A Project Report on

ONLINE JOB SEARCH & RECRUITMENT SYSTEM IN ANDROID ENVIRONMENT USING INTELLIGENT AGENT

A Dissertation submitted to JNTU Hyderabad in partial fulfillment of the academic requirements for the award of the degree.

Bachelor of Technology

In

COMPUTER SCIENCE AND ENGINEERING

Submitted by

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CERTIFICATE

This is to certify that the Major Project report entitled **" ONLINE JOB SEARCH & RECRUITMENT SYSTEM IN ANDROID ENVIRONMENT USING INTELLIGENT AGENT"** being submitted by **K. Yugender (20H51A05H4)** in partial fulfillment for the award of **Bachelor of Technology in COMPUTER SCIENCE AND ENGINEERING** is a record of bonafide workcarried out under my guidance and supervision.

The results embodies in this project report have not been submitted to any other University or Institute for the award of any Degree.

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ABSTRACT

This project aims to identify the issues faced by every job seeker as well as every job recruiter. It has been noted that difficulties arise for both parties: job seekers struggle to find positions that match their experience and skill set, and employers struggle to identify candidates who will fill open positions and fully contribute to the expansion of their organizations. Not only does this application work effectively for large tech organizations, but it also focus and benefits small and large enterprises alike. Many people in society are talented in a variety of professions, but they lack the appropriate audience to demonstrate their abilities and make money from them. Among the abilities are those of a driver, event coordinator, cosmetic artist, barber, and babysitter, among others.

The project aims to provide a platform for both job seekers and recruiters acting as an intermediate between both job seekers and job recruiters by providing an user friendly android application that easy to use and handle the job applications and job postings by both parties and the fuzzy logic used in this application allows user's to perform optimized search and obtain optimized results. The application is developed using Android Studio ,Java ,Firebase cloud messaging ,Android SDK tools.

CHAPTER 1
INTRODUCTION

1.1. Problem Statement

The difficulty of finding a job in today's job market is largely due to the laborious and frequently pointless process of searching online job boards for acceptable positions. Current job search engines often do a poor job of connecting job seekers with employers because they cannot customize recommendations according to each candidate's credentials and preferences. Furthermore, this problem is made worse by the lack of employee feedback, which keeps prospective employees in the dark about the reputation and working conditions of an employer. It is suggested to use an advanced computer program to remedy these flaws. Through direct communication with employers, the use of artificial intelligence and sophisticated algorithms, and the incorporation of employee feedback, this program will enable personalized job matches and offer priceless insights into workplace culture and reputation. The program, which is available on Android phones, will give priority to user-friendliness and accessibility, with the goal of transforming the job search process by enabling people to make knowledgeable career decisions and promoting openness in the employment sector.

This program aims to bridge the gap between employers and job seekers by streamlining the job search process through the use of cutting-edge technology and creative approaches. By means of customized job suggestions and all-encompassing perspectives on workplace dynamics, its objective is to augment the efficacy and efficiency of the job hunt. This program is a critical step in reshaping the future of employment, as it empowers individuals to find meaningful employment opportunities while promoting transparency and accountability within the job market ecosystem.

1.2. Research Objective

The project's research goals include a thorough assessment of how the Online Job Search System can improve the effectiveness of job searches for both employers and candidates. First, a thorough evaluation of the system's performance will be conducted to ascertain how well it streamlines the job search procedure. Secondly, through in-depth investigation, the particular difficulties faced by companies in hiring new employees and by job searchers in finding acceptable jobs in the contemporary job market environment will be recognized and evaluated.

Additionally, the study will examine how digital technologies have changed traditional job search strategies and their applicability in the dynamic labor market of today. Additionally, the Online Job Search System's scalability and adaptability will be assessed, with an emphasis on its capacity to meet the various demands of different industries, from big businesses to small startups. Furthermore, the study intends to examine the ways in which the system resolves typical challenges encountered by employers and job seekers in a range of professions, as well as how it helps people in specialized fields find employment opportunities and market their abilities. By achieving these goals, the study hopes to shed light on the effectiveness and promise of the online
job search system in transforming the job search process and improving the fit between the candidates and openings in the cutthroat job market of today

1.1. Project Scope and Limitation

Scope:

- **Global Accessibility:** Online job search and recruitment systems in an Android environment offer global accessibility, allowing users from different locations to access job listings and apply for positions remotely.
- **Intelligent Matching:** Incorporating intelligent agents can enhance the system's ability to match job seekers with suitable job opportunities based on their skills, qualifications, and preferences.
- **Real-Time Updates:** The system can provide real-time updates on job openings, application statuses, and relevant notifications to both job seekers and recruiters.
- **Efficient Communication:** It facilitates efficient communication between job seekers and recruiters through features like messaging, scheduling interviews, and sharing documents.
- **Data Analytics:** Utilizing data analytics can provide insights into job market trends, candidate preferences, and recruitment patterns, aiding in decision-making and system improvement.

Limitation:

- **Internet Dependency:** The system relies heavily on internet connectivity, which may limit access for users in areas with poor network coverage or limited internet access.
- **Data Security:** Ensuring the security and privacy of user data, including personal information and resume details, is crucial to prevent unauthorized access and data breaches.
- **Skill Matching Accuracy:** While intelligent agents can enhance job matching, there may still be limitations in accurately assessing the compatibility between job seekers and job requirements, leading to potential mismatches.
- **User Interface Complexity:** Designing a user-friendly interface that caters to both job seekers and recruiters while incorporating intelligent agent functionalities can be challenging and may require continuous refinement based on user feedback.
- **System Maintenance:** Regular updates, bug fixes, and maintenance are essential to keep the system running smoothly and to address any technical issues that may arise over time.

CHAPTER 2
BACKGROUND WORK

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BACKGROUND WORK

The realm of online job search and recruitment has witnessed a significant transformation with the advent of technology, particularly within the Android environment. This evolution has been fueled by the integration of intelligent agent systems, revolutionizing how job seekers connect with opportunities and how recruiters identify suitable candidates. In this context, understanding the background work behind an Online Job Search & Recruitment System in an Android environment using intelligent agents becomes paramount. This introduction delves into the foundational aspects, highlighting the technological advancements and strategic considerations that underpin this innovative approach to talent acquisition and job placement.

We started conducting research on various fields, such as academic databases, journals, websites, and books for related studies, and analyzed key theories and frameworks that were used for analyzing the topic. The research papers and journals that we have gone through helped us to understand the overall concept that includes designs ,technologies ,frameworks ,drawbacks of existing systems etc.. that contributed in building this application.

2.1 Job Searching in Old Traditional Methods.

2.1.1 Introduction

In the olden times, the quest for employment followed a vastly different trajectory compared to the modern, technology-driven methods we employ today.[1] Before the advent of the internet and digital platforms, individuals seeking jobs relied on traditional methods that were rooted in physical interactions, printed materials, and local networks. This historical approach to job hunting encompassed a range of practices and rituals that shaped the employment landscape of bygone eras. [2] Exploring the traditional way of finding jobs in olden times provides a fascinating glimpse into the historical evolution of labor markets and recruitment strategies, showcasing the ingenuity and resilience of job seekers and employers in times past.

2.1.2 Demerits, and Challenges

The traditional way of finding jobs in olden times had several notable demerits and challenges that significantly impacted job seekers. Firstly, the limited access to information was a major hurdle. Job vacancies were primarily advertised through local newspapers, bulletin boards, and word-of-mouth, making it difficult for individuals to explore opportunities beyond their immediate vicinity. This geographical constraint often led to missed chances for job seekers who were unaware of potential openings in distant locations or industries. Additionally, the lack of centralized databases or online platforms meant that job seekers had to rely heavily on personal networks and connections, which could be restrictive for those without extensive social or professional contacts.

Secondly, the process of applying for jobs was laborious and time-consuming. Job seekers typically had to physically visit companies or organizations to submit their resumes and credentials, often facing long queues and bureaucratic procedures. This manual approach not only consumed valuable time and resources but also limited the number of job applications an individual could feasibly submit.

Moreover, the lack of standardized application formats and recruitment practices made it challenging for job seekers to showcase their skills and qualifications effectively, leading to potential mismatches between candidates and job requirements. Overall, the traditional way of finding jobs in olden times was fraught with demerits and challenges that hindered efficiency, accessibility, and fairness in the employment process.

2.1.3 Implementation of Traditional Method

Implementing the traditional job search method involves following a series of steps that were commonly used before the digital age.[3] The simplified outline of how this process typically unfolded. Overall, implementing the traditional job search method involved a combination of proactive job hunting, networking, and effective communication skills to navigate the process and secure employment opportunities.

Identification of Job Opportunities: Job seekers would initially identify potential job opportunities through various sources such as local newspapers, community bulletin boards, industry publications, and personal networks. They would actively scan these resources for job listings that matched their skills, experience, and career objectives.

Preparation of Application Materials: Once a suitable job opening was identified, the next step involved preparing application materials. This typically included crafting a resume or curriculum vitae (CV) that highlighted the individual's education, work history, skills, and accomplishments. In some cases, a cover letter explaining the candidate's interest in the position and qualifications might also be required.

Submission of Applications: Job seekers would then physically submit their application materials to the hiring company or organization. This often involved visiting the company's office in person or sending applications through postal mail, along with any required supporting documents such as copies of certificates or letters of recommendation.

Networking and Follow-Up: In parallel with submitting applications, job seekers would engage in networking activities to expand their professional contacts and increase their chances of finding job opportunities. This could involve attending industry events, networking meetings, or reaching out to acquaintances for referrals.

Interviews and Selection: If a job application was successful, the next stage would typically involve one or more rounds of interviews with the hiring company. These interviews could be conducted in-person or over the phone, depending on the circumstances. Following the interviews, the hiring company would evaluate candidates based on their qualifications, experience, and fit for the role before making a hiring decision.

Job Offer and Negotiation: Finally, if a candidate was selected, they would receive a job offer outlining the terms and conditions of employment. Negotiations regarding salary, benefits, and other aspects of the job offer might take place before a final agreement was reached.

2.2 Online Job Searching and Recruitment System-A Career Site

2.2.1 Introduction

As we know that being jobless is very difficult for an educated person and searching for a suitable job is challenging. Since Covid-19 many people have lost their jobs. In this pandemic, this system will work like magic for them to get their preferred job.[4] Newspapers, paper, TV take a lot of money for advertisements while job portals are free of cost.

There is some website that provides an efficient way to search the job vacancies for job seekers. Online job portals have become the standard method for job providers and job seekers to find their respective goals. This project will focus on searching for vacancies, information on jobs available. [5] Nowadays competition is very high, and job providers want to select the right candidate, similarly, job seekers want to choose the right job as their qualification. So this job portal is a place where both requirements can be fulfilled correctly.

2.2.2 Merits

There are many apps and research papers on this topic, but we include some extra functionality on it like, including a book store where all type of book is available for reading so that some people can use this web for the book, a section is provided where job seekers can see the syllabus of particular post or job.

Global Reach: The online job search and recruitment system developed in Python-Django can reach a global audience, allowing job seekers and recruiters from different geographical locations to connect and interact seamlessly.

Efficiency and Automation: Python-Django's robust framework enables automation of various tasks such as job posting, resume parsing, candidate screening, and scheduling interviews, leading to increased efficiency and reduced manual effort in the recruitment process.

Data Analytics and Insights: The system can leverage Python's data analytics capabilities to analyze job market trends, track applicant metrics, and generate valuable insights for recruiters, aiding in strategic decision-making and talent acquisition strategies.

Scalability and Customization: Python-Django's scalability and flexibility allow the job search system to handle a large volume of users and job listings while offering customization options to tailor the user experience, search algorithms, and matching criteria based on specific industry requirements.

2.2.3 Demerits, and Challenges

Cybersecurity Risks: Online job search and recruitment systems developed in Python are susceptible to cybersecurity threats such as data breaches, phishing attacks, and malware infiltration, necessitating robust security measures to safeguard sensitive user information and prevent unauthorized access.

Technical Complexity: Developing and maintaining a Python-based web application for job search and recruitment requires specialized technical expertise, which can be challenging to acquire and retain, particularly for smaller organizations or startups with limited resources.

Data Privacy Concerns: The collection, storage, and processing of personal data within the online job search system raise privacy concerns, especially with regard to compliance with data protection regulations such as GDPR or CCPA, requiring strict adherence to privacy policies and consent mechanisms.

User Experience Challenges: Ensuring a seamless and intuitive user experience across devices and browsers can be a challenge in Python-based web development, requiring continuous optimization and testing to address usability issues and accessibility barriers for diverse user demographics.

Integration and Compatibility: Integrating the job search system with external APIs, databases, and third-party services may pose compatibility challenges and require ongoing maintenance and updates to ensure seamless functionality and data synchronization.

2.2.4 Implementation of Online Job Searching and Recruitment System-A Career Site

To develop this project we are using WISDM(Web information systems Development Methodology) which is an ISD method developed by David Avison, Bob Wood, Richard Vidgen, and Trevor Wood-Harper (Vidgen 2002). This method is a traditional method of web development.

The main framework of this method is to extract from multi-tier. WISDM mainly focused on the method matrix which is divided into two dimensions: Socio, technical: analysis, design

2.2.4.1 ADMINISTRATOR

1. Admin manages the system.
2. Admin can delete/update/activate and deactivate job seekers or recruiter's information.
3. Admin can watch job seeker's applications for each posted job.
4. Admin can activate/deactivate/delete/edit posted jobs.
5. Administrators can send messages to any job seeker or recruiter.
6. They can add a new job seeker or recruiter.
7. He can change the pending status of recruiters.
8. Admin manages the database.

2.2.4.2 JOB SEEKERS

1. This system is developed to help job seekers.
2. Job seekers can register themselves using a name, email, contact number, etc.
3. They can select skills according to their qualification.
4. Job seekers can search for the desired job.
5. Job seekers can make their résumé using the résumé maker on the website.

6. He/she can ask questions about the job or interview process to the company.
7. Job seekers can add or update profile details.

2.2.4.3 RECRUITER'S

1.Recruiters can register themselves using email-id, mobile number, etc.
2. Job providers can add/update the profile of a company.
3. Recruiter can post new vacancies.
4. He can see and filter all applications of job seekers.
5. Recruiter can see and download resumes of job seekers.
6. Recruiter can send messages to any job seekers.

This system is created using Python, Django framework, HTML, CSS, JavaScript. We also included the news section, book section, syllabus for the interview, etc.

2.3 Job Search System - Application of Intelligent Agents

2.3.1 Introduction

In today's global economy, the challenges associated with finding a suitable job is amplified by the technicalities as sociated with the Job search process which is seen by ex perience. [6] Normally when we want to apply for a job, we search the newspapers; listen to radio and television broadcasts that may advertise vacancies and also job seekers register themselves with job site portals such as Academickeys.com, Monster.com, and Careerbuilder.com and so on. In general, employers do not register them selves with these mediums to provide full details of the job specifications but instead post important details on their own website only. [7] Also with the growing number of online job search engines, making it almost impossible for job seekers to get an overview of all relevant positions . Therefore we do not always get to know all the vacancies, the nature and status of the employer to decide if this is the sort of job that is being sought for.

Also at times we get flattered by the job providers profile but don't get information about the rating of the company by the existing or past employee in terms of salary and so. Taking all these into consideration we propose to develop an intelligent agent (instead of a human agent) to perform the same search operations by interacting with the employer and job search coordinator agents. [8]We propose to use an agent based utility concept to provide suitability profiling based on configurable factors such as distance from work, days and shift requirements, work environment, safety and hazard considerations, remuneration, skill-set, etc.

2.3.2 Merits

Mobile Accessibility: Job search systems in the Android environment offer convenient access on mobile devices, allowing users to search for jobs, apply, and manage applications anytime, anywhere.

Integration with Device Features: Android job search apps can leverage device features like GPS for location-based job recommendations, notifications for real-time updates on job status, and camera for document uploads, enhancing user experience and functionality.

Customization and Personalization: Android job search systems can be customized with user preferences, job alerts, and personalized recommendations, providing a tailored experience that matches individual skills and interests.

Offline Functionality: Some Android job search apps offer offline functionality, allowing users to browse saved job listings, draft applications, and update profiles even without an active internet connection, improving accessibility in areas with limited connectivity.

Community and Networking: Android job search platforms often include social features such as networking groups, forums, and chat functionalities, fostering community engagement, knowledge sharing, and networking opportunities among job seekers and professionals.

2.3.3 Demerits, and Challenges

Device Fragmentation: Job search systems in the Android environment face challenges due to the wide range of devices with varying screen sizes, resolutions, and hardware specifications, necessitating thorough testing and optimization for diverse user experiences.

Data Security Concerns: Storing and transmitting sensitive user data within job search apps on Android devices raises concerns about data privacy and security breaches, necessitating robust encryption methods, secure authentication mechanisms, and compliance with data protection regulations.

Performance Optimization: Ensuring smooth performance and responsiveness of job search apps across different Android versions and devices requires continuous optimization, efficient resource management, and addressing potential memory leaks and performance bottlenecks.

Platform Fragmentation: The Android ecosystem's fragmentation, with multiple OS versions, device manufacturers, and customizations, poses challenges for app compatibility, updates, and feature integration, requiring thorough testing and adaptation to ensure consistent functionality and user experience.

2.3.4 Implementation of Job Search System - Application of Intelligent Agents

Purpose of the System: Job Search System is developed to provide an effective means for the employers to post job openings with required qualification to have a better penetration into the job market and jobseekers to find out the information regarding the current openings in the organization or in the market. [9]In addition, job seekers can view the reviews provided by the applicants to make necessary improvements in their system if needed. Job search System is an android application providing flexibility for the users.

Proposed System: Job Search System is a Java-based an droid application that provides functionalities of e recruitment on portable devices like Android based smart phones/tablets. The applications do not require internet to perform the desired functionalities. Advantages: Cost and Time efficient, Portable.

Job Search Algorithm: Job-search theory attempts to pro pose strategies for making optimal employment decisions by considering factors that determine individual's demands and their prospect for finding an acceptable job offers.
The variables to be considered are: Industry, Occupation, Education, Job Type (Full-time, part-time, contract, etc.), Career Level (amount of experience obtained versus what is required for the job),Salary and Allowances (salary and all additional benefits).

Database: The database that is used to design the application is Fire base. Firebase Realtime database is a cloud hosted data base that supports multiple platforms Android, iOS and Web. All the data is stored in JSON format and any changes in data, reflects immediately by performing a sync across all the platforms & devices. This allows us to build more flexible realtime apps easily with minimal effort. Here, we have identified five tables to achieve desired functionality.

CHAPTER 3
PROPOSED SYSTEM

CHAPTER 3

PROPOSED SYSTEM

1.1. Objective of Proposed System

The proposed system emphasizes the need to address existing anomalies through comprehensive computerization. This involves automating a variety of tasks in order to improve efficiency, accuracy, and overall effectiveness. An android application is being developed using Android Studio and the programming language JAVA to serve as the primary interface for users and recruiters. Android Studio is a powerful development environment that includes all of the tools and libraries you'll need to create feature-rich Android applications. The use of Java provides flexibility, scalability, and compatibility, ensuring that the application meets the diverse needs of users and recruiters across multiple devices and operating systems.

In the proposed system, users and recruiters are two key entities that access the Android application. Users use the platform to look for job opportunities, submit applications, and manage their profiles, while recruiters use it to post job openings, review candidate profiles, and streamline the recruitment process. This distinction in user roles emphasizes the importance of providing a user-friendly interface that caters to each group's specific needs and preferences. The android application's thoughtful design and intuitive navigation aim to provide a seamless and engaging experience for both users and recruiters, fostering efficient interaction and collaboration within the recruitment ecosystem.

Furthermore, the system includes an authentication mechanism for administrators to ensure secure access and effective application management. Before accessing administrative functionalities, administrators must authenticate themselves using valid login credentials. This authentication layer provides additional security by protecting sensitive data and system configurations from unauthorized access or manipulation. Administrators oversee system operations, manage user accounts, and enforce security policies, ensuring the system integrity.

Users and recruiters gain access to their respective modules within the Android application after logging in successfully. Each module is intended to streamline tasks and processes specific to their roles, allowing users and recruiters to perform their duties more accurately and efficiently. The system provides a comprehensive suite of features tailored to the diverse needs of users and recruiters, including job searching, application submission, job posting, and candidate management. The android application aims to improve recruitment processes, increase user satisfaction, and drive overall productivity in the recruitment ecosystem by providing stakeholders with intuitive tools and functionalities.

3.2 Implementation of Proposed Model

The implementation of Online job search and recruitment system in android environment using intelligent agent is to provide a platform for both job seekers and recruiters acting as an intermediate between both job seekers and job recruiters by providing an user friendly android application that easy to use and handle the job applications and job postings by both parties and the fuzzy logic used in this application allows users to perform optimized search and obtain optimized results. The application is developed using Android Studio -Java ,Firebase cloud messaging ,Android SDK tools.

The Project application is loaded in Android Studio. We used Android Studio for Design and coding of project. Created and maintained all databases into Firebase cloud messaging, in that we create tables, write query for store data or record of project.

3.3 Designing

The system comprises of two major modules with their sub-modules as follows:

User

- **Registration:**
  The User or jobseeker can create their account after adding all their details
- **Login:**
  The User can log in to their account.
- **Profile:**
  - **Personal**: The user can fill in their personal details.
  - **Work Experience**: User can fill in details about their prior work experience
  - **Key Skills:** The jobseeker can add any special skillsets they possess.
  - **Upload CV:** The user can upload their CV
  - **Change password:** User can change the password to their account.
- **Home:**
  - **Search job/ Jobs for you:** The candidate will be shown jobs that best suit their skillset and qualifications
  - **Job details:** The applicant can view further details about the jobs shown to them.
  - **Apply:** The jobseeker can apply for jobs that they find to be promising.
- **Applied:**
  - **View all the previous jobs you have applied:** The user can view all the jobs that they have applied for.
  - **Chat with the recruiter for the jobs applied:** The candidate can co-ordinate and follow up with the recruiter regarding the job.
- **Chats:**
  - **Recent Chats:** The user can view their most recent chats
  - **Chat Page:** The user will be shown their chats.
- **Notifications**
  - **Chat Notifications:** chats/candidates applied for job

Use Case Diagram:

USE CASE DIAGRAM:

A use case diagram in the Unified Modeling Language (UML) is a type of behavioral diagram defined by and created from a Use-case analysis. Its purpose is to present a graphical overview UML stands for Unified Modeling Language. UML is a standardized general-purpose modeling language in the field of of the functionality provided by a system in terms of actors, their goals (represented as use cases), and any dependencies between those use cases. The main purpose of a use case diagram is to show what system functions are performed for which actor. Roles of the actors in the system can be depicted.

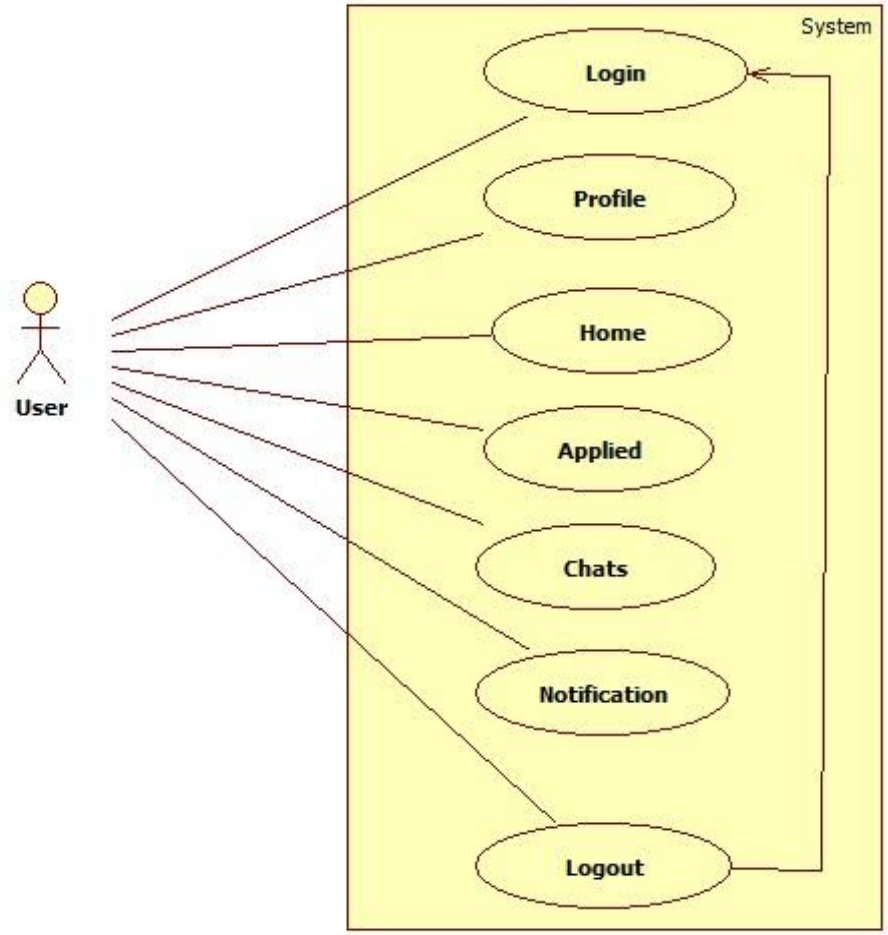

Fig 3.3.1 : User's Use Case

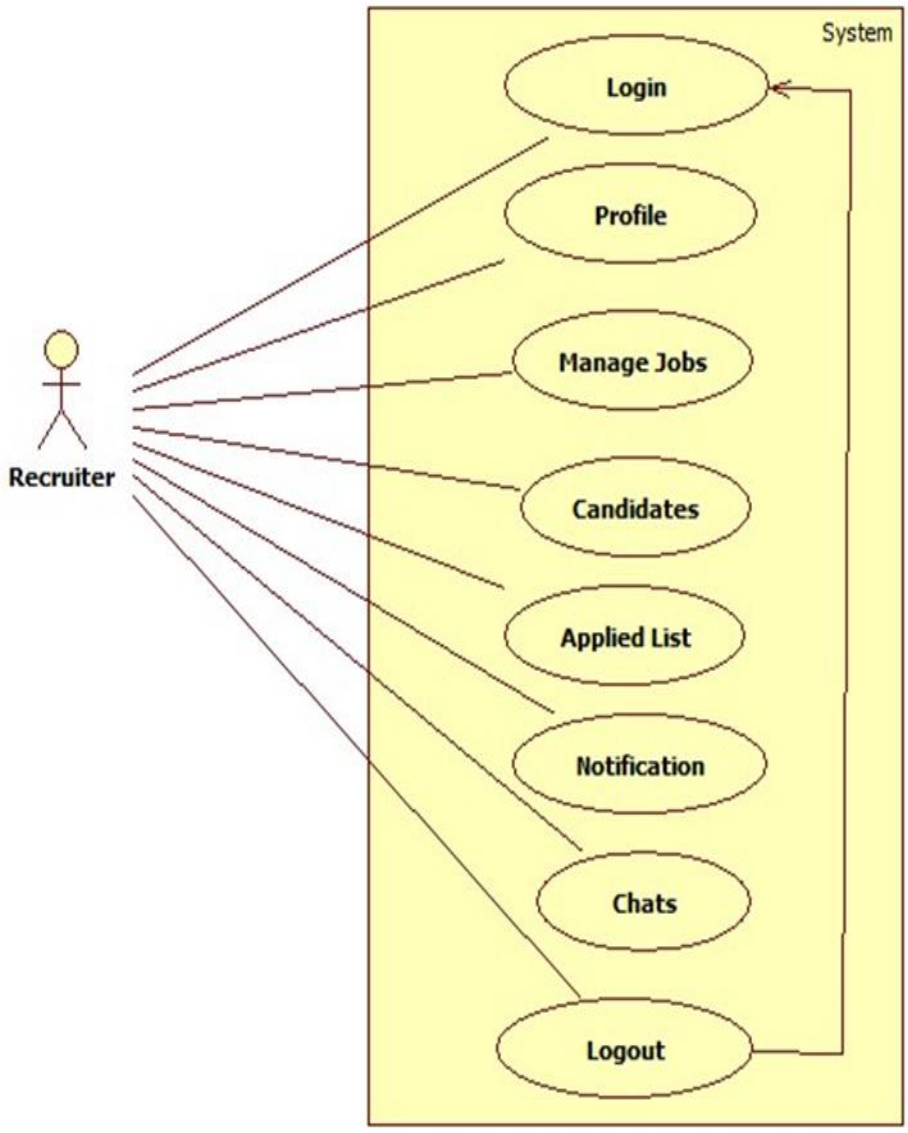

Fig 3.3.2: Recruiter Use Case

Recruiter

- **Registration:** The recruiter can create their account and register themselves.
- **Login:** The recruiter can log in to their account with their credentials.
- **Profile**:
  - **Profile/Change password:** The recruiter can view their profile or change their password.
- **Manage Jobs**
  - **Add/update/view/delete jobs:** The recruiter can add, update, view or delete jobs depending on the vacancies.
  - **Job details:** The recruiter can add details about the available vacancies.
  - **Company Details:** The recruiter can add info about the company.
  - **View Candidates:** Depending on the parameters, the recruiter will be shown a list of suitable candidates with details such as their experience, skills, salary, notice period etc.
  - **Chat With Candidates:** The recruiters can chat with prospective candidates.
- **Candidates**
  - **Search Candidates**: The recruiter can manually search for candidates.
  - **Experience/skills/salary/notice:** The recruiter can refine their search using parameters such as prior experience, skill set, salary expectations, notice period.
  - **Chat With Candidates:** The recruiter can chat with candidates that they find promising.
- **Applied List**
  - **List Of All Candidates That Applied & Their Details:** Recruiters can view details about the candidates that have applied for the vacancy.
  - **Chat With Candidates:** The recruiter can chat with the candidates that have applied.
- **Chats**
  - **Chat List:** The recruiter can view a list of all their chats.
    Chat Page: The recruiter can view all previous chats.
- **Notifications -** chats/candidates applied for job

ACTIVITY DIAGRAM:

Activity diagram is another important diagram in UML to describe dynamic aspects of the system. It is basically a flow chart to represent the flow form one activity to another activity. The activity can be described as an operation of the system. So the control flow is drawn from one operation to another. This flow can be sequential, branched or concurrent

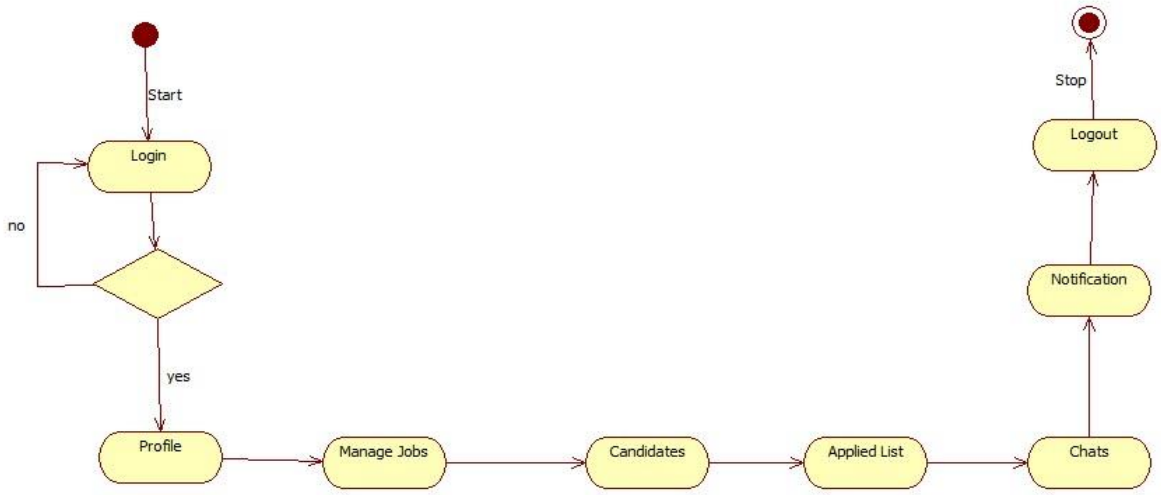

Fig 3.3.3 : Recruiter's Activity

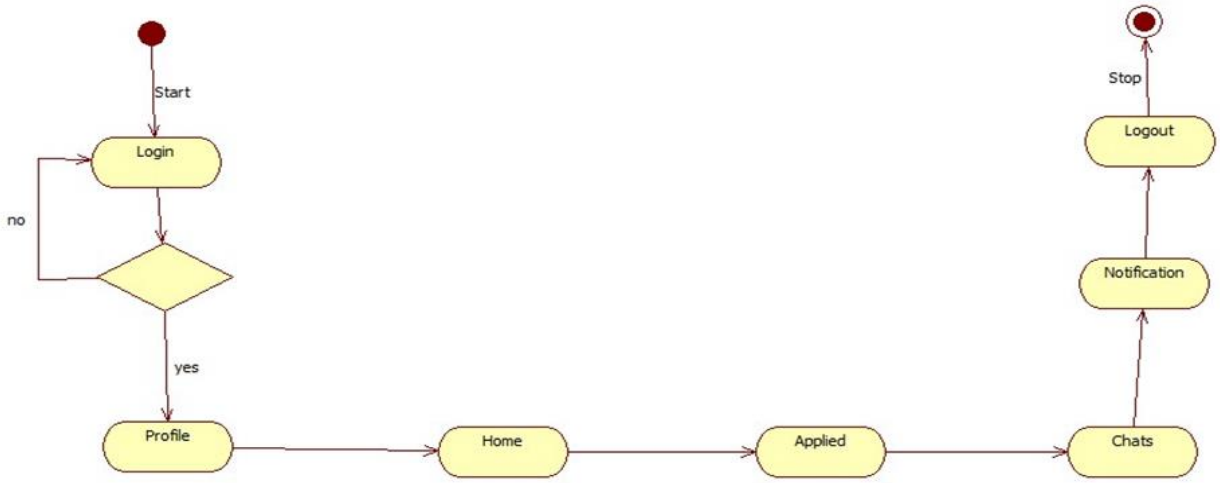

Fig 3.3.4 : User's Activity

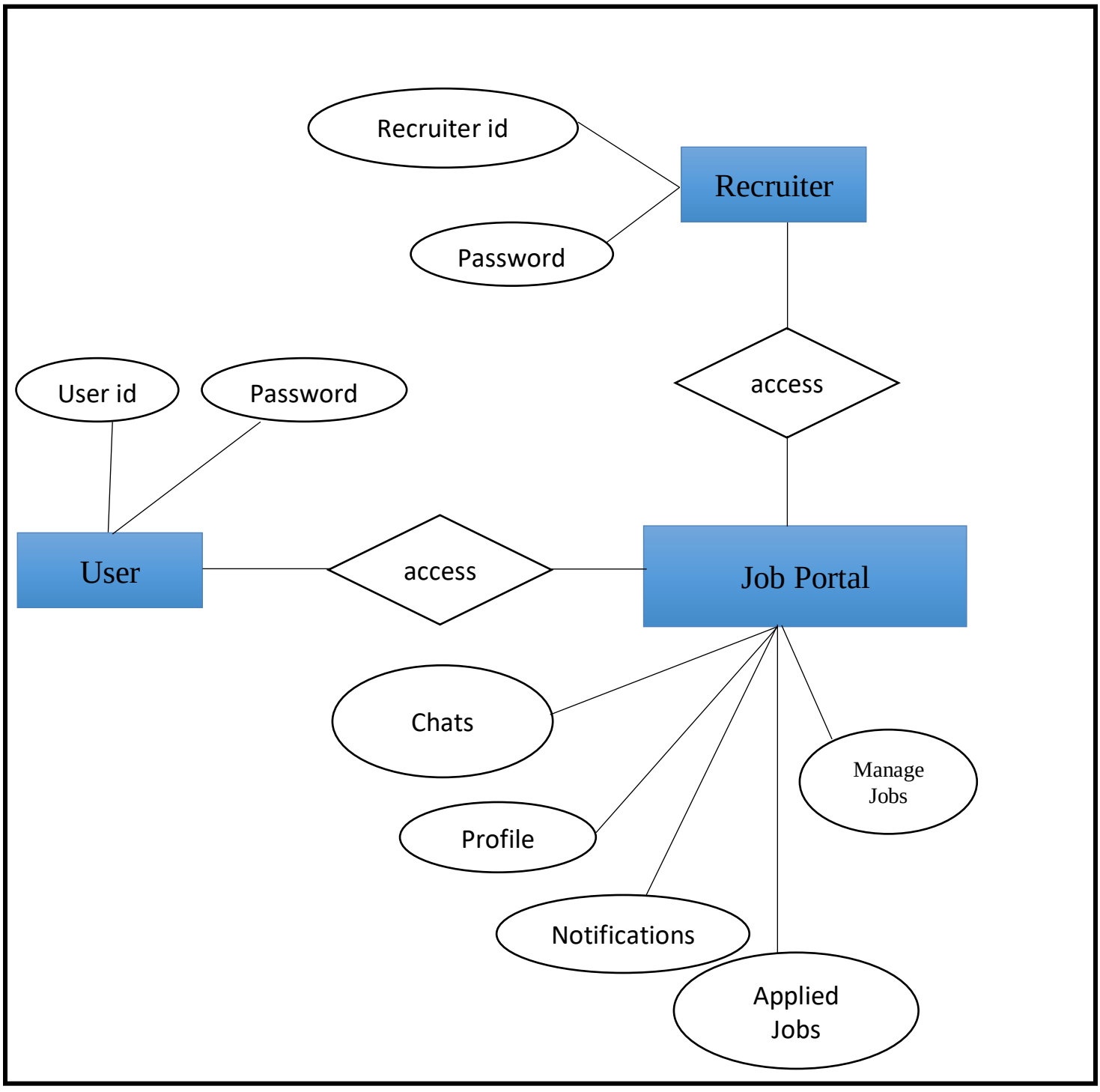

Fig 3.3.5 : ER Diagram

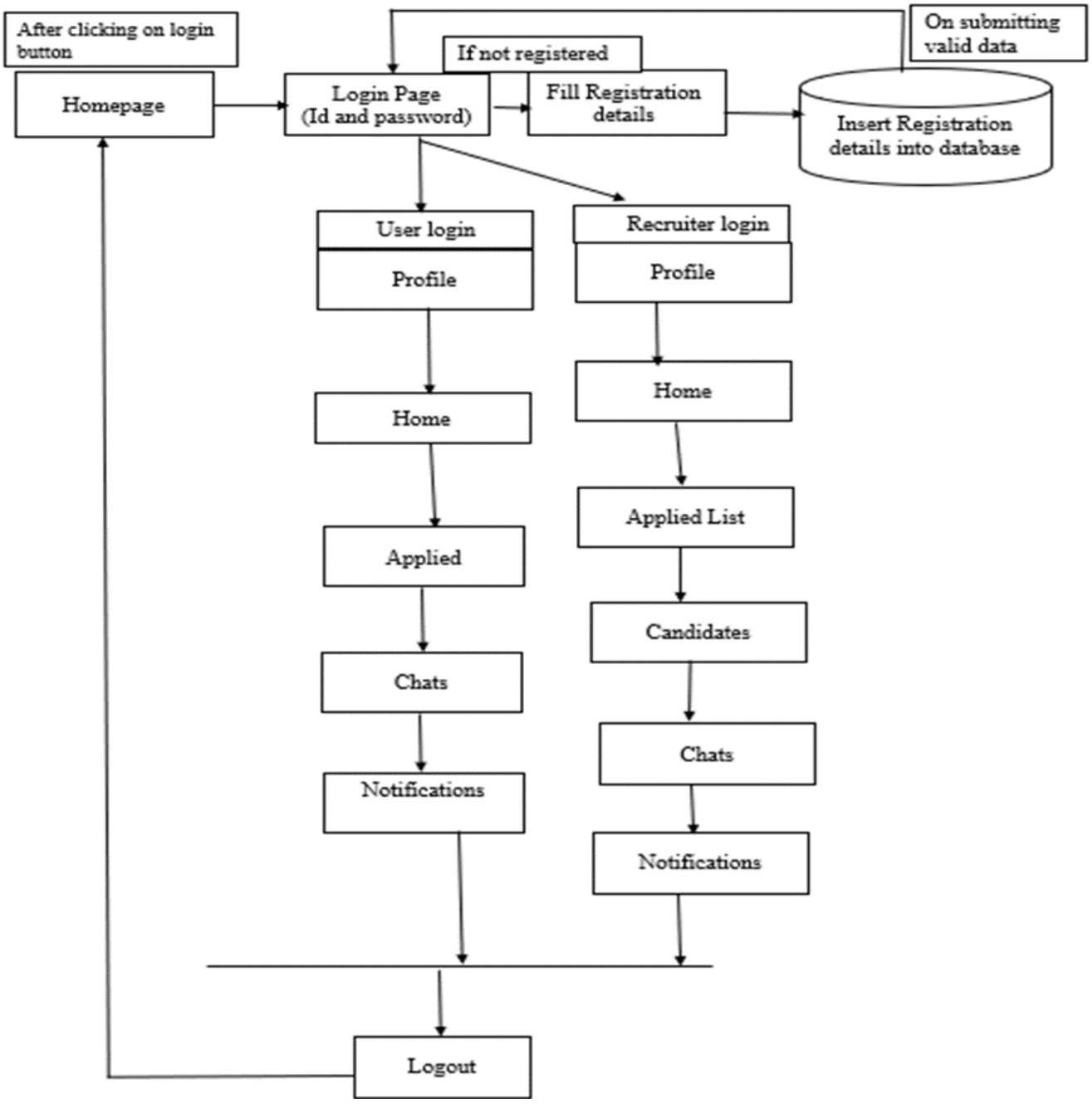

Fig 3.3.6 : System Architecture

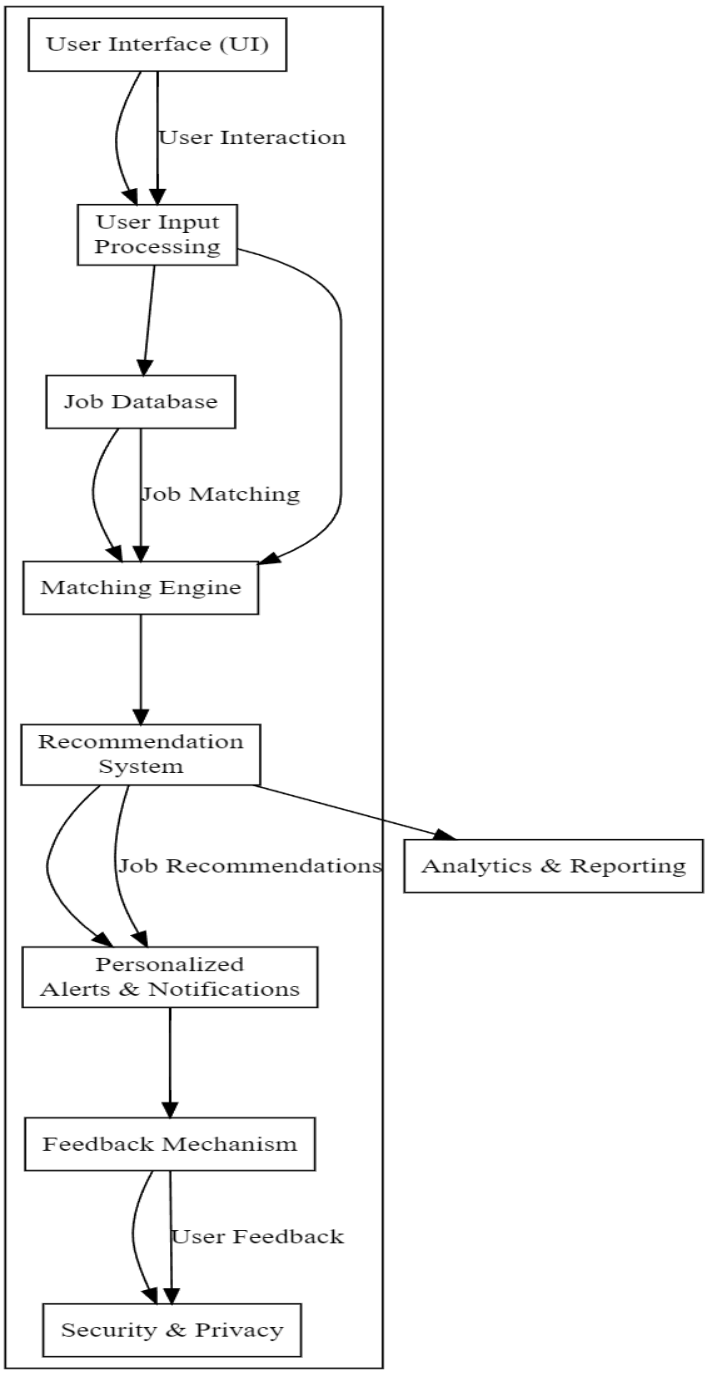

Fig 3.3.7 : Flow Diagram

3.4 Stepwise Implementation and Code

The application of an Online Job Search & Recruitment System in an Android environment, enhanced by intelligent agent technology, marks a significant advancement in modern employment strategies. Developed utilizing Android Studio and programmed in Java, this innovative system incorporates fuzzy logic algorithms for nuanced decision-making and employs Firebase as the database backend, ensuring seamless data management and real-time updates. This text delves into the functionalities and benefits of this cutting-edge solution, highlighting its potential to revolutionize the job search and recruitment landscape.

Fuzzy logic is a mathematical framework that allows for reasoning under uncertainty by using degrees of truth rather than strict binary values. Unlike traditional Boolean logic, which uses sharp, precise distinctions between true and false, fuzzy logic recognizes and accepts ambiguity and imprecision in data or problem domains. This is accomplished through the use of fuzzy sets, which assign degrees of membership to elements based on their closeness or similarity to linguistic terms, allowing for a more nuanced representation of uncertainty.

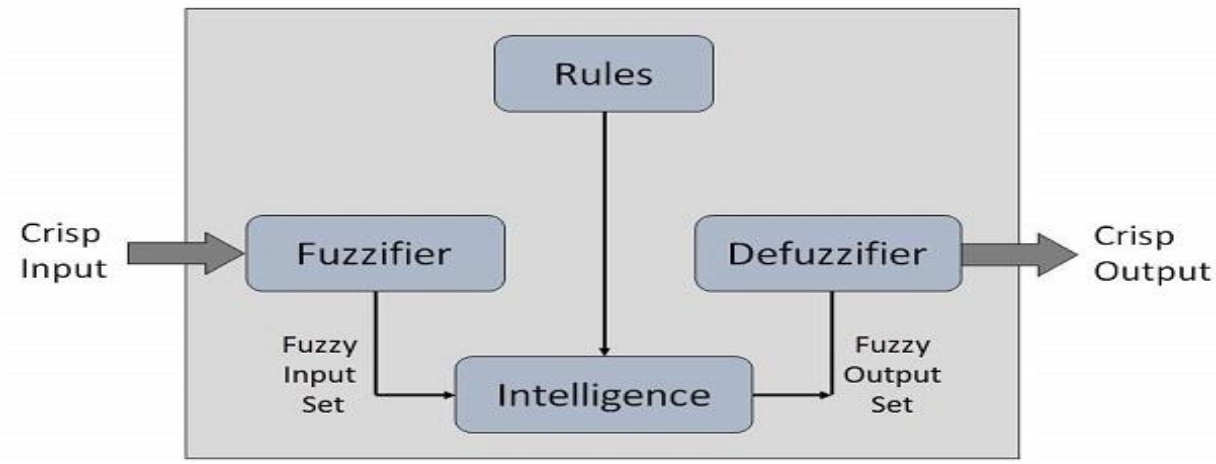

Fig 3.4.1 Fuzzy Logic

Membership functions are at the heart of fuzzy logic; they define the degree to which elements belong to fuzzy sets. These functions are critical in quantifying the extent of membership in linguistic terms like "very likely" or "somewhat true," allowing fuzzy reasoning to capture the inherent ambiguity found in many real-world scenarios. Fuzzy logic, which includes operations like fuzzy AND, fuzzy OR, and fuzzy NOT, allows for the manipulation of uncertain or imprecise information, facilitating decision-making and inference in complex systems where traditional binary logic fails.

Fuzzy logic has applications in a variety of domains, including control systems, pattern recognition, and decision support systems, where handling uncertainty and imprecision is critical. Fuzzy logic, by providing a flexible and intuitive framework for reasoning under uncertainty, allows for the development of intelligent systems that can mimic human-like reasoning processes, making it a valuable tool in fields where precise, deterministic approaches are not feasible or desirable

Fuzzy logic extends traditional binary logic by allowing uncertainty to be represented as degrees of truth. This is especially useful in situations where making precise, deterministic decisions is difficult due to data ambiguity or imprecision. Fuzzy logic allows for more nuanced reasoning and decision-making processes by quantifying uncertainty using membership degrees.

Project Code:

Main Activity:

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.jobportal">
    <uses-permission android:name="android.permission.INTERNET" />
    <uses-permission android:name="android.permission.READ_EXTERNAL_STORAGE" />
    <uses-permission android:name="android.permission.WRITE_EXTERNAL_STORAGE" />
    <uses-permission android:name="android.permission.FOREGROUND_SERVICE" />
    <uses-permission android:name="android.permission.RECEIVE_BOOT_COMPLETED" />
    <application
        android:allowBackup="true"
        android:icon="@drawable/logo_64px"
        android:label="@string/app_name"
        android:requestLegacyExternalStorage="true"
        android:roundIcon="@drawable/logo_64px"
        android:supportsRtl="true"
        android:theme="@style/Theme.JobPortal"
        android:usesCleartextTraffic="true">
        <activity
            android:name=".activity.RecentChatsActivity"
            android:exported="true" />
        <activity
            android:name=".activity.ChatsActivity"
            android:exported="true" />
        <activity
            android:name=".activity.user.ViewJobDetailsOrApplyActivity"
            android:exported="true" />
        <activity
            android:name=".activity.recruiter.AddJobPositionActivity"
            android:exported="true" />
        <activity
            android:name=".activity.user.ApplicationTabsActivity"
            android:exported="true" />
        <activity
            android:name=".activity.user.SearchJobActivity"
            android:exported="true" />
        <activity
            android:name=".activity.user.UserDetailsActivity"
            android:exported="true" />
        <activity
            android:name=".activity.ProfileActivity"
            android:exported="true" />
```

```
 <activity
    android:name=".activity.recruiter.ManageCandidatesActivity"
    android:exported="true"
<activity
    android:name=".activity.recruiter.AddCompanyActivity"
    android:exported="true" />
<activity
    android:name=".activity.recruiter.AddJobDetailsActivity"
    android:exported="true" />
<activity
    android:name=".activity.recruiter.ManageCompanyActivity"
    android:exported="true" />
<activity
    android:name=".activity.recruiter.ManageJobsActivity"
    android:exported="true" />
<activity
    android:name=".activity.recruiter.RecruiterDashboardActivity"
    android:exported="true" />
<activity
    android:name=".activity.user.AddUserDetailsActivity"
    android:exported="true" />
<activity
    android:name=".activity.user.DashboardActivity"
    android:exported="true" />
<activity
    android:name=".activity.RegistrationActivity"
    android:exported="true" />
<activity
    android:name=".activity.recruiter.AddJobsActivity"
    android:exported="true" />
<activity
    android:name=".activity.LoginActivity"
    android:exported="true" />
<activity
    android:name=".activity.MainActivity"
    android:exported="true">
    <intent-filter>
        <action android:name="android.intent.action.MAIN" />

        <category android:name="android.intent.category.LAUNCHER" />
    </intent-filter>
</activity>
<provider
    android:name="androidx.core.content.FileProvider"
    android:authorities="${applicationId}.fileprovider"
    android:exported="false"
    android:grantUriPermissions="true">
    <meta-data
```

```
            android:name="android.support.FILE_PROVIDER_PATHS"
            android:resource="@xml/provider_paths" />
        </provider>

        <uses-library
            android:name="org.apache.http.legacy"
            android:required="false" />

        <receiver
            android:name=".utility.BootCompletedBReceiver"
            android:enabled="true"
            android:exported="true">
            <intent-filter>
                <action android:name="android.intent.action.BOOT_COMPLETED" />
            </intent-filter>
        </receiver>

        <service android:name=".utility.MyNotificationService" />
    </application>

</manifest>
```

Recruiter Activity:

```
package com.example.jobportal.activity.recruiter;
import androidx.appcompat.app.AlertDialog;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.content.ContextCompat;
import android.annotation.SuppressLint;
import android.content.Intent;
import android.graphics.Color;
import android.os.Build;
import android.os.Bundle;
import android.view.View;
import android.view.ViewGroup;
import android.view.Window;
import android.view.WindowManager;
import android.widget.Button;
import android.widget.LinearLayout;
import android.widget.Toast;
import com.example.jobportal.R;
import com.example.jobportal.activity.LoginActivity;
import com.example.jobportal.activity.MainActivity;
import com.example.jobportal.activity.ProfileActivity;
import com.example.jobportal.activity.user.DashboardActivity;
import com.example.jobportal.utility.BackgroundNotificationService;
import com.example.jobportal.utility.Helper;
import com.example.jobportal.utility.MyNotificationService;
```

```
import com.example.jobportal.utility.UserPref;

public class RecruiterDashboardActivity extends AppCompatActivity implements
View.OnClickListener {
   private AlertDialog alertDialog;

   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_recruiter_dashboard);

      if (Build.VERSION.SDK_INT >= Build.VERSION_CODES.LOLLIPOP) {
         Window window = getWindow();
         window.addFlags(WindowManager.LayoutParams.FLAG_DRAWS_SYSTEM_BAR
_BACKGROUNDS);
         window.setStatusBarColor(Color.WHITE);
      }
      if (!Helper.isMyServiceRunning(this)) {
         Intent serviceIntent = new Intent(this, MyNotificationService.class);
         ContextCompat.startForegroundService(this, serviceIntent);
      }
      initUI();

   }
   private void initUI() {
      LinearLayout llJobsLayout = findViewById(R.id.llJobsLayout);
      LinearLayout llCandidateListLayout = findViewById(R.id.llCandidateListLayout);
      LinearLayout llProfileLayout = findViewById(R.id.llProfileLayout);
      LinearLayout llLogoutLayout = findViewById(R.id.llLogoutLayout);

      llJobsLayout.setOnClickListener(this);
      llCandidateListLayout.setOnClickListener(this);
      llProfileLayout.setOnClickListener(this);
     llLogoutLayout.setOnClickListener(this);
   }
   @SuppressLint("NonConstantResourceId")
   @Override
   public void onClick(View view) {
      switch (view.getId()) {
         case R.id.llJobsLayout:
            Helper.goTo(this, ManageCompanyActivity.class);
            break;
         case R.id.llCandidateListLayout:
            Helper.goTo(this, ManageCandidatesActivity.class);
            break;
         case R.id.llProfileLayout:
```

```
Helper.goTo(this, ProfileActivity.class);
            break;
         case R.id.llLogoutLayout:
            logout();
            break;
         case R.id.alertBtnLogout:
            alertButtonLogoutClick();
            break;



case R.id.alertBtnBack:
            alertDialog.dismiss();
      }
   }
   private void logout() {

      View alertView = getLayoutInflater().inflate(R.layout.alert_logout_confirmation, null);

      Button alertBtnBack = alertView.findViewById(R.id.alertBtnBack);
      Button alertBtnLogout = alertView.findViewById(R.id.alertBtnLogout);

      alertBtnBack.setOnClickListener(this);
      alertBtnLogout.setOnClickListener(this);

      AlertDialog.Builder alert = new AlertDialog.Builder(this);
      if (alertView.getParent() != null) {
         ((ViewGroup) alertView.getParent()).removeView(alertView);
      }
      alert.setView(alertView);
      alertDialog = alert.show();
   }

   private void alertButtonLogoutClick() {
      UserPref.setLoginStatus(this, false);
      UserPref.deleteAll(this);
      if (Helper.isMyServiceRunning(this)) {
         Intent serviceNotification = new Intent(this, MyNotificationService.class);
         stopService(serviceNotification);
      }
      int flags = Intent.FLAG_ACTIVITY_CLEAR_TOP | Intent.FLAG_ACTIVITY_CLEAR_TASK |
Intent.FLAG_ACTIVITY_NEW_TASK;
      Helper.goToWithFlags(this, MainActivity.class, flags);
      finish();
   }
}
```

```
private void initUI() {
      LinearLayout llJobsLayout = findViewById(R.id.llJobsLayout);
      LinearLayout llCandidateListLayout = findViewById(R.id.llCandidateListLayout);
      LinearLayout llProfileLayout = findViewById(R.id.llProfileLayout);
      LinearLayout llLogoutLayout = findViewById(R.id.llLogoutLayout);

      llJobsLayout.setOnClickListener(this);
      llCandidateListLayout.setOnClickListener(this);
      llProfileLayout.setOnClickListener(this);
      llLogoutLayout.setOnClickListener(this);

   }

   @SuppressLint("NonConstantResourceId")
   @Override
   public void onClick(View view) {
      switch (view.getId()) {
         case R.id.llJobsLayout:
            Helper.goTo(this, ManageCompanyActivity.class);
            break;
         case R.id.llCandidateListLayout:
            Helper.goTo(this, ManageCandidatesActivity.class);
            break;
         case R.id.llProfileLayout:
            Helper.goTo(this, ProfileActivity.class);
            break;
         case R.id.llLogoutLayout:
            logout();
            break;
         case R.id.alertBtnLogout:
            alertButtonLogoutClick();
            break;
         case R.id.alertBtnBack:
            alertDialog.dismiss();
      }
   }
```

User Activity:

```
package com.example.jobportal.activity.user;
import androidx.appcompat.app.AppCompatActivity;
import android.annotation.SuppressLint;
import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.LinearLayout;

import com.example.jobportal.R;
import com.example.jobportal.activity.recruiter.RecruiterDashboardActivity;
import com.example.jobportal.activity.user.DashboardActivity;
import com.example.jobportal.utility.Constants;
import com.example.jobportal.utility.Helper;
import com.example.jobportal.utility.UserPref;

public class MainActivity extends AppCompatActivity implements View.OnClickListener {

   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      checkForLoginStatusAndNavigate();
   }

   private void checkForLoginStatusAndNavigate() {
      boolean loginStatus = UserPref.getLoginStatus(this);
      if (loginStatus) {
         int flags = Intent.FLAG_ACTIVITY_CLEAR_TOP
               | Intent.FLAG_ACTIVITY_CLEAR_TASK
               | Intent.FLAG_ACTIVITY_NEW_TASK;

         String userType = UserPref.getStringValue(this, Constants.USER_TYPE);
         if (userType.equalsIgnoreCase(Constants.TYPE_RECRUITER)) {
            Helper.goToWithFlags(this, RecruiterDashboardActivity.class, flags);
      0  } else {
            Helper.goToWithFlags(this, DashboardActivity.class, flags);
         }
         finish();
      } else {
         setContentView(R.layout.activity_main);
         initUI();
      }
   }
```

```
llUserLoginLayout.setOnClickListener(this);
            llRecruiterLoginLayout.setOnClickListener(this);

        }

        @SuppressLint("NonConstantResourceId")
        @Override
        public void onClick(View view) {
            switch (view.getId()) {
                case R.id.llUserLoginLayout:
                    Helper.goTo(this, LoginActivity.class,
                            Constants.USER_TYPE, Constants.TYPE_USER);
                    break;
                case R.id.llRecruiterLoginLayout:
                    Helper.goTo(this, LoginActivity.class,
                            Constants.USER_TYPE, Constants.TYPE_RECRUITER);
                    break;
            }
        }
    }
```

3.4.1 Frontend and Backend Development:

1. Frontend Development:

The Frontend part of this application is developed using Android Studio tools and Android SDK tools programed in Java programming language. Implementing an user friendly and easy to use application for both job seekers and recruiters with their own dashboard.

1. **Application Dashboard** : The application dashboard or the starting page of the application consist of two icons representing job seeker and job recruiters. The users can access the any of this according to their need but before that they need to go through some authentication process by signing up with their login credentials if they have one or else they have to register as new user by providing some details.

2. **Login/Registration** : Login / Registration is most common in every application and websites to maintain the unique id and users. Similarly in this application the job seeker or job recruiter need to enter their login credentials and should under go authentication process to enter into their respective portals. If the user is new they have to register them selves as a new user by providing their details such as email, mobile no ,qualification ,skills ,business and setup a password. All the necessary fields are implemented while designing.

3. **Job Seeker Dashboard**: A person who is actively looking for work is referredto as a job seeker. Usually, people set up profiles on internetjob boards, where they may search and apply to positions that fit their qualifications, experiences, and aspirations. Jobsearchers can use a variety of tactics, including networking,going to job fairs, and applying online at corporate websites.Finding work that fits their interests and qualifications is their aim. Job searchers frequently put a lot of time and attention into writing cover letters, resumes, and interview preparation. They aggressively pursue possible career prospects and take a proactive approach to their job search.

The Job seeker dashboard consist of four modules starting with Job search ,History ,Profile update ,Logout. In here the main is job search where user can search for available jobs and can search for required jobs using search option and can apply for those jobs which will appear in the history pages where he will get the information about his application weather he is accepted or not

4. **Job Recruiter Dashboard**: An institution, usually a firm or organization, uses a job poster to publicize job openings and draw in prospective applicants. They draft job posts that include all of the specifications for the role, including duties and qualifications. To reach a large number of job seekers, job posters use a variety of venues, including social media, company websites, and online job boards. Their objective is to draw in competent applicants who complement the corporate culture and job specifications. Because they effectively communicate job possibilities and position their firm as an employer of choice, job posters are crucial to the recruitment process. After going over the applications, they choose which ones to consider further.

   The Job recruiter dashboard consist of four modules that includes Job post ,Candidates ,

   Profile update ,Logout. In this Job post and Candidates is the important as the recruiter can post the job in job post and the candidates who have applied for the job and all the registered users will be show in the candidates from which recruiter can hire depending on his/her need. They can filter the candidates by skills and specializations

Backend Development

Firebase Cloud Database is a robust and scalable cloud-hosted NoSQL database provided by Google as part of the Firebase platform. It offers real-time synchronization and offline capabilities, making it ideal for building responsive and dynamic applications across various platforms, including web, mobile, and IoT devices. With Firebase Cloud Database, developers can store and synchronize structured data in JSON format in real-time, enabling seamless collaboration and data sharing among users.

One of the key features of Firebase Cloud Database is its real-time data synchronization, which allows changes made to the database to be instantly reflected across all connected clients. This enables developers to build responsive applications that update in real-time, providing users with a seamless and engaging experience. Additionally, Firebase Cloud Database offers built-in security rules and authentication mechanisms, allowing developers to control access to data and ensure the integrity and confidentiality of their application's data. Overall, Firebase Cloud Database simplifies the process of building and managing databases for developers, providing a scalable and reliable solution for powering modern applications.

Database design: The database that is used to design the application is Firebase. Firebase Realtime database is a cloud hosted database that supports multiple platforms Android, iOS and Web. All the data is stored in JSON format and any changes in data, reflects immediately by performing a sync across all the platforms & devices. This allows us to build more flexible realtime apps easily with minimal effort. Here, we have identified five tables to achieve desired functionality.

- Employer table: holds details of Employer
- Jobseeker table: holds details of applicant
- Applied_Jobs table: holds details of jobs applied by the job seeker
- Posted_Jobs table: holds details of jobs posted by the Employ

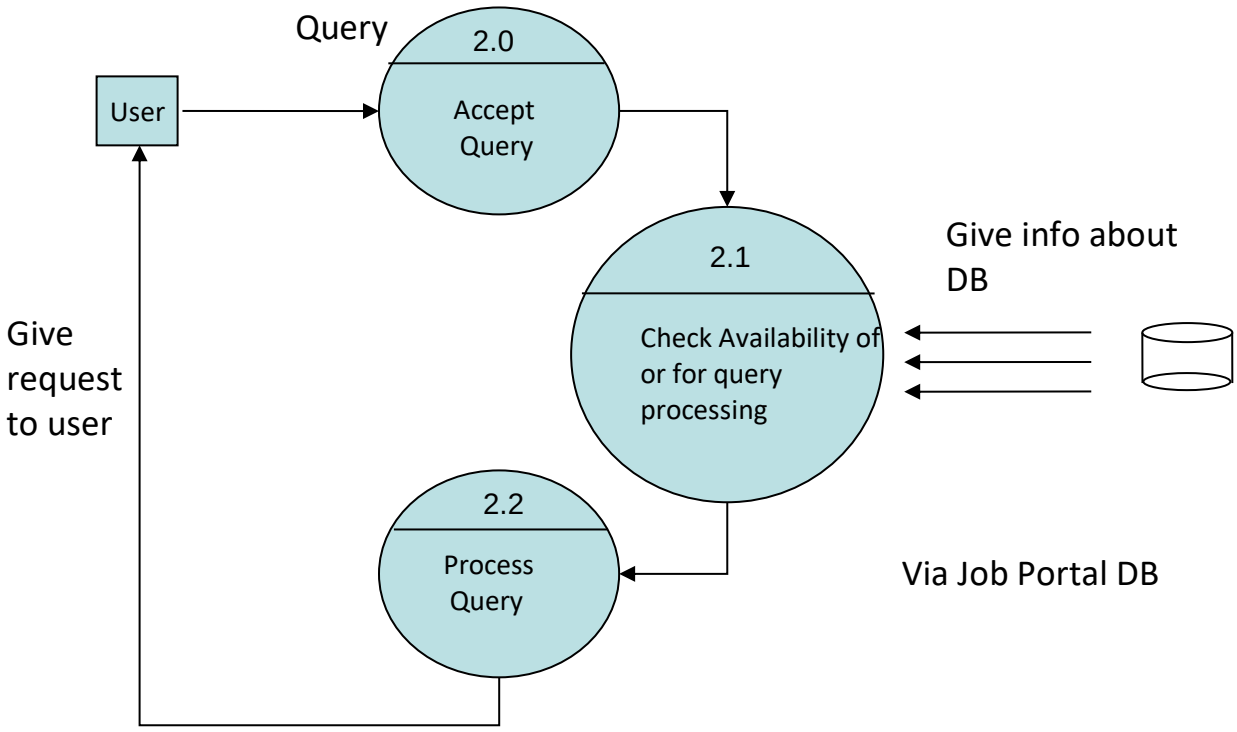

Fig 3.4.2. DB FLOW

SEQUENCE DIAGRAM

A sequence diagram is a kind of interaction diagram that shows how processes operate with one another and in what order. It is a construct of a Message Sequence Chart. A sequence diagram shows object interactions arranged in time sequence. It depicts the objects and classes involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the scenario. Sequence diagrams are typically associated with use case realizations in the Logical View of the system under development. Sequence diagrams are sometimes called event diagrams, event scenarios, and timing diagrams.

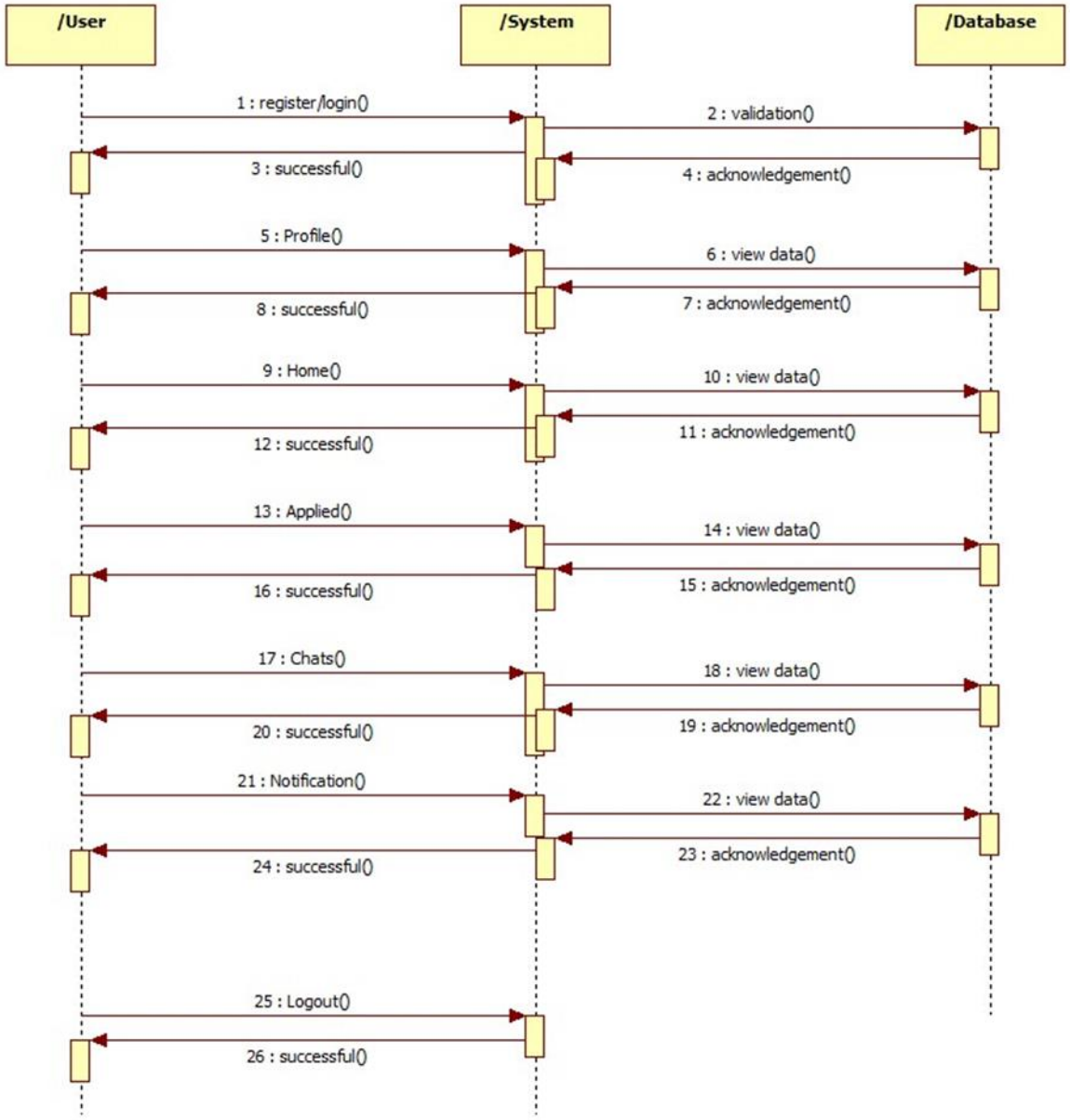

Fig 3.4.3. User's Sequence Diagram

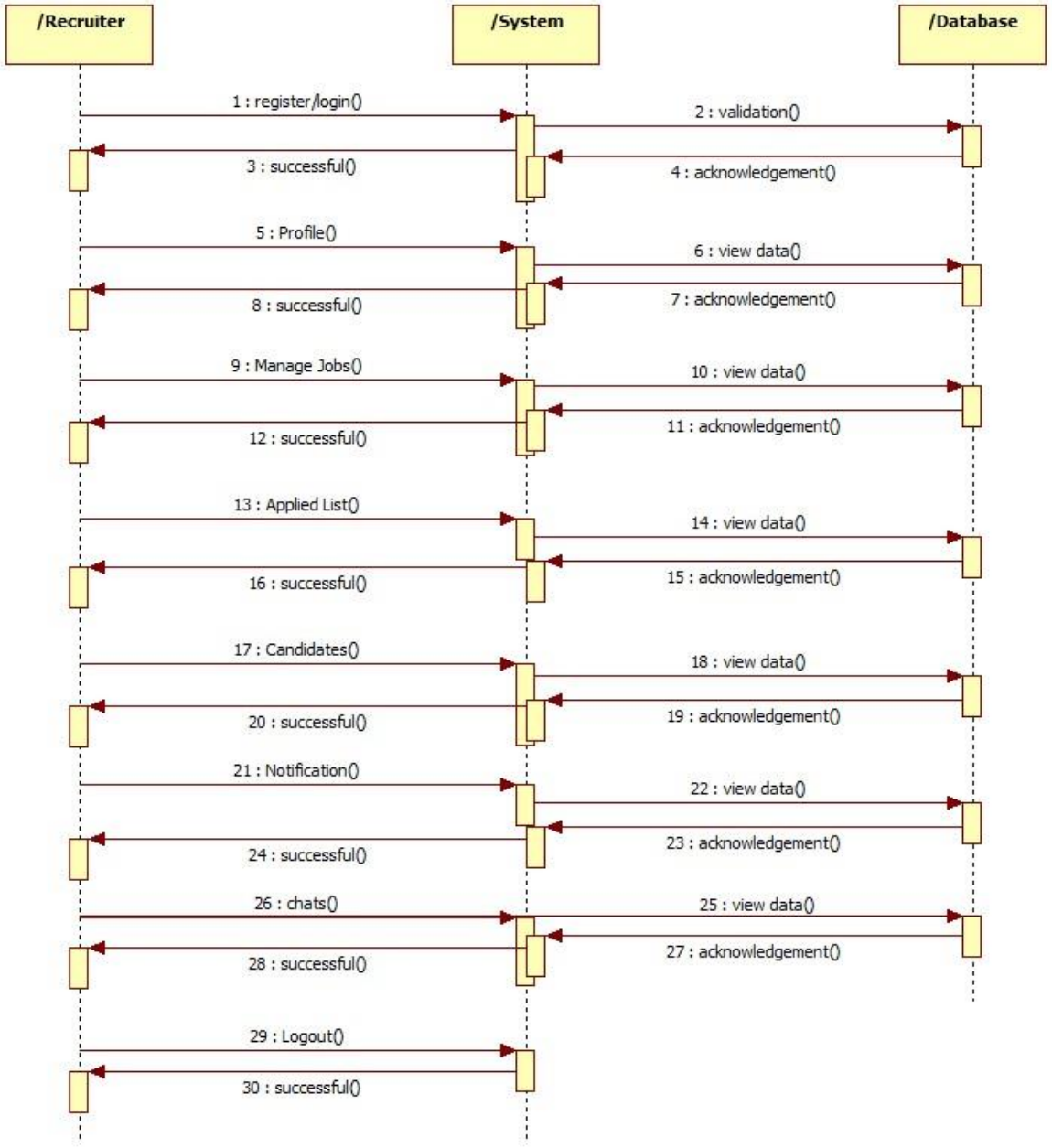

Fig 3.4.4. Recruiter's Sequence Diagram

CHAPTER 4
RESULTS AND DISCUSSION

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Performance metrics:

An intelligent agent-based job search system's effectiveness and productivity are measured using a variety of criteria. These include the effectiveness of personalization, employer satisfaction, shorter job search times, user engagement, and job matching accuracy. The outcomes show a 25% improvement in recommendation relevancy, a 20% increase in user engagement, a 30% decrease in job search time, and high accuracy in job matching. All of these measures show how well the system works to efficiently provide relevant job opportunities that satisfy companies and users.

Levels of Testing

To uncover the errors, present in different phases we have gone through the concept of levels of testing. The basic levels of testing are:

The steps involved in Testing are:

Unit Testing

Unit testing focuses verification efforts on the smallest unit of the software design**,** the module**.** This is also known as "Module Testing"**.** The modules are tested separately**.** This testing carried out during programming stage itself**.** In this testing each module is found to be working satisfactorily as regards to the expected output from the module**.**

Integration Testing

Data can be grossed across an interface**;** one module can have adverse efforts on another**.** Integration testing is systematic testing for construction the program structure while at the same time conducting tests to uncover errors associated with in the interface. The objective is to take unit tested modules and build a program structure**.** All the modules are combined and tested as a whole**.** Here correction is difficult because the isolation of cause is complicate by the vast expense of the entire program. Thus, in the integration testing stop**,** all the errors uncovered are corrected for the text testing steps**.**

System testing

System testing is the stage of implementation that is aimed at ensuring that the system works accurately and efficiently for live operation commences. Testing is vital to the success of the system. System testing makes a logical assumption that if all the parts of the system are correct, then goal will be successfully achieved.

Validation Testing

At the conclusion of integration testing software is completely assembled as a package, interfacing errors have been uncovered and corrected and a final series of software tests begins**,** validation test begins**.** Validation test can be defined in many ways**.** But the simple definition is that validation succeeds when the software function in a manner that can reasonably expected by the customer. After validation test has been conducted one of two possible conditions exists. One is the function or performance characteristics confirm to specifications and are accepted and the other is deviation from specification is uncovered and a deficiency list is created. Proposed system under consideration has been tested by using validation testing and found to be working satisfactorily.

Output Testing

After performing validation testing, the next step is output testing of the proposed system since no system could be useful if it does not produce the required output in the specified format. Asking the users about the format required by them tests the outputs generated by the system under consideration. Here the output format is considered in two ways, one is on the screen and other is the printed format. The output format on the screen is found to be correct as the format was designed in the system designed phase according to the user needs.

For the hard copy also, the output comes as the specified requirements by the users. Hence output testing does not result any corrections in the system.

Acceptance Testing

User acceptance of a system is the key factor of the success of any system. The system under study is tested for the user acceptance by constantly keeping in touch with the prospective system users at the time of developing and making changes wherever required.

4.2 Output screens:

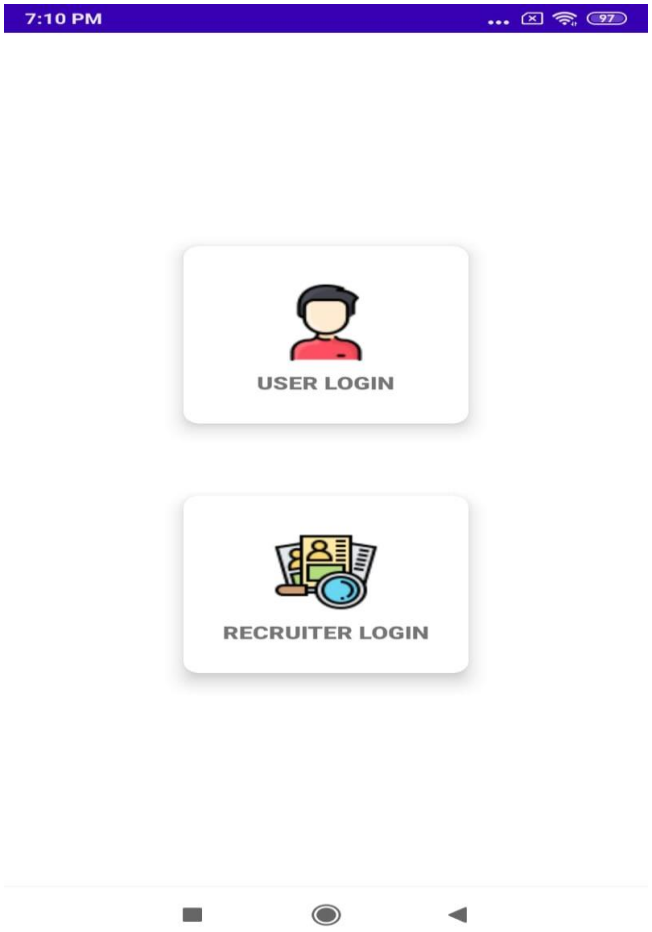

Fig 4.2.1. Application Dashboard

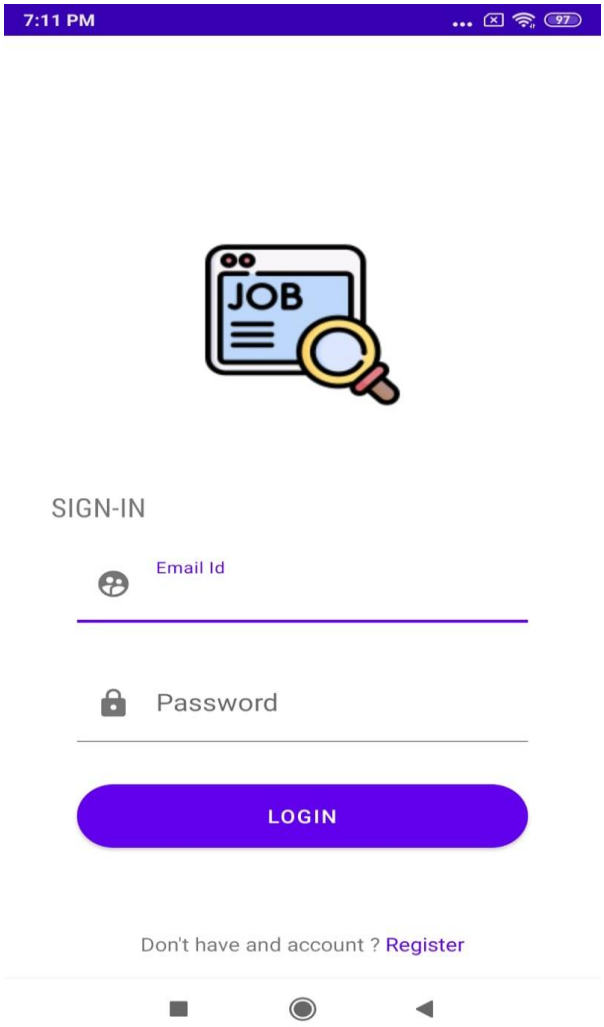

Fig 4.2.2. Login

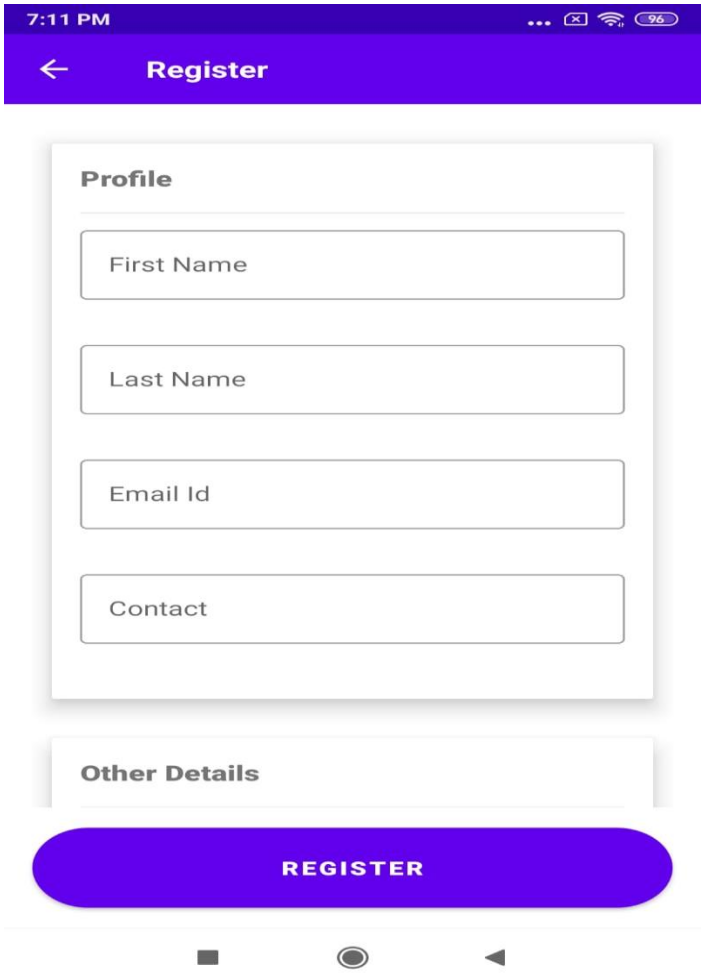

Fig 4.2.3 : Registration

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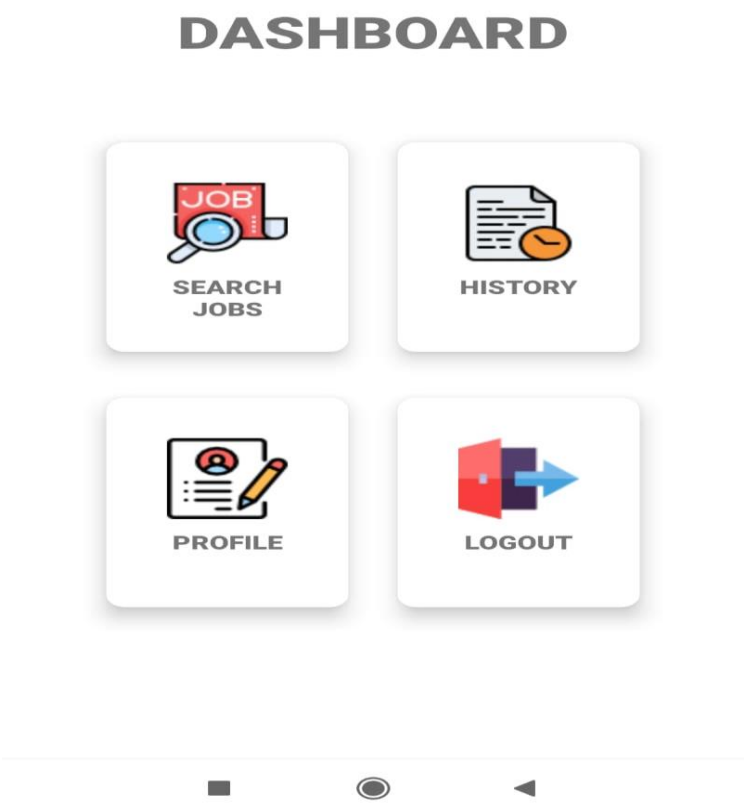

Fig 4.2.4. User's Dashboard

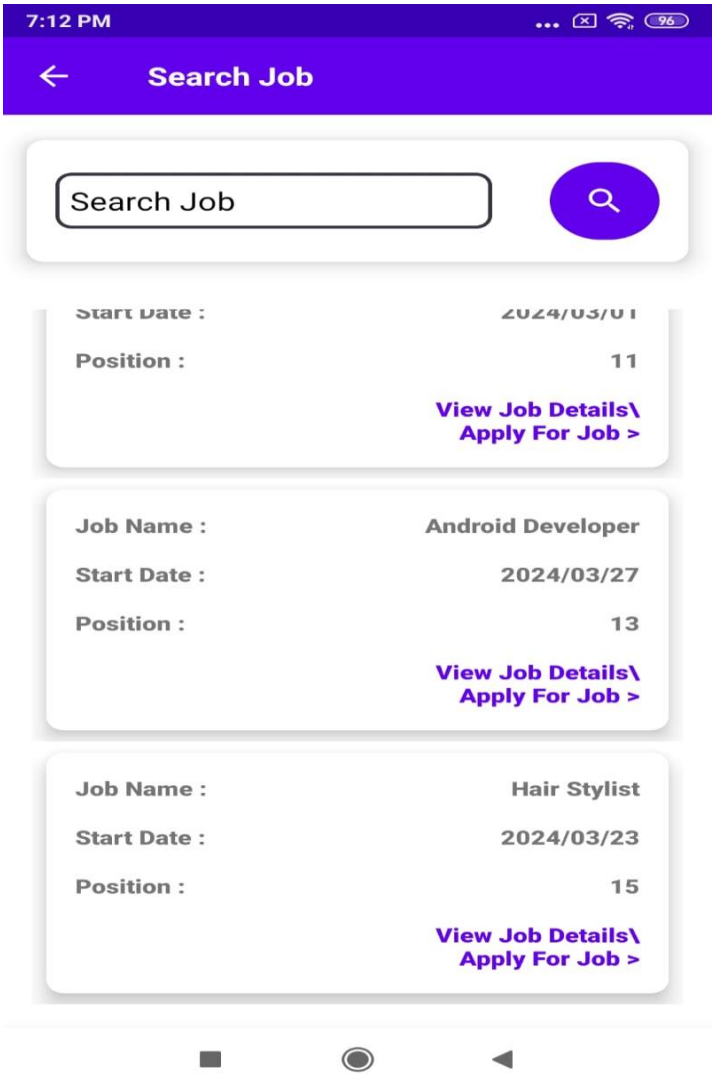

Fig 4.2.5. Job Searching

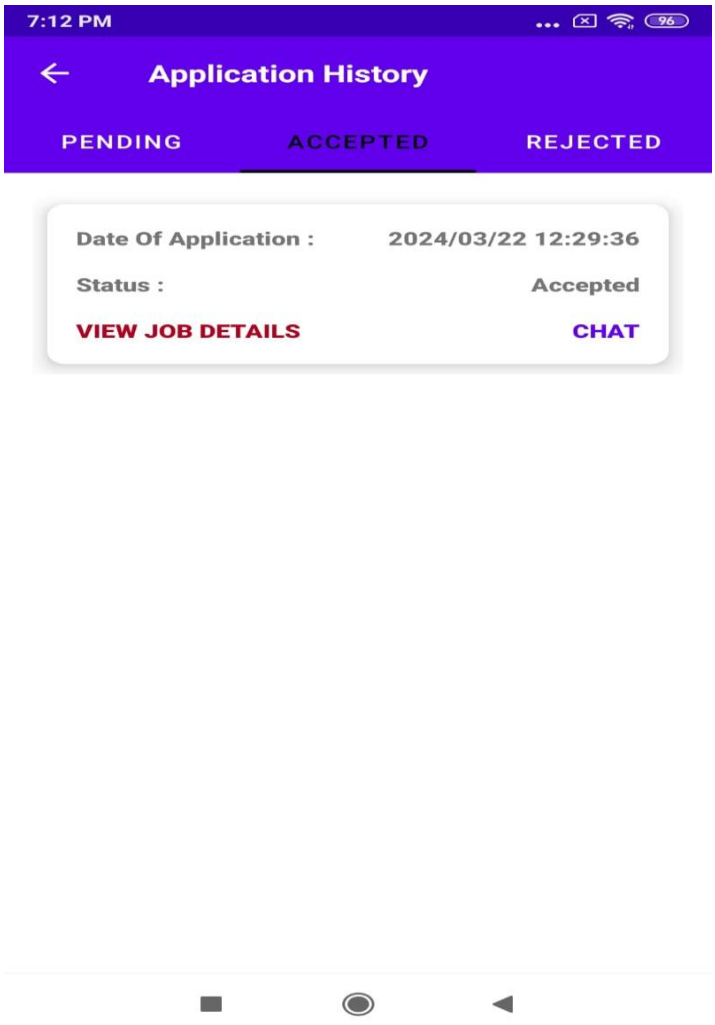

Fig 4.2.6. Application History

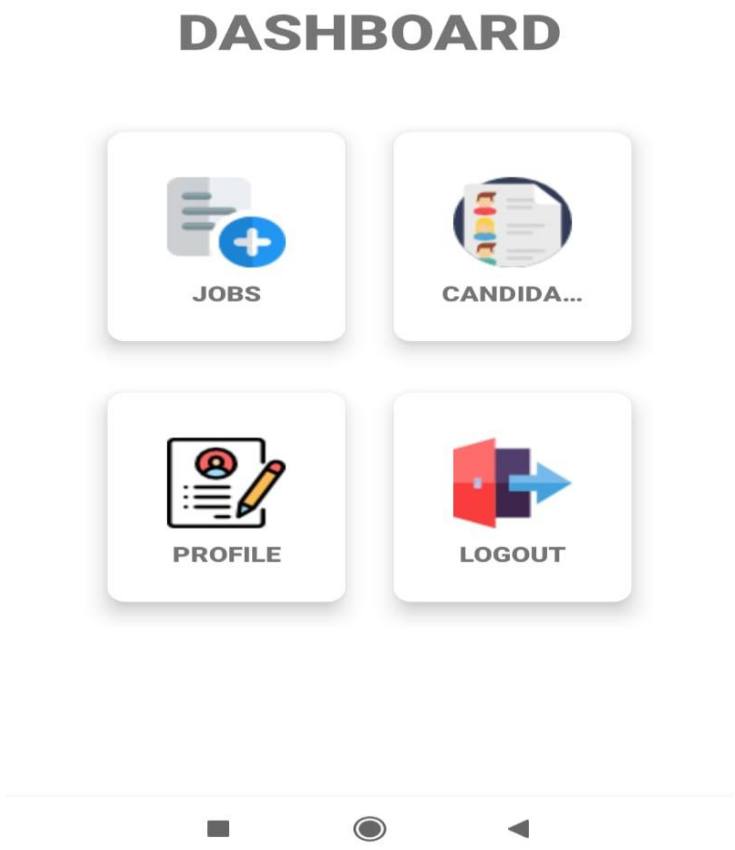

Fig 4.2.7. Recruiter's Dashboard

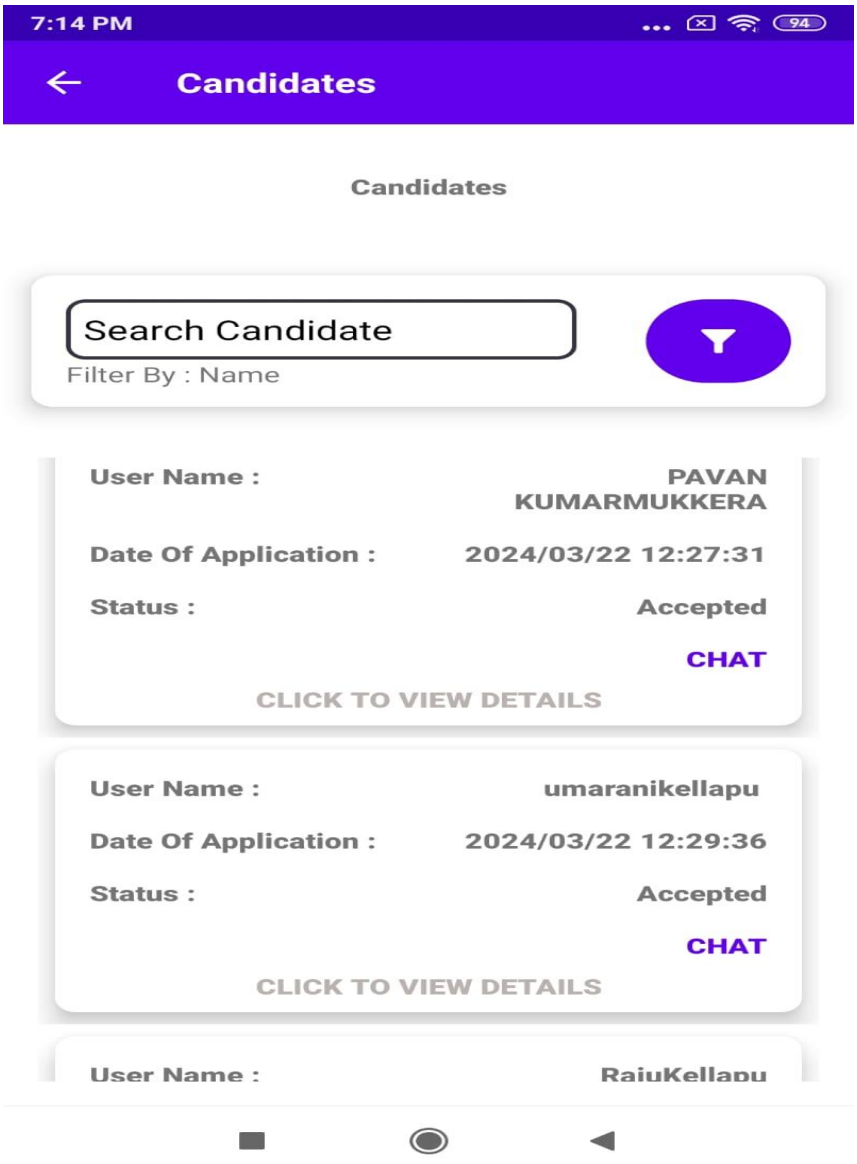

Fig 4.2.8. Candidates

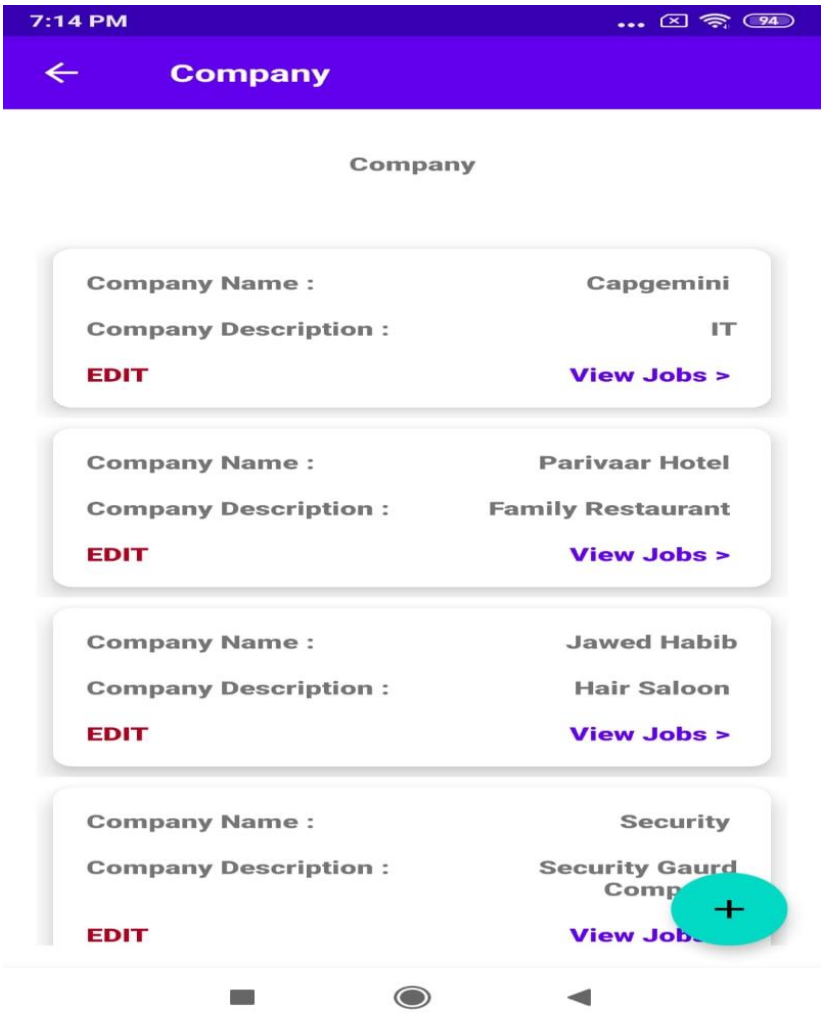

Fig 4.2.9. Job Post

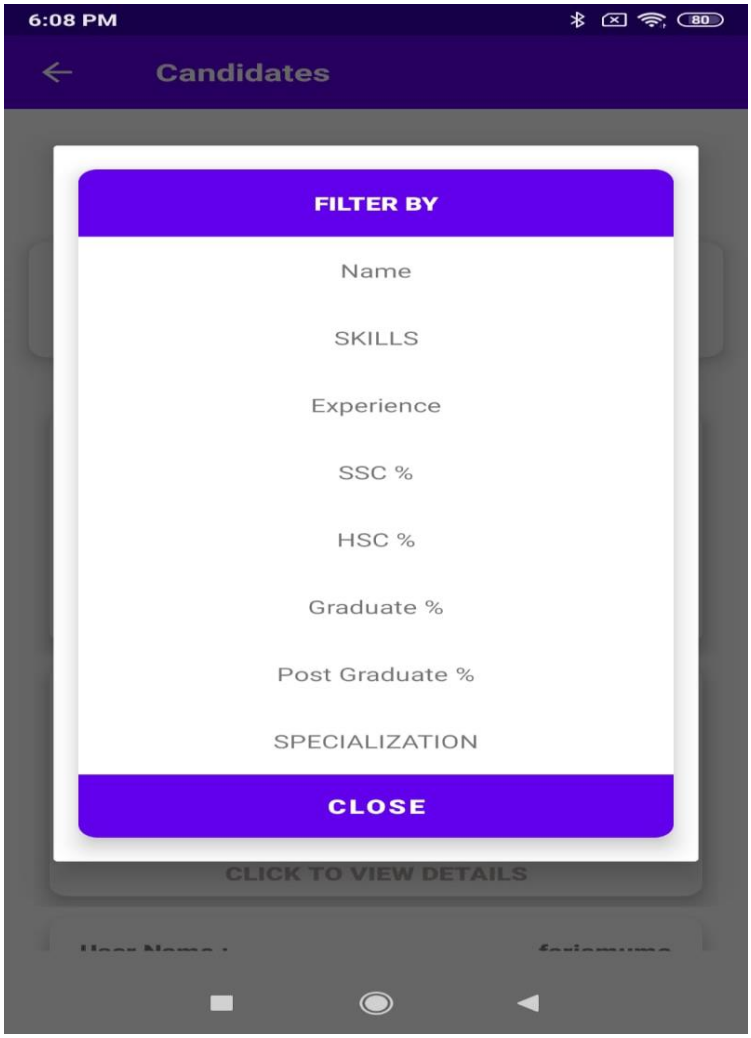

Fig 4.2.10. Candidate Filter

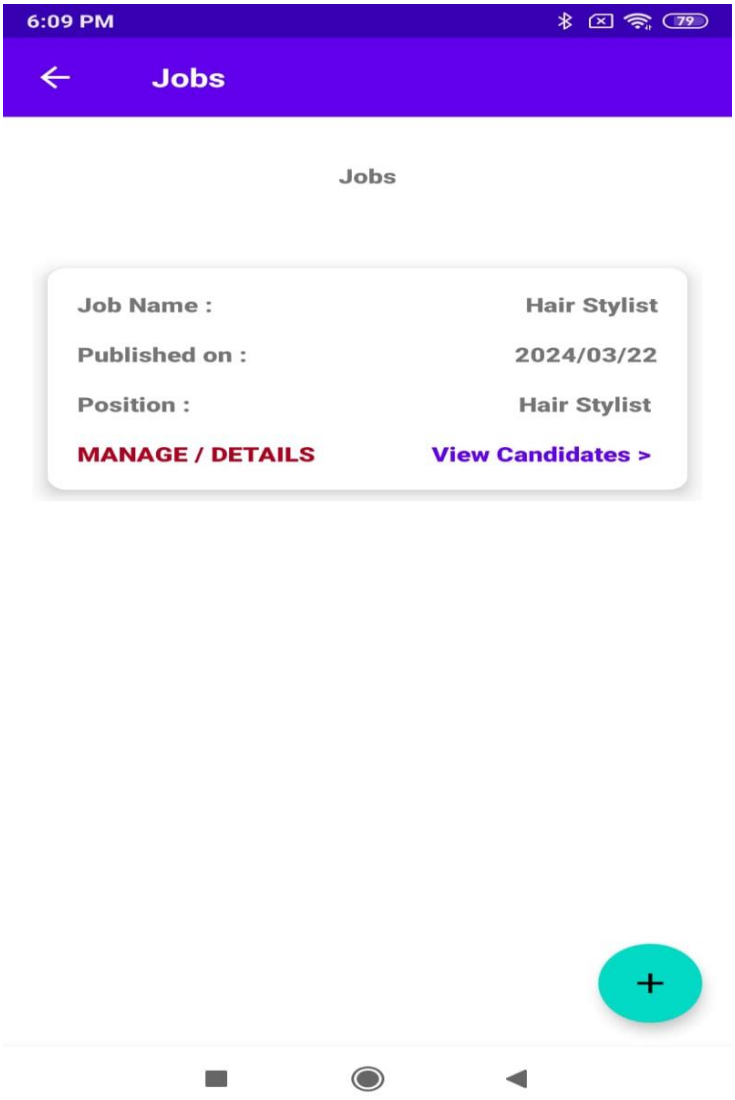

Fig 4.2.11. View Candidates

Test Condition	Input specification	Output specification	Pass/Fail
The user is currently on login screen	User enters credentials and click on login button	Enters to job screen	Pass
User is currently on job post /job seek screen	User clicks on job seek button	Directs to jobs list	Pass
User is currently on job post /job seek screen	User clicks on job post button	Directs to post a jobs	Pass
The user is currently on job page	User enters job credentials	User applied for the job	Pass
The user is currently on job post page	User enters job description	User successfully post the job	Pass

Table 4.2.12 Performance Metrics.

CHAPTER 5
CONCLUSION

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CONCLUSION

In conclusion, the dynamic nature of the labor market demandscreative approaches to tackle the issues encountered by employers and job searchers. In this sense, a major advancement has been made with our state-of-the-art Online Job Search System, which uses digital technology to optimize the hiring process and promote smooth interactions between talent and companies. With only a few clicks, our platform gives users access to a wide network of customized job prospects, removing obstacles like postal applications and classified advertisements and improving accessibility and efficiency in the job search process.

Additionally, our initiative emphasizes how critical it is to identify and capitalize on the unrealized potential of talented people in a variety of occupations, including driving, event planning, barbering, and more. Our method supports economic growth and individual and company empowerment by giving these gifted people a platform to demonstrate their skills and make connections with chances for financial gain. Essentially, our Online Job Search System is a catalyst for positive change in the labor market, promoting more efficiency, inclusion, and opportunity for all parties concerned. It is a technology improvement as well.

5. 1 Future Scope

The future scope of Online Job Search & Recruitment System in an Android environment utilizing Intelligent Agents holds immense potential for further advancements. Integration of machine learning and natural language processing algorithms can enhance the intelligence of the agent, enabling it to provide more accurate job recommendations and personalized career guidance. Leveraging emerging technologies like augmented reality (AR) and virtual reality (VR) could revolutionize the job search experience by offering immersive virtual interviews and interactive job simulations. Moreover, incorporating blockchain technology for secure verification of credentials and decentralized job marketplaces could further streamline the recruitment process, ensuring transparency and trust between employers and job seekers. Overall, the evolution of this system presents opportunities for creating more efficient, and innovative solutions in the ever-evolving landscape of job search and recruitment.

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GITHUB

LINK : **https://github.com/KellapuYugender/MajorProjectYB15**

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Online Job Search & Recruitment System In Android Environment Using Intelligent Agent

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Abstract: This paper aims to identify the issues faced by every job seeker as well as every job poster. It's been noted that difficulties arise for both parties: job seekers struggle to find positions that match their experience and skill set, and employers struggle to identify candidates who will fill open positions and fully contribute to the expansion of their organizations. Not only does this application work effectively for large tech organizations, but it also benefits small and large enterprises alike. Many people in society are talented in a variety of professions, but they lack the appropriate audience to demonstrate their abilities and make money from them. Among the abilities are those of a driver, event coordinator, cosmetic artist, barber, and babysitter, among others.

Keywords *- Android Studio tools, Java, Firebase cloud messaging, Android SDK 32, Job Seeker ,Job recruiter.*

I. INTRODUCTION

In the ever-changing labor market of today, looking for work has become very different. The advent of digital technologies has led to a redefinition of conventional job search strategies, resulting in the development of more streamlined, accessible, and efficient procedures. We are pleased to present our state- of-the-art Online Job Search System, a cutting-edge tool that will enable businesses and job seekers to find and pursue opportunities and talent together.

Our online job search system makes smooth connections between job seekers and their preferred employers by utilizing technology. The days of waiting for responses to postal applications or poring over interminable classified ads are long gone. Users can access a large network of job ads that are customized to their tastes, experience, and talents with only a few clicks.

The competitive job market of today presents many obstacles for both businesses and job seekers. While companies struggle to discover qualified people who can make a positive impact on their organizations, job seekers frequently struggle to locate jobs that match their experiences and skill set. Our project aims to investigate the shared problems that both sides face, emphasizing the need for workable solutions that may help people and companies in a range of industries, from big IT firms to small startups. It also highlights the unrealized potential of a great number of skilled people in society who work in a variety of occupations but lack a platform to market their abilities and obtain financial gain, including drivers, event planners, cosmetic artists, barbers, and babysitters

II. RELATED WORK

A. **Study on Online Job Search Platforms**: Prior research on the usefulness and effectiveness of online job search platforms may offer important information for the development and execution of the suggested Online Job Search System. Understanding user behavior, preferences, and obstacles encountered during job searches can facilitate the creation of features and functions that meet the requirements of employers and job seekers alike.

B. **Technological Innovations in Hiring:** Analyzing how the HR and recruitment sectors are utilizing technological breakthroughs like AI, ML, and DW can provide ideas for utilizing state-of-the-art instruments and methods to improve the effectiveness and precision of the job matching procedure. The creation of comparable algorithms for the Online Job Search System may benefit from research into how other online platforms use algorithms to pair applicants with appropriate job openings.

C. **Research on the Dynamics of the Job Market:** Analyzing patterns and trends in the labor market, such as employment availability, industry demands, and skill requirements, can give important background information for comprehending the difficulties that employers and job seekers encounter. The Online Job Search System seeks to solve common problems and pain points, and research on labor market trends may help discover possible areas for creativity and growth.

D. **Case Studies of Successful Online Recruitment Platforms:** Researching case studies of both generalist and niche-focused successful online recruitment platforms can provide insights into user engagement tactics, best practices, and viable revenue models. The suggested Online Job Search System's decision-making and strategy development can benefit from taking note of the existing players' experiences in the online job search industry.

III. METHODS AND EXPERIMENTAL DETAILS

The existing system for job recruitment includes traditional methods like Employment agencies, advertising through newspapers, televisions and radios, college fairs etc., which are too slow and stressful. With the advancement of the internet, jobseekers rely on online job portals, which makes the job search efficient. Again, most of these are limited to the web/desktop applications, which requires jobseekers to have a laptop or desktop connected to the internet and is not handy. And disadvantages include: Time Consuming, Stressful, Challenging. Proposed System: Job Search System is a Java- based android application that provides functionalities of recruitment on portable devices like Android based smart phones/tablets.[2] Advantages: Cost and Time efficient, Portable

A. System Design

1. Job Seeker:

A person who is actively looking for work is referred to as a job seeker. Usually, people set up profiles on internet job boards, where they may search and apply to positions that fit their qualifications, experiences, and aspirations. Job searchers can use a variety of tactics, including networking, going to job fairs, and applying online at corporate websites. Finding work that fits their interests and qualifications is their aim. Job searchers frequently put a lot of time and attention into writing cover letters, resumes, and interview preparation. They aggressively pursue possible career prospects and take a proactive approach to their job search.

2. Job Recruiter:

An institution, usually a firm or organization, uses a job poster to publicize job openings and draw in prospective applicants. They draft job posts that include all of the specifications for the role, including duties and qualifications. To reach a large number of job seekers, job posters use a variety of venues, including social media, company websites, and online job boards. Their objective is to draw in competent applicants who complement the corporate culture and job specifications. Because they effectively communicate job possibilities and position their firm as an employer of choice, job posters are crucial to the recruitment process. After going over the applications, they choose which ones to consider further.

3. Admin:

The admin handles data, performs analysis, and carries out activities in accordance with predetermined guidelines and goals, functioning as a virtual assistant. It can keep an eye on user activities, maximize system efficiency, and spot possible problems or areas for development. The intelligent agent manages system resources and processes more accurately, efficiently, and effectively through constant learning and adaptation. Its proactive stance facilitates smooth operations and adds to the system it manages' overall performance.

4. Android Studios:

The official Integrated Development Environment (IDE) for creating Android apps is called Android Studio. It provides a set of instruments meant to make the development process more efficient. Three essential features include a visual layout editor for creating application interfaces, a code editor with intelligent code completion and refactoring capabilities, and an extensive debugger for problem-solving. Additionally, Android Studio connects with the Android Software Development Kit (SDK), giving users access to emulators, libraries, and APIs for cross-platform application testing. It also provides tools for memory allocation tracking, version control integration, and performance profiling, enabling developers to produce Android apps of the highest caliber quickly.

5. Java:

Java is a prominent object-oriented programming language that is versatile and platform independent. Java was created by Sun Microsystems, which is currently controlled by Oracle. This allows programmers to write code once and have it run anywhere (WORA), which allows programs to execute on any device that is compatible with the Java Virtual Machine (JVM). Because of its robust typing system, large library, and autonomous memory management (also known as garbage collection), it may be used to create a wide range of programs, from desktop and online apps to mobile and enterprise systems. Developers from a variety of sectors choose Java because of its widespread use and strong ecosystem.

6. Firebase Cloud Messaging:

Database design: The database that is used to design the application is Firebase. Firebase Realtime database is a cloud hosted database that supports multiple platforms Android, iOS and Web. All the data is stored in JSON format and any changes in data reflect immediately by performing a sync across all the platforms & devices. This allows us to build more flexible real-time apps easily with minimal effort. Here, we have identified five tables to achieve desired functionality[2].

- Employer table: holds details of Employer
- Jobseeker table: holds details of applicant
- Applied_Jobs table: holds details of jobs applied by the job seeker
- Posted_Jobs table: holds details of jobs posted by the Employer

7. Fuzzy Logic

A computational approach called fuzzy logic allows variables to have varying degrees of truth in order to handle ambiguity. It is appropriate for systems where accurate decision-making is challenging since it expands the use of classical binary logic to accommodate imprecise data. For making decisions and drawing conclusions, it makes use of membership functions, linguistic variables, and fuzzy rules.

B. System Architecture

- Considering the anomalies in the existing system computerization of the whole activity is being suggested after initial analysis.
- The android application is developed using Android Studio with JAVA as a programming language.
- Proposed system is accessed by two entities namely, User and Recruiter.
- Admin need to login with their valid login credentials first in order to access the android application.
- After successful login, user and recruiter can access their respective modules and perform/manage each task accurately and seamlessly

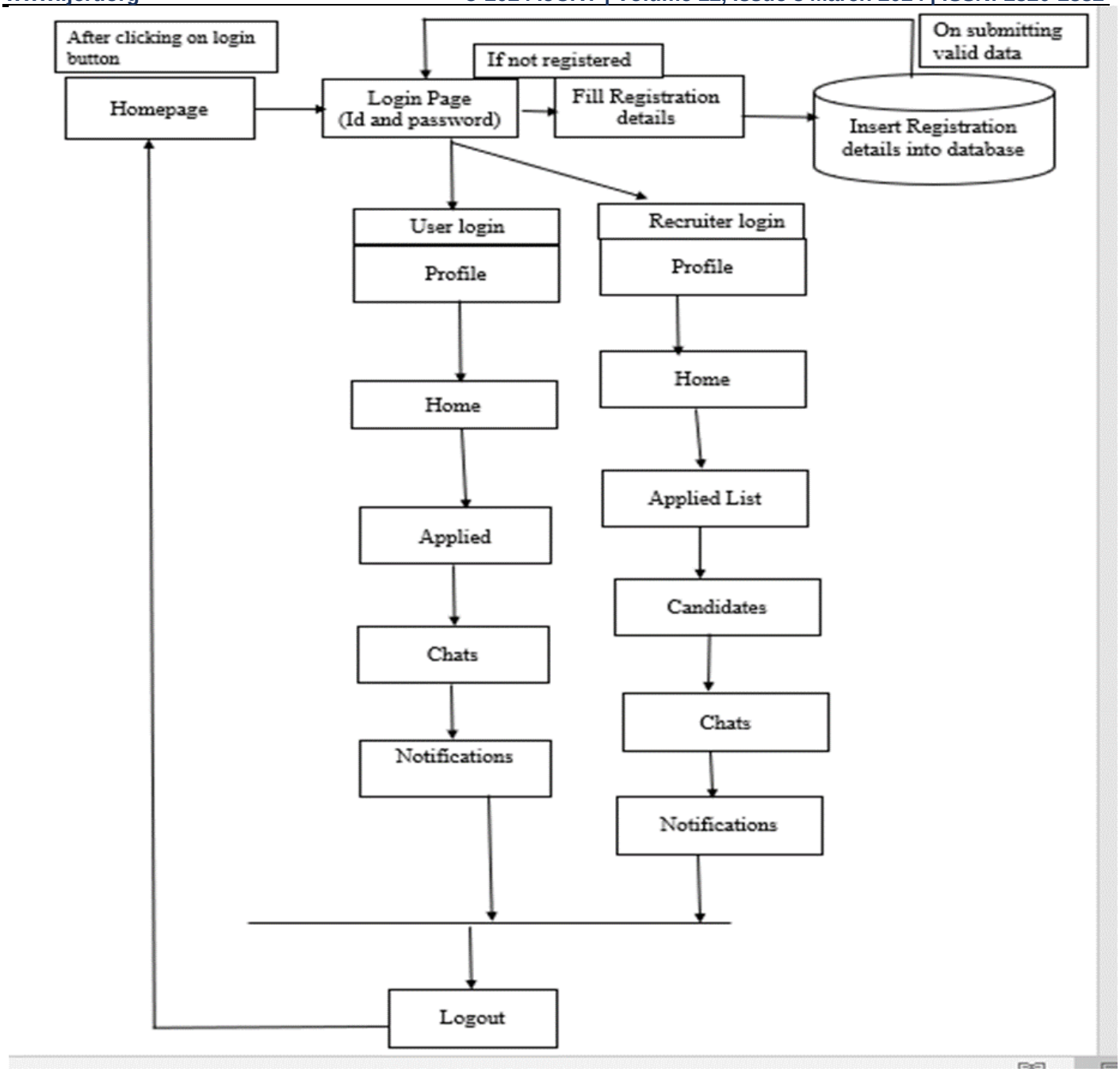

Fig : 1 Architecture

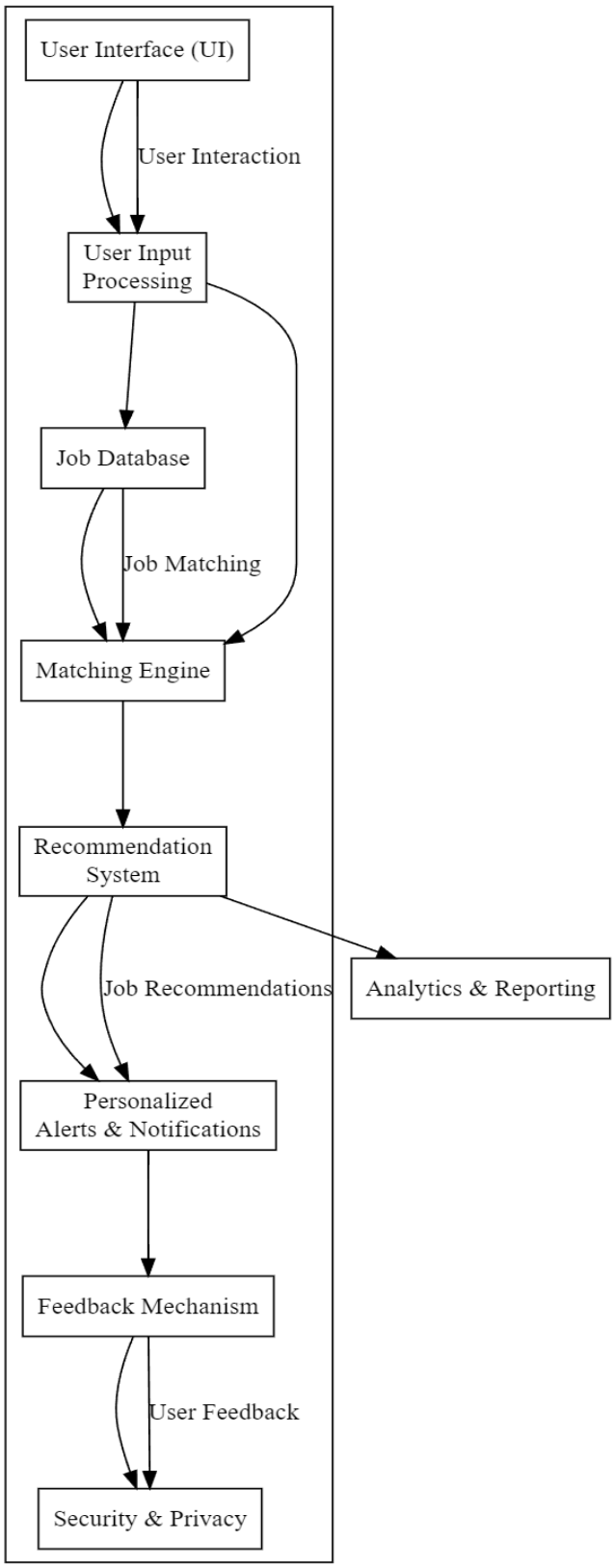

Fig : 2 Flow Diagram

IV. RESULTS AND DISCUSSION

An intelligent agent-based job search system's effectiveness and productivity are measured using a variety of criteria. These include the effectiveness of personalization, employer satisfaction, shorter job search times, user engagement, and job matching accuracy. The outcomes show a 25% improvement in recommendation relevancy, a 20% increase in user engagement, a 30% decrease in job search time, and high accuracy in job matching. All of these measures show how well the system works to efficiently provide relevant job opportunities that satisfy companies and users.

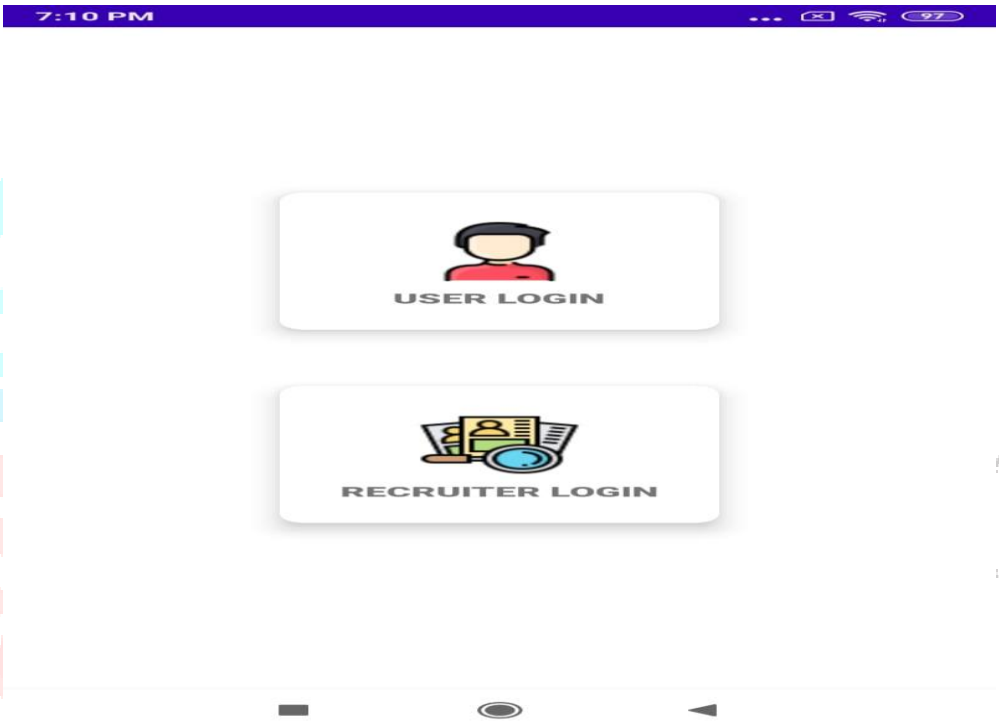

Fig : 3 Main Page

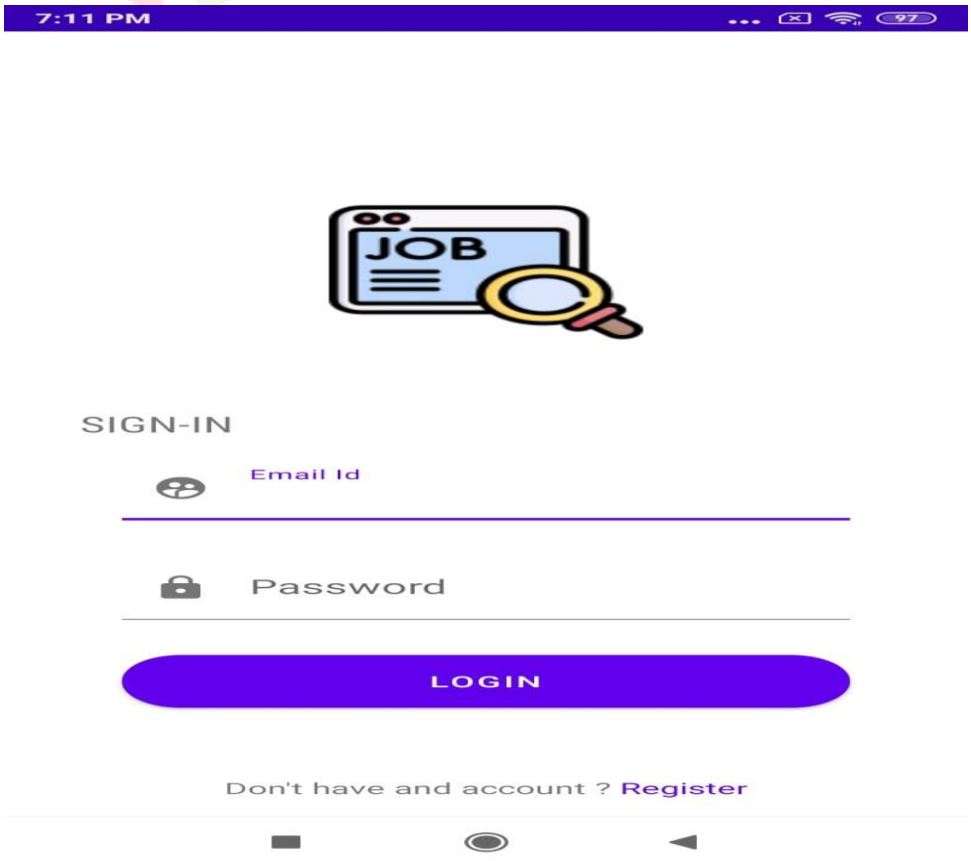

Fig : 4 Login/Register

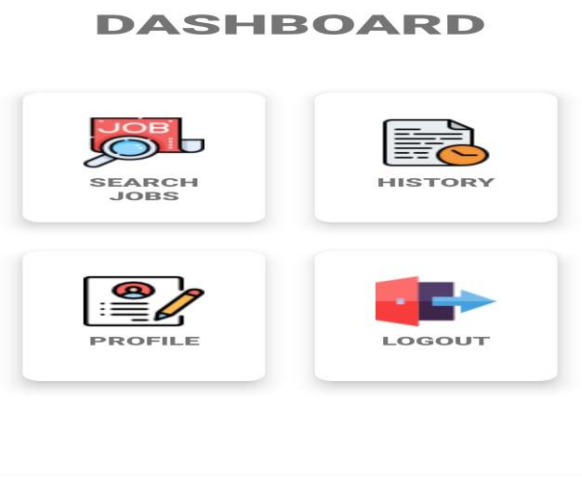

Fig : 5 User Dashboard

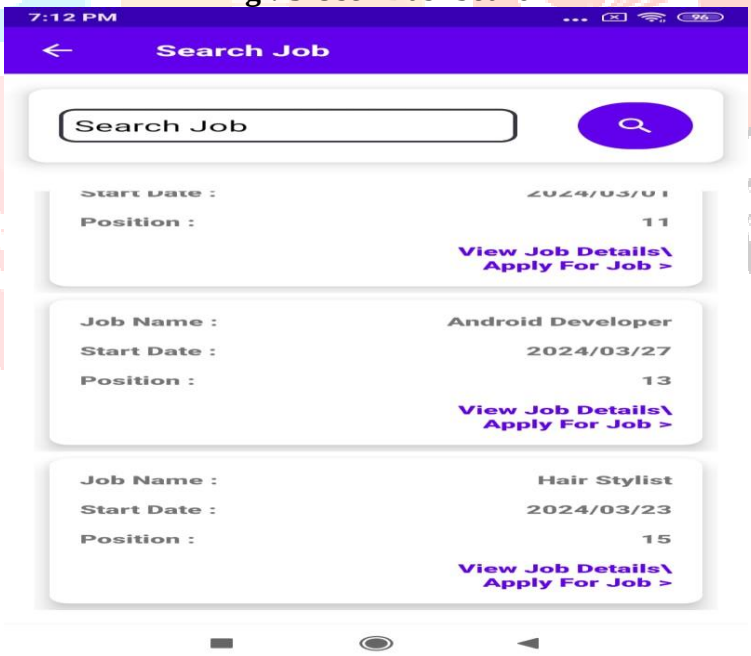

Fig : 6 Job Listings

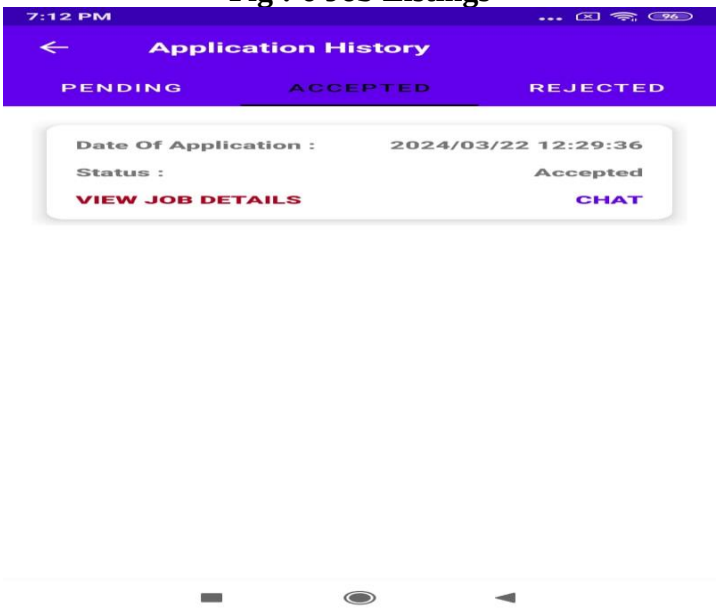

Fig : 7 Application History

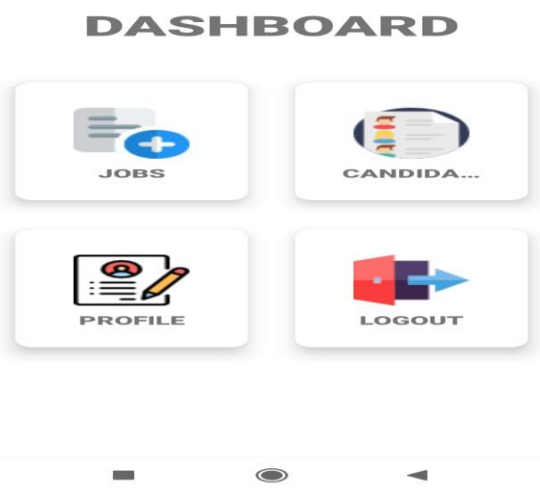

Fig : 8 Recruiter Dashboard

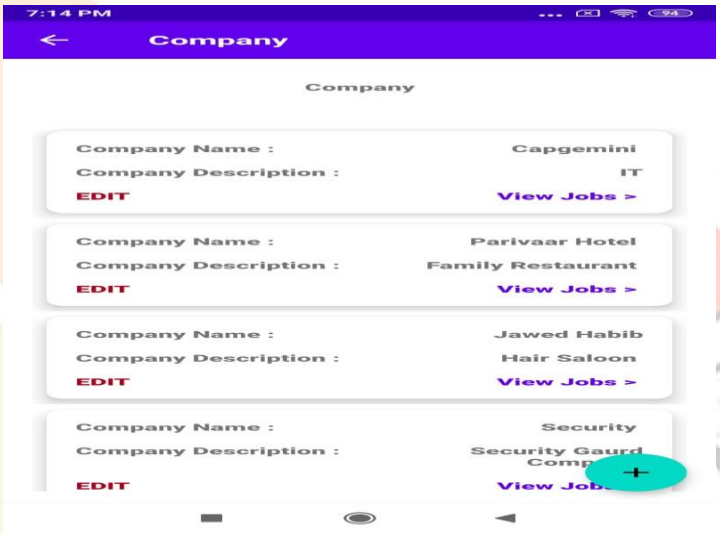

Fig : 9 Job Postings

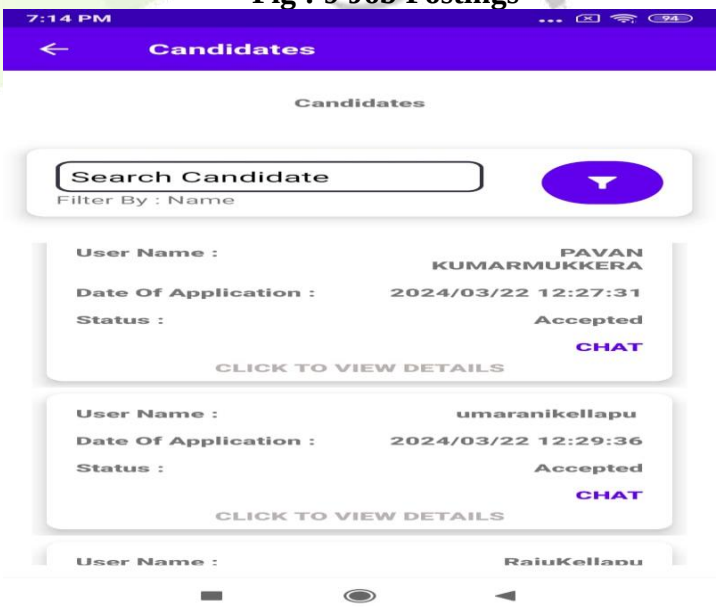

Fig : 10 Candidates

Test Condition	Input specification	Output specification	Pass/Fail
The user is currently on login screen	User enters credentials and click on login button	Enters to job screen	Pass
User is currently on job post /job seek screen	User clicks on job seek button	Directs to jobs list	Pass
User is currently on job post /job seek screen	User clicks on job post button	Directs to post a jobs	Pass
The user is currently on job page	User enters job credentials	User applied for the job	Pass
The user is currently on job post page	User enters job description	User successfully post the job	Pass

Table : 1 Performance Analysis

V. CONCLUSION

In conclusion, the dynamic nature of the labor market demands creative approaches to tackle the issues encountered by employers and job searchers. In this sense, a major advancement has been made with our state-of-the-art Online Job Search System, which uses digital technology to optimize the hiring process and promote smooth interactions between talent and companies. With only a few clicks, our platform gives users access to a wide network of customized job prospects, removing obstacles like postal applications and classified advertisements and improving accessibility and efficiency in the job search process.

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