. It's more than simply an online notice board; it plays a big role in how a potential employee sees you as an employer. It requires time, energy, and effort to ensure that it is operating as effectively as possible. It is not simply a small piece of technology; it is an essential component of your talent attraction strategy.

2. LITERATURE SURVEY

In the Paper [1], Amer AI-Badarenah et al. have proposed a system which recommends student courses based on the courses taken by their peers, having similar interests. The similar interest students are then grouped based on their grades. Clusters are created by using the nearest

neighbor algorithm. Their system also predicts grades that the student will achieve if they take up that course. The author has used Manhattan distance to find similarity between two students by calculating the distance between their grades in common subjects and to form clusters. After the clusters are formed, the similarity of the student in interests and the cluster is found from the group by using the n-nearest neighbor algorithm. Course association rules are used in finding recommendations. It is found that in some scenarios the algorithm's performance is low. The prediction depends only on the grades which may not help in knowing the students entire potential. Sh. Asadi et al. talk about using both clustering and fuzzy logic to predict courses. The author uses a clustering algorithm to group similar kinds of students and fuzzy logic to find association rules. PCA is used to decrease the number of components. The clustering is done with K means algorithm and the maximum number of clusters considered in this paper are 5.Student's scores are labeled as low, medium, high. If two regions have equal membership that is if students mark in a subject belongs to two different regions with equal membership then both will be added in a set of rules. This is a drawback. Feng-Hsu Wanh et al. [3] Talks about improving the recommendation system of websites and making the user's experience personalized. They have integrated clustering with the associative-mining method. The customers are clustered based on the time-framed navigation session assuming that their preference may change with time. For the selection of a good time frame they have used the Hierarchical Bisecting Medoids Algorithm. The nearest cluster is found and association rule is applied to that cluster. The maximum matching method preserves the sessions and finds maximum pages that match the rules and pages will be displayed whose confidence is beyond a threshold. This paper suggests that this method will be ideal in education system courses recommendation. However, the drawback of this system is that a customer won't be given recommendations if there are no pages match the association rule. Huiyi Tan et al.

[4] Propose a system that can generate recommendations for E-Learning. They collect the data of the user as previous interest and frequently visited pages are considered. Different recommendation models are stored in a separate dataset and the model is randomly selected. Once the model is selected the useful information from the user's history and recommendations are generated based on the algorithm that the model uses and sent back to the E-Learning websites.

2.1 EXISTING SYSTEM

The developed system consist of three modules: college campus recruitment system, keyword based search from online recruitment sites and Android application. In college campus recruitment system student's profiles and company's profiles are collected. Students profile generated by taking information from students through registration and login portal. Company's profile will be generated by the admin from the information and requirement provided by the company to admin. Aher that profile matching is perform on the students and company's profiles. In second module i.e., keyword based search module students have the provision to search for the companies from various online recruitment sites. Web crawling technique is used for searching through these sites. Students have to put the keyword e.g. C# and web crawler searches for those companies who have vacancies for C# developers through various online recruitment sites like Naukri.com.

RELATED WORK:

As we have seen, the present-day job seeker is faced with an array of problems before they can find a suitable job for themselves. All existing work is so promising but lacks in some of the other aspects. The need is to eliminate these issues posed by past research and minimize the weaknesses of the systems. The proposed system is designed to go forth with developing a fully functional user interface supporting a job aggregator and recommendation system. Every aspect of the operation is made from scratch and in a customized sox of manner. Hence, the problem statement devised by us as a building starter for the research is as follows:

Developing a hybrid model that aggregates and recommends relevant jobs to the user based on their profile, skills, or interests.

Emphasizing quality over quantity and delivering only the most appropriate results to the user. The results were achieved by applying intelligent filters and filtering out great amounts of data using appropriate parameters.

Recommending jobs to users of any age and background in real time, based on the popularity of jobs among the other user base. Additionally, allowing users to study job popularity, skill demand, grossing market skills, etc. are discussed.

Finally, designing a fully useable and understandable UI for the Recommender System for practical usage.

The proposed system consists of the following three major modules, which are completed as part of this research as follows:Data collection and preprocessing followed by the unification of the database.

Recommendation of suitable results using a hybrid system of content- based and collaborative filtering. Development of a fully functional user interface in the form of a web application.

2.1 REFERENCE:

- 1.AI-Badarenah, A. and Alsakran, J., 2016. An automated recommender system for course selection. International Journal of Advanced Computer Science and Applications, 7(3), pp.166-175.
- 2. Asadi, S., Jafari, S. and Shokrollahi, Z., 2019. Developing a Course Recommender by Combining Clustering and Fuzzy Association Rules. Journal of AI and Data mining, 7(2), pp.249-262.
- 3. Wang, F.H. and Shao, H.M., 2004. Elective personalized recommendation based on time-framed navigation clustering and association mining. Expert systems with applications, 27(3), pp.365-377.
- 4.H. Tan, J. Guo and Y. Li, "E-learning Recommendation System," 2008 International Conference on Computer Science and Software Engineer- ing, Hubei, 2008, pp. 430-433.
- 5.IEEE International Conference on Computing, Power and Communication Technologies (GUCON)GaIgotias University, Greater Noida, UP, India. Oct-2020.Students, Computer Science & Engineering, K K Wagh College of Engineering, Nashik, India.
- 6.The International Workshop on Artificial Intelligence and Smart City Applications (IWAlSCA)August 9-12, 2020, Leuven, Belgium Job Recommendation based on Job Profile Clustering and Job Seeker Behavior.

2.3 PROBLEM STATEMENT DEFINITION

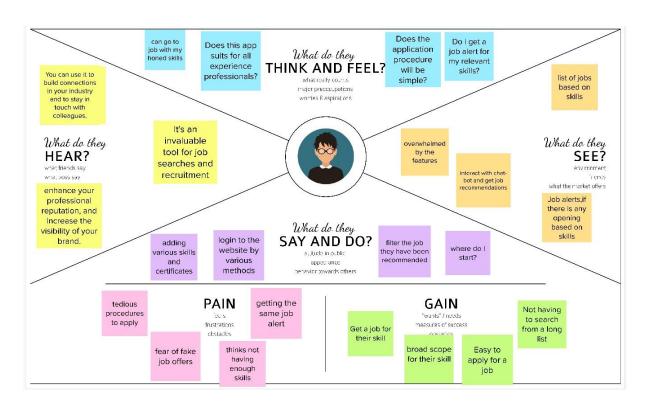
Having lots of skills but wondering which job will best suit you? Don't need to worry!

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

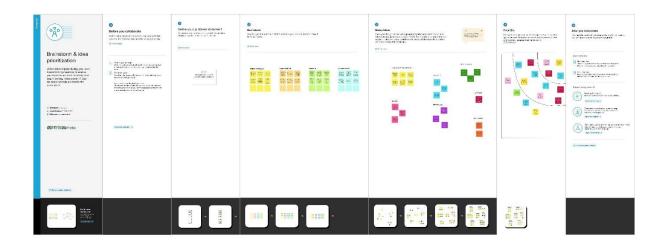
To develop an end-to-end web application capable of displaying the current job openings based on the user skillset. The user and their information are stored in the Database. An alert is sent when there is an opening based on the user skillset. Users will interact with the chatbot and can get the recommendations 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

3. IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS



3.2 IDEATION AND BRAINSTROMING



3.3 PROPOSED SOLUTION

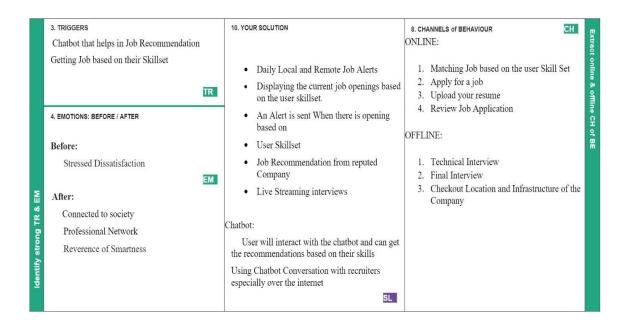
S. No.	Parameter	Descriptio n
1.	Problem Statement(Problem to be solved)	To create a complete web application that can show available jobs based on the user's skill set.

2.	Idea/Solution description	In this paper, we presented a structure for the duty of employment recommendations. According to the preferences of the job recommender system creator, this architecture both makes it easier to grasp how the job suggestion process works and permits the use of a variety of text processing and recommendation methods. Additionally, we contribute by making a fresh dataset with profiles of job searchers and open positions publicly accessible. Future areas of our research will centre on conducting a more thorough review taking into account a larger number of methodologies and data as well as a thorough evaluation of the impact of each job seeker's professional skill on the recommendation they obtain for a position.
3.	Novelty/ Uniqueness	As information technology advanced and the Internet became more widely used, people gradually moved from an era of information scarcity to one of information overload. User satisfaction with recommender systems is correlated with both the degree of support provided to the user's decision-making as well as the accuracy of the system's recommendations. One crucial indicator of client happiness is novelty. The field of recommender systems (RS) is increasingly realising that novelty is a crucial component of suggestion effectiveness and added value. The originality of an item in a recommendation system was determined in this work by combing research findings on the definition and algorithm of novel recommendations. An experiment showed that the definition of novelty may be used to accurately identify and recommend items that the user is already familiar with.
4.	Social Impact/Customer Satisfaction	We create a number of recommender systems and evaluate their propensity to provide correct and varied recommendations as well as their capacity to produce customer satisfaction from a variety of data sources. The findings demonstrate that when a deep learning- based recommender system is used, accuracy and diversity have a beneficial impact on consumer satisfaction. In contrast, when using conventional recommender systems, only accuracy has a beneficial impact on customer satisfaction. These findings show that recommender system developers or managers must find ways to increase client satisfaction with the system and support the long-term growth of e-commerce.

5.	Business Model(Revenue Model)	Brands can customise the consumer experience by using recommendation systems to propose the content that most closely matches their needs. Businesses can also use a recommendation engine to analyse consumer usage patterns and browsing patterns in order to provide pertinent service and product recommendations.
6.	Scalability of the Solution	A recommendation system is a strategy that presents users with content they may be interested in or have already accessed. Traditional recommender systems like content and collaborative filtering are utilised in a wide range of applications including e-governance, social media, marketing, and education.

3.4 PROBLEM SOLUTION FIT





4. REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENT

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirer (Epic)	nentSub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through LinkedIN
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Chatbot	To solve user's queries regarding searching/applying for a job etc
FR-4	User Logic	Login through forms Login through Gmail account
FR-5	User Profile	Update user's details/resume
FR-6	Search For Jobs	Based on Job filters and skill recommendations

FR-7	Alert Users	Notify users when relevant openings and deadlines come
		up.

4.2 NON-FUNCTIONAL REQUIREMENT

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

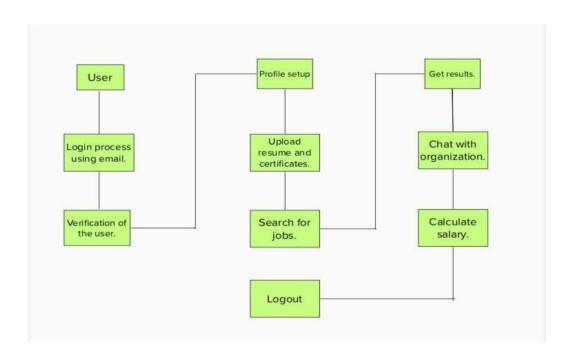
FR No.	Non-Functional Requirement	Description
NFR-1	Usability	Useful for job seekers to login and search for jobsbased on his/her skill set
NFR-2	Security	Secured login for users by password or gmail account.
NFR-3	Reliability	To make sure that the system performs without failure in above 90% of use cases within a month.
NFR-4	Performance	To decrease the server response time by how, the application performs faster.

NFR-5	Availability	The application shall be monitored so that the server down time is minimized and is available.
NFR-6	Scalability	The application can be scaled up and down easily since Kubernetes is used to orchestrate the application

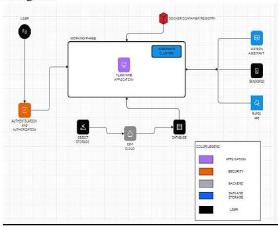
5.PROJECT DESIGN

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 clearDFD 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.



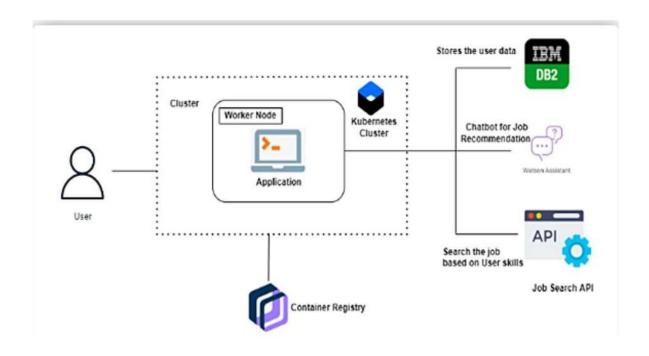
Flow Diagram:



Guidelines:

- 1. Registration using form, Gmail
- 2. Confirmation using OTP, gmail
- 3. flask app -using python library
- 4. first Homepage with login and register
- 5. In Homepage showing post job and apply job
- 6. Login page- login and confirmation message
- 7. register page- register an confirm using OTP or email
- after Login-dashboard showing more jobs and can search specific job
 Login and register database are stored in IBM DB2
- 10. OTP Messages are sent through Send grid
- 11. Rapid api is connected to display jobs and to search jobs
- 12. Files can be stored in IBM Storage
- 13. Services are received from IBM Cloud account

5.2 SOLUTION & TECHNICAL ARCHITECTURE



5.3 USER STORIES

User Type	Functional Requirement (Epic)		User Story / Task	Acceptance criteria	Priority	Release
Customer	Registration	USN-1	As a user, I can		High	Sprint-1
(Mobile user)			register for the application by entering my email, password, and confirming my password.	my account /dashboard		
		USN-2	As a user, I will receive confirmation	I can	High	Sprint-1

			email once I have registered for the application.	rece ive conf irma tion email & click confirm		
		USN-3	As a user, I can register for the application through Facebook.	I can register & access the dashboard with FacebookLog in		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.		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.	perform	Medium	Sprint-1
Customer Ca Executive	reChatbot	USN-8	As a user, I can seek guidance from the customer care executive.		High	Sprint-1

Administrator	DBMS	USN-9	As a	administra	tor, I	I ca	ın High	Sprint-1	
			can	keep	the	perform			
			appli	cations of	your	various			
			orgar	nization reli	es on	modification	n		
			runni	ing.		s in the			
						application	s.		

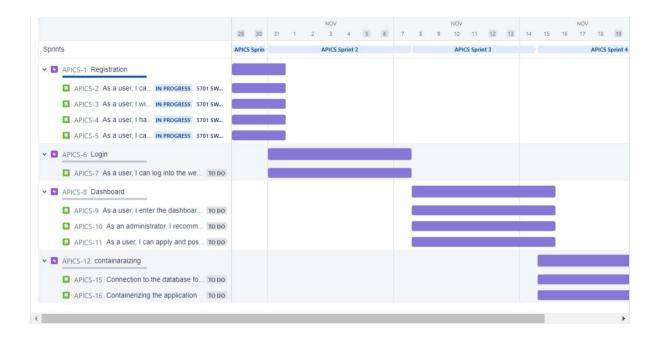
6.PROJECT PLANNING & SCHEDULING

Sprint	Functional	User	User Story/Task	Story	Priority	Team Members
	Requirement(Epic)	Story		Points		
		Number				
Sprint-1	Registration	USN-1	As a user, I can register for the website by entering my email, password, and confirming my password.	2	High	Aysha Haslin M
Sprint-1	Registration	USN-2	As a user, I will receive confirmation email once I have registered for the application.	3	High	Aysha Haslin M
Sprint-1	Login	USN-3	As a user, I have to enter my Login Credentials To watch daily job updates.	2	Medium	Swetha N
Sprint-1	Login	USN-4	As a user, I can register for the website through G-mail.	4	High	Aysha Haslin M
Sprint-2	Dashboard	USN-5	As a user, I can log into the website by entering email & password	4	Medium	Shreenivas K M
Sprint-2	Dashboard	USN-6	As a user, I enter the dashboard and learn new skills.	5	High	Swetha N
Sprint-3	Dashboard	USN-7	As an administrator, I recommend new job	3	High	Shreenivas K M
Sprint-3	Source of Job	USN-8	As a user, I can apply and post job based on category	3	Medium	Mohammed aziz A
Sprint-4	Database	USN-9	Connection to the database for maintaining the user details	5	High	Aysha Haslin M
Sprint-4	Containerizing	USN-10	Connection to the database for maintaining the user details	3	High	Mohammed aziz A

6.2 SPRINT DELIVARY SCHEDULE

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date(Planned)	Story Points Complete d (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 CLOUD FEATURES

1. Self-service On-Demand

This is one of the most essential and significant characteristics of cloud computing. This means that cloud computing enables clients to regularly monitor the abilities, allotted network storage, and server uptime. Therefore, it is one of the most fundamental features of cloud computing that helps clients control various computing abilities as per their requirements.

2. Resources Pooling

This is also a fundamental characteristic of cloud computing. Pooling resources means that a cloud service provider can distribute resources for more than one client and provide them with different services according to their needs. Resource Pooling is a multi-client plan useful for data storing, bandwidth services and data processing services. The provider administers the data stored in real-time without conflicting with the client's need for data.

3. Easy Maintenance

This is one of the best cloud characteristics. Cloud servers are easy to maintain with low to almost zero downtime. Cloud Computing powered resources undergo several updates frequently to optimise their capabilities and potential. The updates are more viable with the devices and perform quicker than the previous versions.

4. Economical

This kind of service is economical as it efficiently reduces IT costs and data storage expenditure. Moreover, most cloud computing services are free. Even if there are paid plans, it's only to expand storage capacity. and these costs are often very nominal. This is a massive advantage of using cloud computing services.

5. Rapid Elasticity and Scalability

The best part of using cloud storage is that it can easily handle all the workload and data load concerning storage. Furthermore, as it is fully automated, businesses and organisations can save heavily on manual labour and technical staffing as cloud services are elastic, scalable and automated. This is one of the significant advantages of using cloud services.

API Features:

HTTPS/SSL certificates

Programming cheat sheets

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Bash Shell Scripting Cheat Sheet

eBook: Modernizing Enterprise Java

The gold standard for the web is HTTPS using SSL certificates, and Let's Encrypt can help you achieve this. It is a free, automated, and open certificate authority from the non-profit Internet Security Research Group(ISRG).

2. Cross-origin resource sharing

CORS is a browser-specific security policy preflight check. If your AP server is not in the same domain as the requesting client's domain, you will need to deal with CORS. For example, if your server is running on api.domain-a.com and gets a client request from domain-b.com, CORS sends an HTTP precheck request to see if your API service will accept client-side requests from the client's domain.

3. Authentication and JSON Web Tokens

There are several approaches to validate an authenticated user in your API, but one of the best ways is to use JSON Web Tokens (JWT). These tokens are signed using various types of well-known cryptographic libraries.

When a client logs in, an identity-management service provides the client with a JWT. The client can then use this toren to make requests to the API. The API has access to a public key or a secret that it uses to verity the token.

There are several libraries available to help verify tokens, including jsonwebtoken. For more information about JWT and the libraries that support it in every language, check out JWT.io.

```
import jwt from 'jsonwebtoken'

export default function (reg, res, next) {
    // reg.headers.authorization Bearer token
    const token = extractToken(reg)
    jwt.verify(token, SECRET, { algorithms: ['HS256'] },

(err, decoded) => {
    if (err) { next(err) }
        reg.session = decoded
        next()
    })
}
```

4. Authorizations and scopes

Authentication (or identity verification) is important, but so is authorization, i.e., does the verified client have the privilege to execute this request? This is where scopes are valuable. When the client authenticates with the identity management server and a JWT token is created, having the identity management service provide the scopes for the given authenticated client can enable the API service to determine if this verified client request can be performed without having to perform an additional costly lookup to an access control list.

7.2 FEATURE 2

Docker Features:

1. Faster and Easier configuration:

It is one of the key features of Docker that helps you in configuring the system in a faster and easier manner. Due to this feature, codes can be deployed in less time and with fewer efforts. The infrastructure is not linked with the environment of the application as Docker is used with a wide variety of environments.

2. Application isolation:

Docker provides containers that are used to run applications in an isolated environment. Since each container is independent, Docker can execute any kind of application.

3. Increase in productivity:

It helps in increasing productivity by easing up the technical configuration and rapidly deploying applications. Moreover, it not only provides an isolated environment to execute applications, but it reduces the resources as well.

4. Swarm:

Swarm is a clustering and scheduling tool for Docker containers. At the front end, it uses the Docker API, which helps us to use various tools to control it. It is a self-organizing group of engines that enables pluggable backends.

5. Services:

Services is a list of tasks that specifies the state of a container inside a cluster. Each task in the Services lists one instance of a container that should be running, while Swarm schedules them across the nodes

Kubernetes Features:

- 1. Auto-scaling. Automatically scale containerized applications and their resources up or down based on usage
- 2. Lifecycle management. Automate deployments and updates with the ability to:
- a. Rollback to previous versions
- b. Pause and continue a deployment

- 3. Declarative model. Declare the desired state, and K8s works in the background to maintain that state and recover from any failures.
- 4. Resilience and self-healing. Auto placement, auto restart, auto replication and auto scaling provide application self-healing
- 5. Persistent storage. Ability to mount and add storage dynamically
- 6. Load balancing. Kubernetes supports a variety of internal and external load balancing options to address diverse needs
- 7. DevSecOps support. DevSecOps is an advanced approach to security that simplifies and automates container operations across clouds, integrates security throughout the container lifecycle, and enables teams to deliver secure, high-quality software more quickly. Combining DevSecOps practices and Kubernetes improves developer productivity.

8.TESTING

8.1 TEST CASES

- 1. Verify that after registration users are navigated to login page
- 2. Verify the UI elements in Login/Signup popup
- 3. Verify user is able to log into application with Valid credentials
- 4. Verify that categories of news are shown in homepage
- 5. Verify that news is displayed in homepage
- 6. Verify that when clicked on news it is redirected to correct page

8.2 USER ACCEPTANCE TESTING

Purpose of Document

The purpose of this document is to briefly explain the test coverage and open issues of the Skills/Job Recommender Application project at the time of the release to User Acceptance Testing (UAT).

1.Defect Analysis

This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

Resolution	Severit y1	Severit y2	Severit y3	Severit y4	Subtot al
By Design	10	4	2	3	20
Duplicate	1	0	3	0	4
External	2	3	0	1	6
Fixed	11	2	4	20	37
Not Reproduced	0	0	1	0	1
Skipped	0	0	1	1	2
Won't Fix	0	5	2	1	8
Totals	24	14	13	26	77

2.Test Case Analysis

This report shows the number of test cases that have passed, failed and untested

Section	Total Cases	Not Tested	Fa il	Pas s
Print Engine	7	0	0	7
Client Application	51	0	0	51
Security	2	0	0	2
Outsource	3	0	0	3
Shipping				

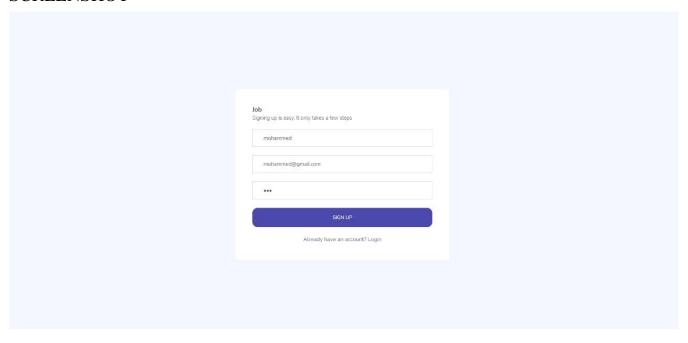
Exception Reporting	9	0	0	9
Final Report Output	4	0	0	4
Version Control	2	0	0	2

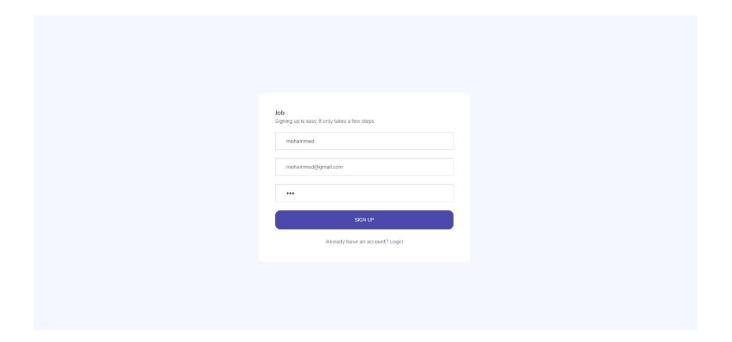
9.RESULT

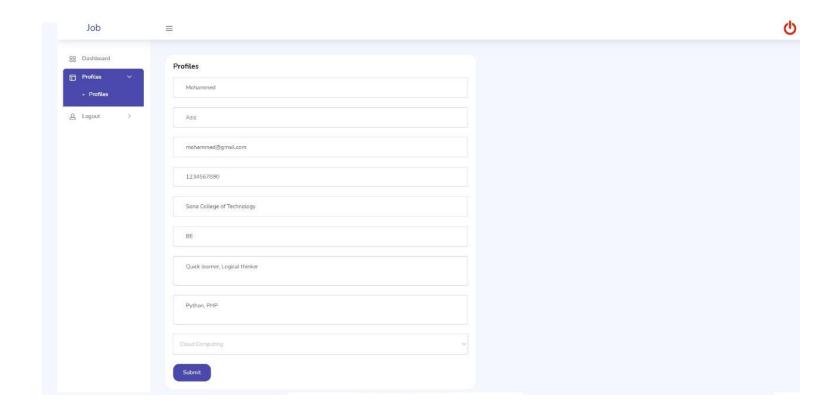
9.1 PERFORMANCE METRICS

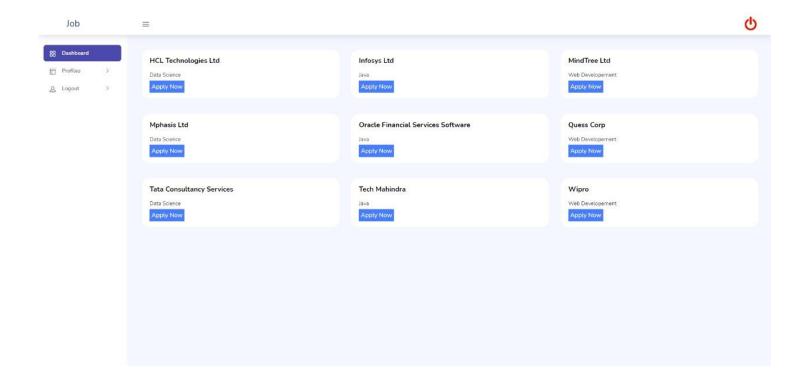
The application performance index, or Apdex score, has become an industry standard for tracking the relative performance of an application. It works by specifying a goal for how long a specific web request or transaction should take. Those transactions are then bucketed into satisfied (fast), tolerating (sluggish), too slow, and failed requests. A simple math formula is then applied to provide a score from 0 to 1.

SCREENSHOT









10.ADVANTAGES AND DISADVANTAGES

Advantages:

1. Employment Opportunities:

The foremost advantage of having a profile in our application is that it is your doorway into employment opportunities worldwide. Before the students would get jobs through advent of online job applications,

connections. However, now your job opportunities have increased magnanimously. Students who have attained education abroad can put in their area of specialization and find an appropriate job. Apart from this, if

there is a particular company that you're interested in, you can make applications for the same.

2. Easy Job Applications:

The traditional recruiting process has taken a back seat and online job application has become paramount. Gone are the days, where you would have to run around with copies of your resume. With the ease of

uploading the necessary information on your profile, not only will the recruiters peruse through your profile but you can update your skills regularly. The initial stress of a job application is reduced because the

recruiter is already aware of your skills and wants to explore them further. This gives you an excellent opportunity to capitalize on the same and use the app to its fullest.

3.Initiate Connections:

Apart from receiving a job offer, the connections you establish on your profile help you in the long run. For instance, you may start by connecting with your school and college friends and eventually shift to your

colleagues. An alumnus from your university is good connections to have. Having an illustrious list of connections speaks to your strong profile. Having a connection who is working at your dream company can

be you r pathway to the same. Initiating connections will allow you to analyse industry trends and be at the top of the game.

4. Endorsement and Connections:

Collecting endorsements and connections is an excellent way of adding social backing to your profile. As mentioned earlier, having illustrious connections will add value to your profile. Upon receiving endorsement for your skills, employers receive extra confidence in your profile. The trick now is to not only have relevant skills but also make your profile stand out.

Disadvantages:

1. Risk of identity theft

There are loads of personal information that you have to display on your profile for prospective employers to see. Hence, in a case whereby LinkedIn servers develop a n issue, you stand a risk of losing important in formation to the public, resulting in identity theft.

2. Incomplete profile challenge

LinkedIn like other social network websites required you top up an at tractive profile. That is a profile that is appealing to employers and prospective recruiters. People however find it hard to fill out profile details completely due to one reason or the other.

3. Tons of spam messages

There's a saying that among 12 disciples there will always be a Judas. Think of how many Judas will be available on a website with over 1200 million people. Linkedin is filled with spam messages from recruiters, employers, and even job seekers. All just to seek attention, mislead, and extort money, etc.

4. Premium package can be expensive

Good thing they say doesn't come cheap. Although, LinkedIn allows you to join the platform without paying. But the LinkedIn premium packages are charged for. For example, the "medium-sized career" price is just about \$29.99/month. There are so many added benefits that this offer brings but can still be very costly for a starter or medium-sized business.

11. CONCLUSION

On the basis of this study and various techniques to research and after implementation of algorithms, the collaborative filtering based algorithm is considered for its better performance and overall factors. Ofcourse a lot of improvement and hybrid algorithms need to be implemented alongside collaborative filtering algorithm. To further optimize the recommendation system, and integrate the system for better performance we keep in check the sparsity of user profile and use some methods for filling user's preference matrix and how it can be utilized.

12. FUTURE SCOPE

There is a lot of room for further research in the topic of employment recommendation systems, including:

- By comparing the results of various similarity measures, we can determine which one provides the most accurate response.
- If we compare the mean absolute inaccuracy of the recommender system's recommendations with actual user preferences, we can draw comparisons.
- For more precise Content Based recommendation, we can take into account a huge number of criteria by assigning them associated weights.
- TF-IDF and Word to Vec with FirstText are two examples of different content-based techniques that can be compared.
- It is possible to create hybrid recommendations by combining methods or by merging the results of collaborative and content-based recommendations.

13. APPENDIX

Source code

Login.html

```
<!DOCTYPE html>
<html lang="en">
             <!-- Required meta tags --> <meta charset="utf-8">
             <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no">
             <title>Job</title>
             <!-- endinject -->
<!-- Plugin css for this page -->
<!-- End plugin css for this page -->
             <!-- inject:css --> k rel="stylesheet" href="css/vertical-layout-light/style.css"> <
             <!-- endinject -->
<link rel="shortcut icon" href="images/favicon.png" />
       <body>
             <div class="container-scroller">

<
                                                          </div>
                                                          <div class="form-group">
     <input type="password" class="form-control form-control-lg" name="password" id="exampleInputPassword1" placeholder="Password" re</pre>
                                                           <div class="mt-3">
     <input type="submit" name="login" class="btn btn-block btn-primary btn-lg font-weight-medium auth-form-btn" value="SIGN UP"/>
                                                           <div class="text-center mt-4 font-weight-light">
                                                                 Already have an account? <a href="index.php" class="text-primary">Login</a>
                          </div>
</div>
<!--
                          <!-- content-wrapper ends -->
                    <!-- page-body-wrapper ends -->
             </div>
<!-- container-scroller -->
<!-- plugins:js -->
<script src="vendors/js/vendor.bundle.base.js"> </script>
              <!-- endinject -->
             <!-- Plugin js for this page -->
<!-- End plugin js for this page -->
             <!-- End plugin js for this page -->
<!-- inject:js -->
<script src="js/off-canvas.js"> </script>
<script src="js/hoverable-collapse.js"> </script>
<script src="js/template.js"> </script>
<script src="js/template.js"> </script>
<script src="js/stctings.js"> </script>
<script src="js/stodolist.js"> </script>
<!-- endinject -->

       </body>
```

header.html

```
<nav class="navbar col-lg-12 col-12 p-0 fixed-top d-flex flex-row">
     </div>
     <div class="navbar-menu-wrapper d-flex align-items-center justify-content-end">
           <button class="navbar-toggler navbar-toggler align-self-center" type="button" data-toggle="minimize">
                <span class="icon-menu"></span>
           </button>
           class="nav-item nav-profile dropdown">
<a class="nav-link dropdown-toggle" href="#" data-toggle="dropdown" id="profileDropdown">
<img src="../images/faces/face28.jpg" alt="profile"/>
                 <div class="dropdown-menu dropdown-menu-right navbar-dropdown" aria-labelledby="profileDropdown">
                 <a class="dropdown-item" href="logout.php">
<i class="ti-power-off text-primary"></i>
                 Logout
                 </a>
                 </div>
                 <button class="navbar-toggler navbar-toggler-right d-lg-none align-self-center" type="button" data-toggle="offcanvas">
                 <span class="icon-menu"></span>
           </button>
</nav>
```

index.html

dashboard.html

```
<?php
session start();
include('config.php');
<!DOCTYPE html>
<html lang="en">
      <head>
            <!-- Required meta tags -->
            <meta charset="utf-8">
            <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no">
            <title>Counseling</title>
            <!-- plugins:css -->
            <link rel="stylesheet" href="../vendors/feather/feather.css">
            <link rel="stylesheet" href="../vendors/ti-icons/css/themify-icons.css">
            <link rel="stylesheet" href="../vendors/css/vendor.bundle.base.css">
            <!-- endinject -->
            <!-- Plugin css for this page -->
            k rel="stylesheet" href="../vendors/datatables.net-bs4/dataTables.bootstrap4.css">
            k rel="stylesheet" href="../vendors/ti-icons/css/themify-icons.css">
            <link rel="stylesheet" type="text/css" href="../js/select.dataTables.min.css">
            <!-- End plugin css for this page -->
            <!-- inject:css -->
            <link rel="stylesheet" href="../css/vertical-layout-light/style.css">
            <!-- endinject -->
            <style type="text/css">
                  #chart-container {
                       width: 600px;
                       height: auto;
            </style>
            <script type="text/javascript" src="../js/jquery.min.js"> </script>
            <script type="text/javascript" src="../js/Chart.min.js"> </script>
      </head>
      <body>
           <div class="container-scroller">
                  <!-- partial:partials/_navbar.html -->
                 <?php
```

```
</div>
</div>
</div>
                                                                                          </div>
                                                                                           </div>
                                                                                            </div>
<div class="col-md-4 grid-margin stretch-card">
                                                                                                                           <!-- partial -->
                                                   </div>
                                                                           </div>
                                                                           <!-- content-wrapper ends -->
                                                                           <!-- partial -->
                                                         </div>
                                                       <!-- main-panel ends -->
                                     </div>
                                     <!-- page-body-wrapper ends -->
                   <!-- container-scroller -->
                  <!-- plugins:js -->

                  <!-- Plugin js for this page -->
<script src="../vendors/chart.js/Chart.min.js"> </script>
<script src="../vendors/datatables.net/jquery.dataTables.js"> </script>
<script src="../vendors/datatables.net-bs4/dataTables.bootstrap4.js"> </script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script
                   <script src="../js/dataTables.select.min.js"> </script>
                   <!-- End plugin js for this page -->
                 <!-- End plugin js for this page -->
<!-- inject:js -->
<script src="../js/off-canvas.js"> </script>
<script src="../js/hoverable-collapse.js"> </script>
<script src="../js/template.js"> </script>
<script src="../js/settings.js"> </script>
<script src="../js/todolist.js"> </script>
<!-- endiniect -->
                   <!-- endinject -->
                  <!-- Custom js for this page-->
<script src="../js/dashboard.js"> </script>
</body>
```

</html>

Job.html

Process.html

apply.html

```
clops
include('dashboard/config.php');
sussion.start();
$_SESSION['esail']*_SPOST['esail'];
$_Session['esail']*_SPOST['esail'],."',".$_POST['esail']."',".$_POST['esail']."')");
$_Session['esail']*_SPOST['esail']."')");
$_Session['esail']*_SPOST['esail']."',".$_POST['esail']."')");
$_Session['esail']*_SPOST['esail']."')");
$_Session['esail']*_SPOST['esail']."')");
$_Session['esail']*_SPOST['esail']."')");
$_Session['esail']*_SPOST['esail']."',".$_POST['esail']."')");
$_Session['esail']*_SPOST['esail']."')");
$_Session['esail']*_Session['esail']."')");
$_Session['esail']*_Session['esail']."'');
$_Session['esail']*_Session['esail']."'');
$_Session['esail']."',".$_POST['esail']."'');
$_Session['esail']."'',".$_POST['esail']."'');
$_Session['esail']."',".$_POST['esail']."'');
$_Session['esail']."',".$_POST['esail']."',".$_Session['esail']."'');
$_Session['esail']."',".$_Session['esail']."'');
$_Session['esail']."',".$_Session['esail']."'');
$_Session['esail']."',".$_Session['esail']."'');
$_Session['esail']."',".$_Session['esail']."'',".$_Session['esail']."'',".$_POST['esail']."'',".$_POST['esail']."'');
$_Session['esail']."',".$_Session['esail']."'',".$_Session['esail']."'',".$_POST['esail']."'',".$_Session['esail']."'',".$_Session['esail']."'',".$_Se
```

Logout.html

```
<?php
session_start();
session_destroy();
header("Location:../index.php");
?>
```

GitHub & Project Demo Link:

Github Link:

https://github.com/IBM-EPBL/IBM-Project-24548-1659944365

Demo Link:

https://youtu.be/OOVYaD4Nj44