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GATHA- EMPOWERING WOMEN THROUGH TECHNOLOGY JOB HUNTING PLATFORM

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ABSTRACT

Women empowerment is still an essential requirement in the rapidly changing world. Financial independence is the necessary foundation to develop actual women empowerment. We propose a job-hunting platform to offer women-centric opportunities and address constraints such as difficulties in securing positions in their fields of interest, challenges in finding jobs in preferred locations, limited opportunities for job switching, and flexibility in work hours. It also provides features such as voice-based interactions, support for women with diverse educational qualifications, and women-friendly policies. Methodologies used- natural language processing (NLP), machine learning (ML), and content-based filtering. It provides personalized job recommendations based on individual preferences. The system aims to create a meaningful social impact by providing equal opportunities to women and bridging the gap in employment.

Keywords- [Natural Language Processing (NLP), Machine learning (ML), Content-based filtering, Voice-based interaction, Job recommendations, Women empowerment]

I. INTRODUCTION

In today's continuously evolving world, women empowerment is still a crucial aspect, and true empowerment is rooted in financial independence. While many applications aim to support women empowerment, there's still a need for platforms that directly enhance women's financial freedom by offering access to meaningful employment opportunities. Women often face challenges such as difficulty in securing positions in their fields of interest, finding jobs in preferred locations, limited options for job switching, and access to flexible working hours. To address these constraints, we propose a job-hunting platform tailored specifically to women-centric needs.

The platform caters to two types of users: job providers and job seekers. It supports women with diverse educational backgrounds, whether they have professional education (completed undergraduate, postgraduate, or higher degrees) or basic education (up to 10th or 12th grade). The system incorporates a voice-based interaction feature, enabling both professionally educated and basic-educated women to navigate the platform with ease.

Our system encompasses a wide spectrum of job roles, from household jobs like maid, housekeeper, and cook, to professional IT positions. It emphasizes finding job opportunities that align with women-friendly policies, including companies that offer maternity benefits, childcare support, career-restart assistance, and flexibility for single parents.

The platform includes a sophisticated job recommendation system to effectively match job seekers with suitable opportunities. It employs a content-based filtering algorithm that leverages job seeker data and matches it with relevant job listings. Using TF-IDF for feature extraction from job descriptions and user queries, combined with cosine similarity, the system identifies the most relevant job openings. Natural Language Processing (NLP) and Machine Learning (ML) techniques are utilized to provide personalized job recommendations based on individual preferences. The ultimate goal is to create a meaningful social impact by fostering equal employment opportunities for women and bridging existing gaps in the job market.

II. LITERATURE REVIEW

Women empowerment is still a crucial aspect in this rapidly evolving world and financial independence of women is the main pillar of it. However despite the progress, women's still face obstacles like limited opportunities. There are currently only 18% leadership roles are held by women. Reducing the gender gap in workplaces could add $5.3 trillion to the global economy by 2025[1].

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This paper highlights the growing significance of women entrepreneurship, particularly in developing countries like India, where it serves as a pathway for economic contribution and personal empowerment. Women entrepreneurs face unique challenges such as societal norms, financial dependency, and inadequate infrastructure, which limit their ability to succeed, especially in underdeveloped regions. Despite these barriers, entrepreneurial abilities like creativity, initiative, and risk-taking enable many women to overcome obstacles and contribute to their families and the economy. The paper emphasizes the need for supportive policies, increased research, and awareness to foster women entrepreneurship, especially in smaller towns and rural areas. It advocates for creating inclusive environments that encourage women to pursue business opportunities, ensuring economic independence and societal progress [2].

This paper looks at a Job Recommendation system based on machine learning that uses a Content-Based Filtering Algorithm. It focuses on bridging the gap between Applicants & Recruiters, Specifically in the IT sector. So that applicants can get jobs based on their skills and experience and Recruiters can hire applicants who are suitable for their requirements [3].

This paper proposes a solution to the problem of job seekers and employers getting jobs that match their skill sets. The system uses Machine Learning & Natural Language Processing based techniques. It has two components, the first Resume parser which uses Python libraries such as SpaCy and PDFMiner to extract Skills from the Resume which are then sent to the second component, which is job Recommender. The Job Recommendation model uses the TF-IDF vector to analyze job titles and skills from the Resume parser to find matching jobs and uses cosine similarity for a job recommendation [4].

This paper compares 2 major approaches of recommendation systems- collaborative filtering (CF) and Content based filtering (CBF). It states that CF relies on the user's data and perform recommendation based on the inputs from similar users. CF is used when there is only small amount of data about user is available. While CBF do recommendation by calculating the similarity between user preferences and available features. For performing recommendation on complex data, CBF is used [5].

This paper addresses the issue of job seekers not finding the suitable company that match their needs. It identifies what graduates wants in company, like positive work environment, internal growth, etc. and recommend companies based on their preferences. Each company will get score based on how well it matches those preferences making it easier to recommends the suitable company to the user. The jobs are ranked based on these factors [6].

Career Craft AI system consists of two modules - Resume Analyser and Job Recommendation System which are implemented using an e-learning platform. It provides a solution for building ATS-friendly resumes and personalized recommendations. The system uses vector machine learning Algorithm and techniques of Content-based filtering Algorithm and calculates cosine similarity to group users. Natural language processing is used to provide Suggestions to improve Resume and to Recommend courses and Jobs [7].

An intelligent job recommendation system provides personalized job recommendations using cutting-edge algorithms, Artificial Intelligence & Machine Learning techniques. It is designed to speed up organizations' recruiting and recruitment process and provide job applicants with a perfect job match. It provides a chart that shows how the CV is related to a Job vacancy [8].

This paper proposes an automated job matching system which use NLP and ML. The system analyzes job descriptions and resumes and calculates the similarity between them by skill matching and other preferences and ranks the jobs accordingly [9].

This paper proposes a connection between small enterprises and workers who need employment, especially workers with modest education or having low qualifications. It provides a platform for both providers and seekers and perform matching based on their skills. Here mainly the information retrieval technique is used [10].

III. SYSTEM ARCHITECTURE

The system caters to two types of users: job providers and job seekers. Job seekers are further categorized as users having Basic education (up to 10th or 12th grade)and looking for job roles such as helper, maid, cook, and housekeeping, and users having professional education (completed undergraduate, postgraduate, or higher degrees) and looking for job roles. All users can interact with the system using voice or text-based commands.

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Job seekers will provide registration details through voice or text commands to build users' profiles and these profile data are used for profile management, the same data is stored in the User database, and user query is given as input to a job recommendation engine.

The job provider will provide the job details through voice/text interactions and store them in the job listing database, this job listing data is given as input to a recommendation engine. The job recommendation engine will take data from the job listing database and query from a user and apply steps such as cleaning data, feature extraction, and content-based filtering, as well as provide suitable jobs to job seekers and suitable candidates to job providers.

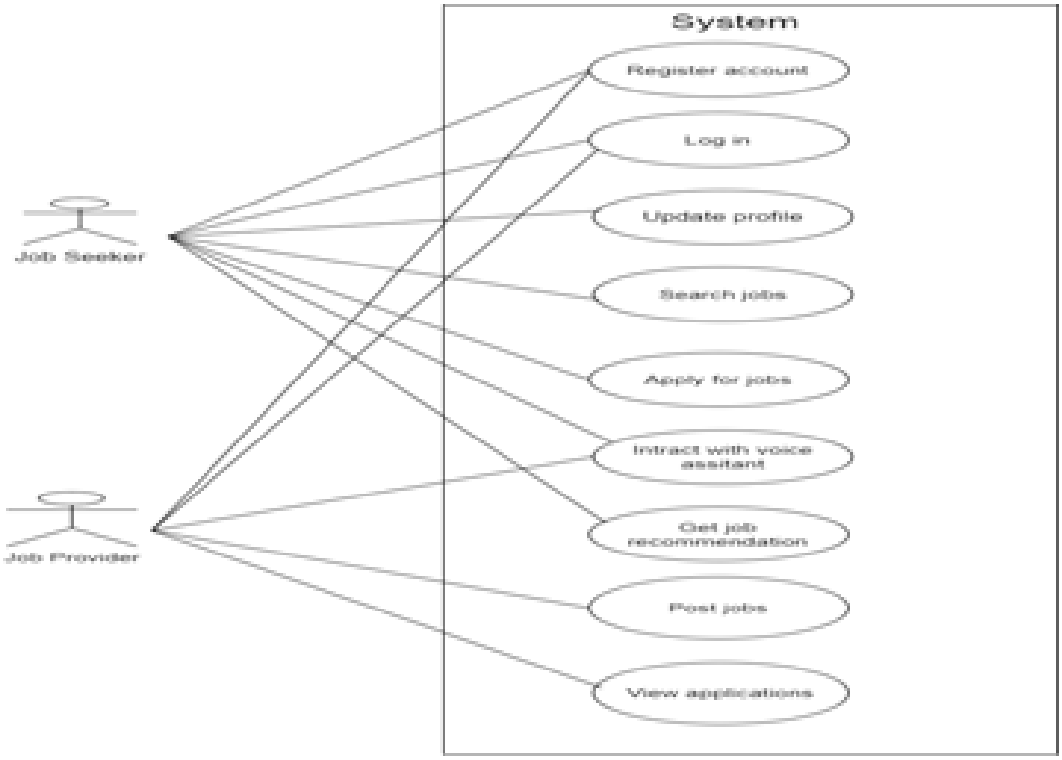

Fig.1.Use Case diagram of Gatha job recommendation system

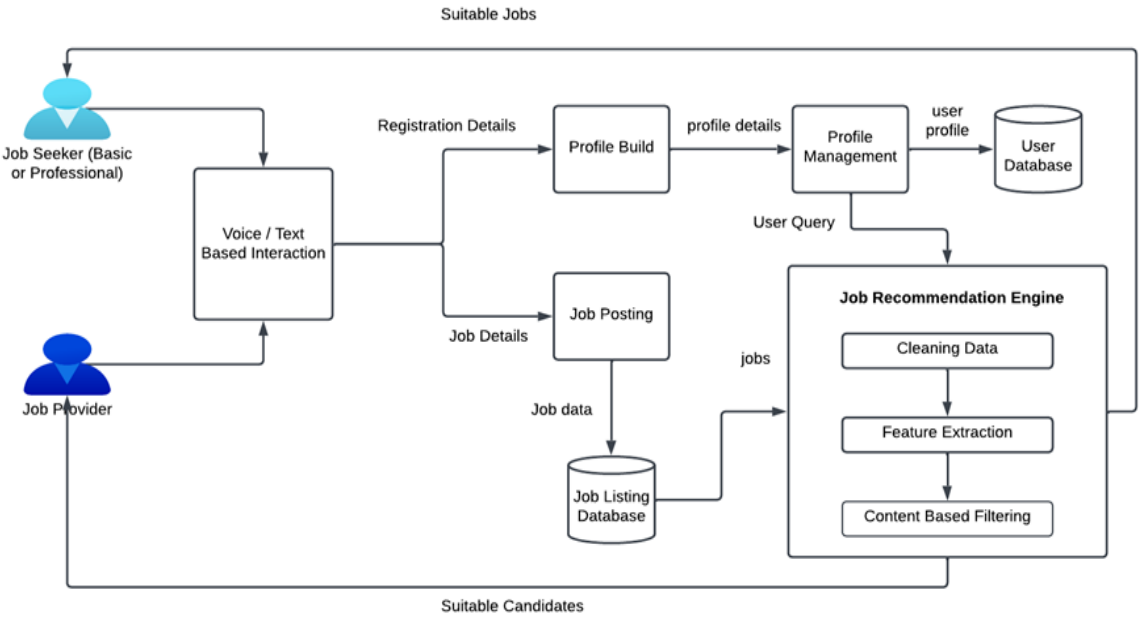

Fig.2.System architecture of Gatha job recommendation System

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IV. MODULES

Module based split of Job Hunting Platform:

A. Module 1: User Registration & Authentication

To register on platform, Job Provider and Job Seeker will provide personal, educational, and job preference details. JSON Web Token is used to authenticate users and provide access to only authorized users.

B. Module 2: Voice/Text-Based Interaction

Accessibility is a core focus of this system which offers both voice and text-based interaction for users. This feature uses Natural Language Processing (NLP) to process voice commands, allowing users to search for jobs or manage profiles or to state job details simply by speaking. This is a key accessibility feature, making the platform easy to use for people who may have limited digital skills.

C. Module 3: Recommendation Engine

Content-Based Filtering Algorithm is used for job recommendations. This algorithm compares each user's profile—such as their skills, experience, and preferences—with job descriptions. By converting these details into feature vectors, we can measure similarity, and using techniques like TF-IDF (Term Frequency-Inverse Document Frequency) helps prioritize relevant skills, making recommendations more accurate. Cosine similarity is used to measure the similarity between a user's profile and a job description.

Let A is user profile vector and B is Job description vector then the cosine similarity between them is calculated as,

Cosine similarity(A,B)= A.B/||A|| ||B||

Where ||A|| and ||B|| are magnitude of vectors.

D. Module 4: Notification System

User will receive personalized recommendations about new job postings or opportunities that match their profiles, ensuring they never miss an opportunity.

V. SYSTEM REQUIREMENT

1 Hardware Requirements:

• Processor: A standard computing processor like Intel i5/i7 or equivalent is essential for running machine learning algorithms efficiently.

• Memory (RAM): 8GB of RAM is recommended to handle data processing.

• Storage: A 256GB SSD ensures faster read and write speeds, which is crucial for handling large datasets during processing.

• GPU: While optional, a GPU (Graphics Processing Unit) can accelerate the training of deep learning models, especially for large datasets or real-time inference.

2 Software Requirements:

• Frontend: React.js for dynamic and responsive user interfaces.

• Backend: Node.js and Express.js for server-side processing and API management.

• Database: MongoDB for storing user profiles, job listings, and recommendation data.

• Authentication: JWT (JSON Web Tokens) for secure login and session handling.

• Machine Learning Libraries: TensorFlow and scikit-learn for implementing recommendation models.

• Algorithm: Content-based filtering for personalized job recommendations.

• Other Tools:

• IDEs: VS Code for development.

• APIs: For background checks and translation services.

• GitHub: For version control and team collaboration

VI. WORKFLOW

This flowchart provides a comprehensive representation of the operational workflow within a modern job application and recruitment platform, showcasing the entire user experience from account creation to the final

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job search or recruitment activities. The platform is designed to cater to two primary user types: **Job Seekers**, who are looking for employment opportunities, and **Job Providers**, such as employers or recruitment agencies seeking to hire qualified candidates.

The process initiates when users access the platform and proceed to either **register a new account** or log into an existing one. Upon submitting login credentials, the system verifies the information. In case of a failed login attempt, an appropriate error notification is displayed, halting further navigation until correct credentials are entered. For successful logins, the system proceeds to identify the user type.

Once a user is logged in, the platform distinguishes whether the individual is a Job Seeker or Job Provider. This decision point is critical as it determines the direction of the workflow.

- **Job Seeker Workflow:**

For Job Seekers, the next crucial step is the **creation of a user profile**. This profile typically includes personal information, educational background, professional experience, skill sets, certifications, and possibly links to a resume or portfolio. The system evaluates the completeness of the profile data to ensure that users can be matched with suitable opportunities.

If the profile is found to be incomplete, the user is prompted with real-time alerts or guidance, highlighting the missing sections. Some platforms may even provide smart suggestions using AI—such as recommending skills to add based on the user's industry or previous experience. Once the profile reaches a satisfactory level of completeness, the seeker can fully explore the platform's features.

After completing the profile, seekers can **search for jobs** using various filters like location, domain, salary expectations, work type (remote, hybrid, on-site), and experience level. Additionally, the platform leverages **intelligent algorithms** to offer **personalized job recommendations**, which are curated based on the user's profile, search history, and engagement patterns.

Seekers can **apply to jobs directly** through the platform, **track application statuses**, and even **receive interview invites or automated messages** from recruiters. Some systems may also provide resume tips, interview preparation resources, and progress dashboards to help applicants optimize their chances of success.

- **Job Provider Workflow:**

For Job Providers, upon successful login, the platform presents a dashboard where they can **create and publish job postings**. Each posting may require details such as the job title, responsibilities, qualifications, location, compensation, and the application deadline.

Once job postings go live, providers can **monitor incoming applications**, view seeker profiles, and use **filters or keyword searches** to identify suitable candidates. Many platforms offer **applicant tracking features**, enabling employers to mark candidates as shortlisted, rejected, or in progress. Communication tools are often integrated to allow direct messaging or interview scheduling.

Advanced systems may offer **analytics and reporting tools**, allowing recruiters to see metrics such as the number of views on a posting, number of applications received, and average applicant quality score. Employers may also receive **automated candidate suggestions** based on AI models that analyze the job description and recommend top-matching profiles.

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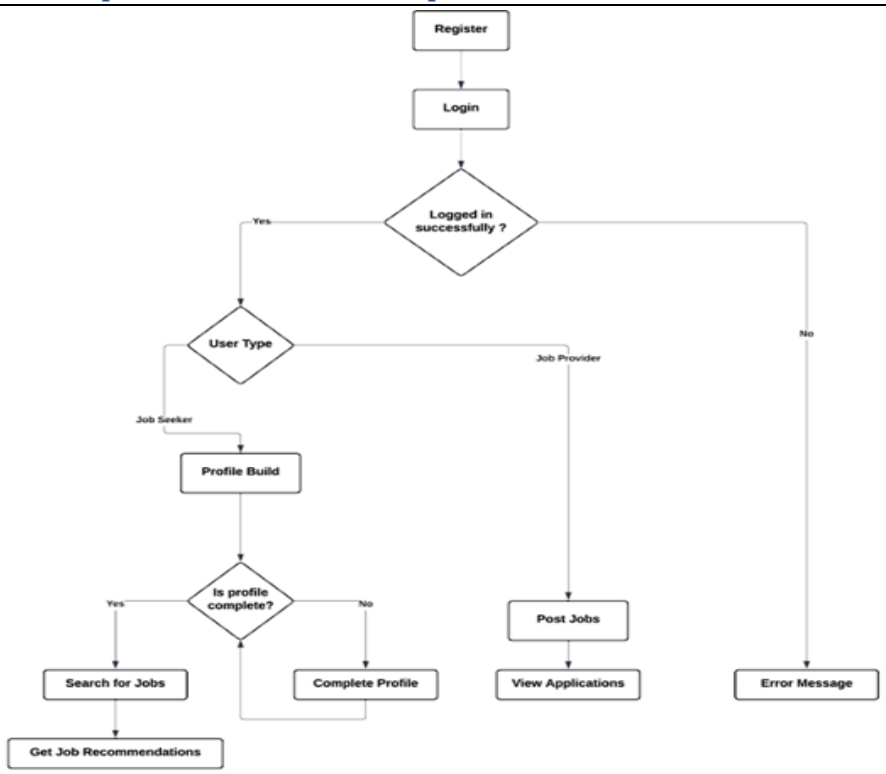

Fig.3. Gatha System Workflowsystem

VII. FUNCTIONAL REQUIREMENTS

- **User Sign-Up and Authentication:** Enable secure account creation and login for both job seekers and employers, incorporating email and SMS verification to ensure account safety and user privacy.
- **Job Listings and Search Functionality:** Allow employers to post detailed job opportunities, including job type, required skills, and location. Implement a robust search feature for job seekers with filters based on location, job flexibility, and preferences.
- **Customized Job Recommendations:** Develop comprehensive user profiles that include work experience, educational background, and preferred job roles. Use profile-matching algorithms to deliver personalized job recommendations.
- **Voice and Text Interaction:** Include a voice assistant feature for convenient, hands-free job searches and profile updates. Also, provides text-based options for user queries and platform navigation.
- **Real-Time Alerts and Notifications:** Deliver job-related alerts via SMS, email, and WhatsApp. Keep users informed about relevant openings and approaching application deadlines.

VIII. NON-FUNCTIONAL REQUIREMENTS

- **System Performance:** Ensure the platform delivers quick responses, especially in job searches and when generating recommendations, to enhance the user experience.
- **Scalability:** Design the system architecture to accommodate growth in user base and job postings, enabling efficient scaling as demand increases.
- **Data Security:** Apply strong data protection methods, including encrypted communication and secure storage. Implement robust authentication and role-based access controls.
- **User-Friendly Interface:** Build a clean, intuitive interface that supports easy navigation, making the platform accessible even to users with limited technical knowledge.
- **System Reliability:** Guarantee consistent service availability and minimal downtime to provide users with a dependable platform.
- **Recommendation Accuracy:** Aim for a minimum of 85% accuracy in job recommendations. Use feedback-driven improvements to refine recommendation algorithms over time.

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- **Maintainability:** Use a modular design approach that simplifies updates, allows easier troubleshooting, and supports long-term system enhancement.

Fig.4 Home Page

IMPLEMENTATION

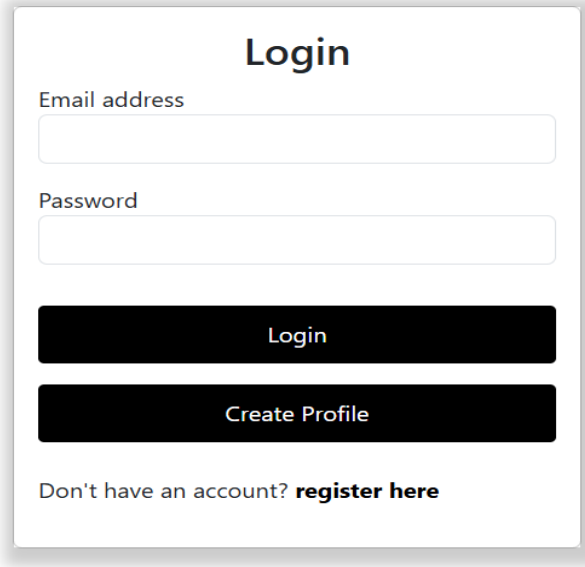
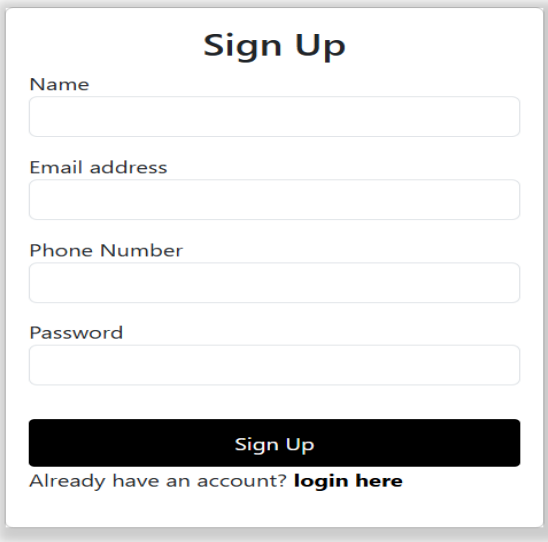


Fig 5 Login Page



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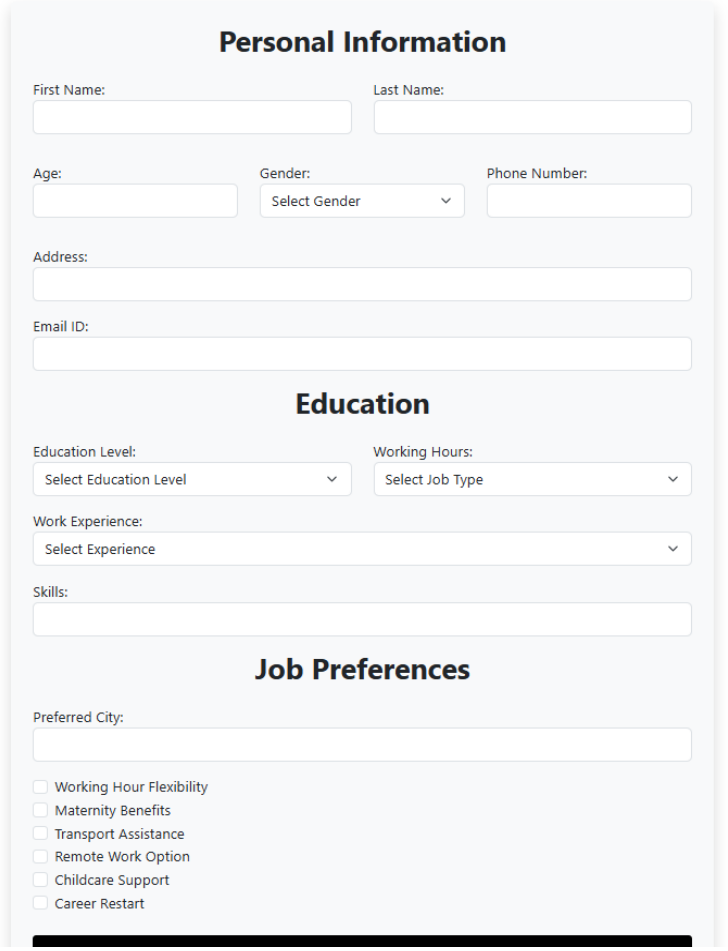

Fig 6 Registration Form Page

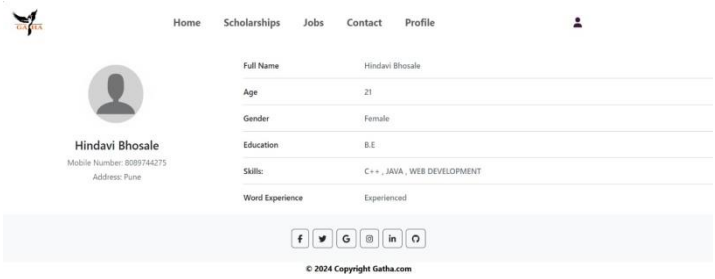

Fig 7: Profile Page

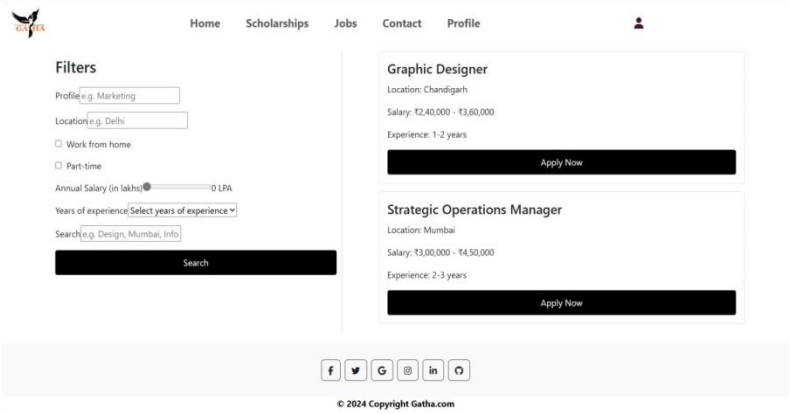

Fig 8 Job Listing Page

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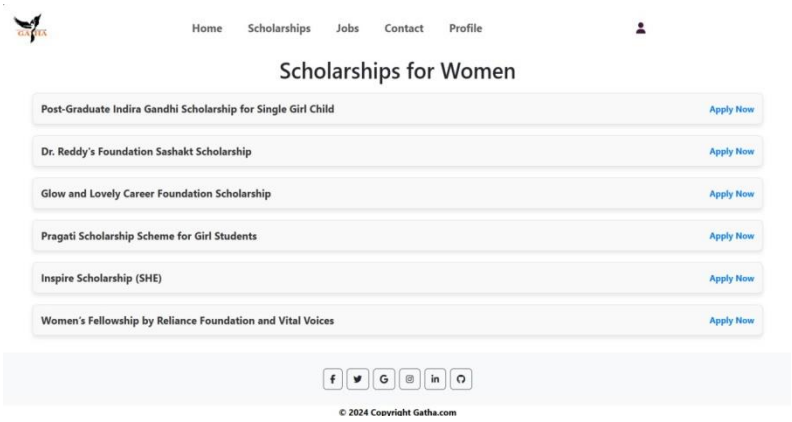

Fig 9 Women's Scholarship Page

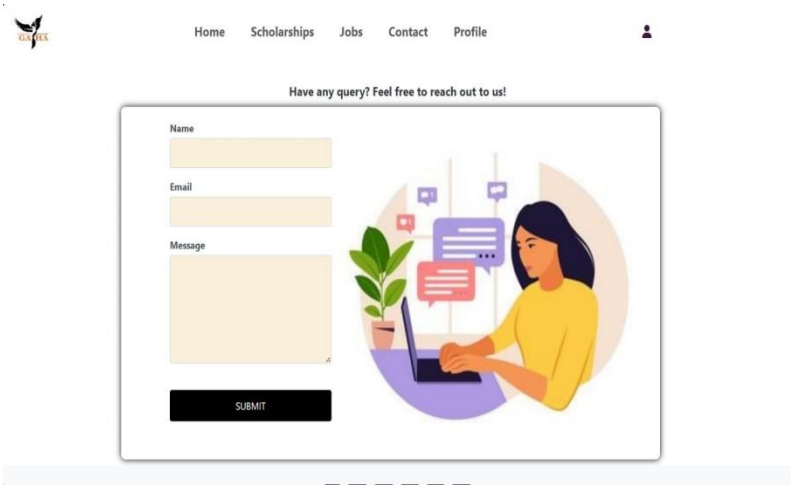

Fig 9 Contact Us Page

IX. CONCLUSION

In this research paper, we present the design and development of a robust and inclusive Job Hunting Platform specifically aimed at empowering women by addressing the unique challenges they face in employment. The platform is developed to serve both job seekers and job providers, ensuring a smooth and interactive user experience for both parties. It supports a diverse range of job categories, from informal sector roles such as housekeeping, childcare, and caregiving, to formal employment opportunities including technical and IT-based positions.

Recognizing the varied educational backgrounds of women users, the system incorporates voice-based interaction features, making it more accessible to individuals with limited literacy or technological exposure. A content-based filtering algorithm is employed to deliver customized job recommendations by intelligently matching the user's profile—based on skills, location, and preferences—with suitable job listings. This recommendation system enhances user engagement and ensures more relevant job suggestions, increasing the chances of successful employment.

By prioritizing women-centric job opportunities and focusing on user inclusivity, the platform aims to bridge the employment gap and promote gender equality in the workforce. It not only serves as a digital employment tool but also contributes to social upliftment by empowering women to gain financial independence and confidence. Although the development of several core modules is still ongoing, the proposed system holds significant potential to create a positive socio-economic impact on women's lives across various sectors.

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