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"CareerIQ"-AI Powered Career Intelligence and Resume Analyzer

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Abstract:

"CareerIQ" AI Powered Career Intelligence and Resume Analyzer is a dual user platform which is specially designed for candidates or recent graduates applying for tech related jobs and secondly, for the recruiters offering the jobs. The system's candidate part focuses on providing services like Uploading and Analysing the Resumes, Job Recommendations, Skill enhancement suggestions using AI, ATS score matching and Career Insights with Skill Gap Analysis. It uses Artificial Intelligence (AI), Natural Language Processing (NLP), Applicant Tracking System (ATS) helps system analyse candidate data making it more organized. On the other side the recruiter part focuses on services like Posting Jobs, Candidate Filtering by comparison on basis of experience, education, projects, technical and soft skills along with AI suggesting the right candidate for the role display the strengths and weakness of the applicant. The main purpose of the app is to overcome the issue of difficulty in manual screening, biased and unfair methods of hiring and improve transparency giving a fair chance to the capable candidate. It is the fastest and smartest medium of recruitment in today's digital world.

Keywords - **Artificial Intelligence, Natural Language Processing (NLP), Applicant Tracking System (ATS), Skill Gap Analysis**

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I. INTRODUCTION

This document is a template. In today's digitalized world we have seen that there has been rapid evolution in the IT industry making it necessary for corporates to switch to the easiest and fastest digital means that would save their time and reduce manual effort. Traditionally, companies used to get hundreds and thousands of resumes for one specific job role which was definitely time consuming and exhausting for the HR to shortlist the capable applicant for the role by only going through the education qualifications. Such factors create poor job role selection, dissatisfaction and wasted or neglected skill for the candidate. Due to recent developments, it has become difficult to fulfil current market demands so companies are focusing on talent hiring rather than mass hiring. This rises a need for an intelligent system that can

analyse the candidate's potential according to market demands. Our system replaces the manual decision-making process into AI recommended decisions which also involves categorizing individualized data screening and then filtering the right candidate for the job role.

As this system is designed for dual users- Candidate and Recruiter, both the users are provided with high level data visualizations. The system is well structured with interactive dashboards and screens for candidate user it has ATS progress graph that updates every time the user enhances their resumes as recommended by AI and Skill Gap Analysis in the career insights designed for showing comparative between the market requirement and user's current level according to the skills identified by using NLP respectively. Additionally, the recruiter dashboard has comparative graph showing how many of the applicants applied for the different roles for example-frontend, backend, full stack, etc. These visual features give a clear idea for the selection of right candidate making the process transparent. This system uses React.js for frontend, PostgreSQL as database to user data and Fast API for backend.

II. MOTIVATION AND OBJECTIVE

A. Motivation

The motivation for developing AI Powered Career Intelligence is to overcome the issue of manual resume evaluation processes. Most existing systems for resume evaluation lack career insights because they cannot identify a user's professional capabilities and interests. Also, they do not provide a good user experience because they force users to use several tools to evaluate their resume, find suitable jobs, and receive feedback. Additionally, they overlook only academic or technical knowledge of the applicant instead of soft skills, personal interest and goals. Overall, the main motivation behind developing this system is to bridge the gap between user's current skill sets and evolving market demands.

B. Objectives

The main objective of this AI Powered Career Intelligence system is to make the process of applying for a job and hiring the right one with required potential from the perspective of applicants and recruiters to carry on smoothly, transparently, making it easier and faster. This system is easy to handle and contains various features and visuals. Some other objectives behind proposing the system are:

1. To reduce manual effort and improve efficiency in evaluating resumes.
2. To identify skill sets and provide personalized suggestions for improvement.
3. To recommend suitable career paths based on user's profile.
4. To display relevant job recruitments aligned with user skills and qualifications.
5. To provide a user-friendly interface for easy interaction.
6. To ensure accurate and reliable analysis of user data.

III. RELATED WORK

The paper "Career Guidance System" [1] proposed a web-based platform that provides personalized career advice by analysing test results, academic performance, and labour market data. Although the system offers structured guidance, it lacks real-world testing, algorithm-level performance analysis, and any mechanism to address scalability or bias in recommendations.

The paper "Career Path Prediction Using Machine Learning Algorithms" [2] presented a system that employs Decision Tree, Random Forest, and K-Nearest Neighbours (KNN) to predict suitable career paths from a student's academic background, skills, and experience. While the model achieves reasonable predictive performance, it lacks interpretability, offers no user feedback mechanism, and does not incorporate any natural language or resume-based analysis.

The paper "Intelligent Career Counselling System Using Machine Learning and Natural Language Processing" [3] combined ML and NLP, deploying SVM and Random Forest to recommend careers from both numerical and textual data. Despite its dual-modality approach, the system lacks real-time learning, multilingual support, and integration with live job market or salary APIs, limiting its practical relevance.

The paper "Smart Cities AI Advising Chatbot" [4] developed a BiLSTM-based conversational chatbot achieving approximately 92% accuracy for academic stream guidance. However, the system is restricted to student-only use cases and provides no resume-based recommendations, job linkage, or course guidance, making it unsuitable for holistic career planning.

The paper "Career Path Prediction Using Machine Learning Algorithms" [5] extended prior prediction work using Decision Tree, Random Forest, and KNN trained on academic and experiential data. Similar to [2], it suffers from the same limitations - no interpretability layer, no feedback loop, and no NLP-driven resume validation.

The paper "AI-Based Career Guidance System" [6] applied AI and NLP techniques to generate personalised career suggestions. While the system demonstrates the utility of language-based processing, it does not address dataset diversity, lacks input node flexibility, and provides no mechanism for bias mitigation, which is critical for fair career recommendations across diverse user groups.

The paper "Career Guidance Portal Embedded with Digital Library and Skill Assessment Tool" [7] presented an integrated portal combining career guidance with a digital library and automated skill assessment. The system lacks evaluation across large populations and does not have personalisation techniques that to individual user profiles over time.

The paper "Academic Advising Chatbot (ARGO bot)" [8] proposed an AI chatbot designed to handle university academic queries through natural language interfaces. The system, however, is not career-focused and provides no job recommendations, course linkage, or ML-based decision support, limiting its applicability to career intelligence use cases.

The paper "GPT-4 vs Human Career Advisors" [9] compared GPT-4-generated career advice with that of professional human counsellors, revealing only approximately 33% alignment between the two. While the study highlights the potential of large language models in career advising, it lacks structured resume parsing capability and provides no actionable linkage between career suggestions and specific job openings or learning resources.

The paper "Smart Career Advisor" [10] employed NLP combined with SVM similarity for resume parsing and job or course recommendation. The system relies on SVM without deep models such as Random Forest or LLMs, and uses static skill-to-job mapping that fails to account for dynamic changes in industry demand.

A. ***Comparison Table***

Paper	Year	Technology Used	Method	Advantage	Limitation
[1] Career Guidance System	2024	Web APIs, Labour DB	Personalised advice via tests, results & market data	End-to-end guidance	No real-world testing; no bias check
[2] Career Path Prediction using ML	2024	Decision Tree, Random Forest, KNN	Classifies career paths from academics & skills	Good prediction accuracy	Not interpretable; no NLP analysis
[3] Intelligent Career Counselling (ML + NLP)	2024	SVM, Random Forest, NLP	Recommends careers from numerical & textual data	Dual-modality input	No real-time learning; no salary API
[4] Smart Cities AI Advising Chatbot	2024	Bil STM	Conversational guidance for academic streams	~92% accuracy	Student-only; no job/course linkage
[5] Career Path Prediction (Extended)	2024	Decision Tree, Random Forest, KNN	Predicts paths from academics, skills & experience	Multi-algorithm comparison	No resume validation; no feedback loop
[6] AI-Based Career Guidance System	2023	AI, NLP	Generates personalised career suggestions via NLP	Language-aware suggestions	No dataset diversity; no bias mitigation
[7] Career Portal with Digital Library & Skill Assessment	2023	Integrated Portal, Skill Assessment	Combines job guidance, library & skill module	All-in-one platform	No quantitative eval; no personalisation
[8] Academic Advising Chatbot (ARGO bot)	2023	NLI, Chatbot	Handles university academic queries via NLI	Conversational UX	Not career-focused; no ML integration
[9] GPT-4 vs Human Career Advisors	2025	GPT-4, LLM	Comparative study: AI vs human counsellor alignment	LLM benchmark insight	No resume parsing; no job/course linkage
[10] Smart Career Advisor	2025	NLP, SVM, Cosine Similarity	Resume parsing & job/course recommendation via similarity	Practical end-to-end pipeline	SVM only, no LLMs; static skill mapping

Table 1: Comparison of Latest Research Papers

IV. RESEARCH GAP

A. Missing in the existing work

The recent analysis of existing career guidance and prediction systems reveals that most approaches rely heavily on complex machine learning and deep learning models trained on static, pre-collected datasets. While these systems achieve competitive accuracy under controlled conditions, their dependence on fixed training data makes them incapable of adapting to real-time changes in job markets, skill demands, or new industry trends.

One observation is that the many of existing systems focus on structured or numerical input such as academic scores and predefined skill lists. Critical features such as resume parsing using natural language processing, dynamic course and job linkage, voice-based interaction, and multilingual support are largely absent. Most models operate as black boxes - they produce recommendations without providing any explanation to the user, reducing trust and usability.

B. Challenges not addressed by prior studies

The challenges that prior studies have failed to address include the following:

1. Real-time job and course integration: Existing systems are trained on datasets and therefore cannot update live job postings, current salary trends, or newly emerging skill requirements. A recommendation made today may be outdated within days.
2. Model interpretability: Most systems, those using methods like deep learning, provide no explanation for their outputs. Users receive a career recommendation with no understanding of the reasoning behind it, which reduces confidence and actionability.
3. Resume-level NLP analysis: The majority of prior work processes numerical or categorical inputs rather than raw resume text. Analysis of resumes using transformer-based models or LLMs to extract skills, experience, and gaps are largely neglected.
4. Dataset bias and fairness: Training datasets in most studies are less focused. No prior study has fairness or bias strategies.

C. The need for this work

In today's rapidly evolving job market, career decision-making has become increasingly complex for students and professionals alike. As established from the above review, existing career guidance systems are built on machine learning that require large labelled datasets, training, and frequent manual updates. These systems fail to update real-time changes in industry demand, lack the ability to parse and interpret unstructured resume data, and offer no relation between career recommendations and specific job openings or learning resources.

To these limitations, the proposed system introduces an AI-powered Career Intelligence and Resume Analyser that gives real-time, explainable, and personalised career guidance. The system integrates live job market data through APIs, performs deep NLP-based resume parsing using transformer-based models, and identifies skill gaps directly to useful courses and job opportunities. Additionally, the platform supports both candidate and recruiter workflows, by giving career intelligence from resume analysis to candidate comparison.

V. METHODOLOGY

'CareerIQ' is a dual user platform which is structurally designed and user-friendly. It is a solution over manual screening of resumes individually to shortlist candidate for specific job role. The existing systems do not provide real-time market job integration and insights, detailed job description showing salary analysis, location, etc. The applicant hence, face difficulty to know which job or area of career will suit their potential by taking their skill sets into account. Our system guides the candidate to enhance their resume and skill with the facility of suggesting which courses they need to accomplish in order to fulfil the job requirements.

The AI Powered Career Intelligence platform is developed in easy to understand and layered architecture which is also easy to maintain. The system begins with user interaction through a mobile-based interface which is develop using the react native.

Workflow:

The launch screen is the home screen where the user is given two options defining their Role- [1] I'm a Candidate [2] I'm a Recruiter

When the user chooses any of the two-role path as shown in Fig 5.1 and then it will navigate to their respective landing screens.

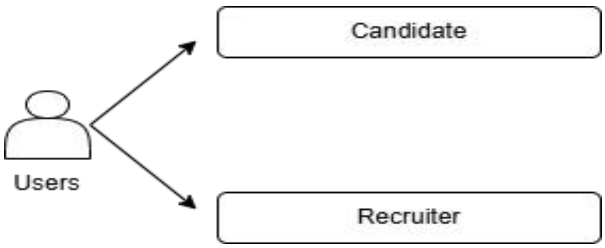


Fig 5.1: Career role paths to get started with 'CareerIQ'

Candidate Workflow:

Choosing I'm a Candidate directs to login screen where the users can create account or signup themselves on platform. This step involves details like name of user, email and password authentication. Loging in up navigates to the Candidate Dashboard where it is the main centre for overview of career progress where it displays the ATS score graph as the resume is enhanced every time. The layout follows a structured and user-centric design. It has mainly three UI cards displaying Upload Resume, Find Jobs and Career Insights. My Profile option is also setup for the detailed information of the candidate like personal details, educational background, contacts. The dashboard part is integrated with backend (Fast API) and database, providing real time updates. The dashboard UI/UX ensures -charts, metrics, actions and recent activity.

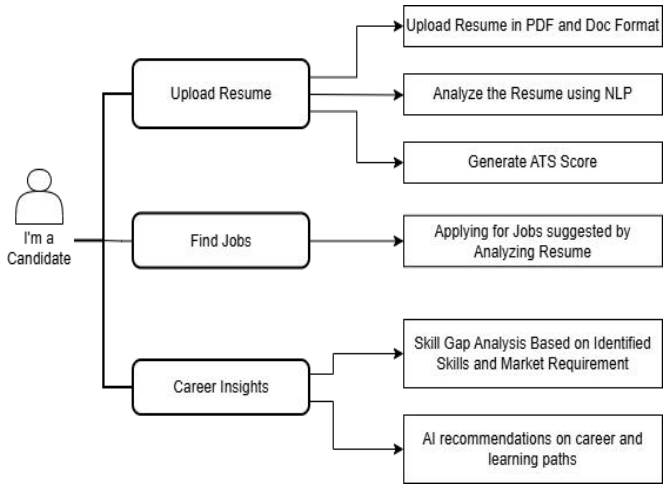


Fig 5.2: Features in I'm a Candidate part of the app

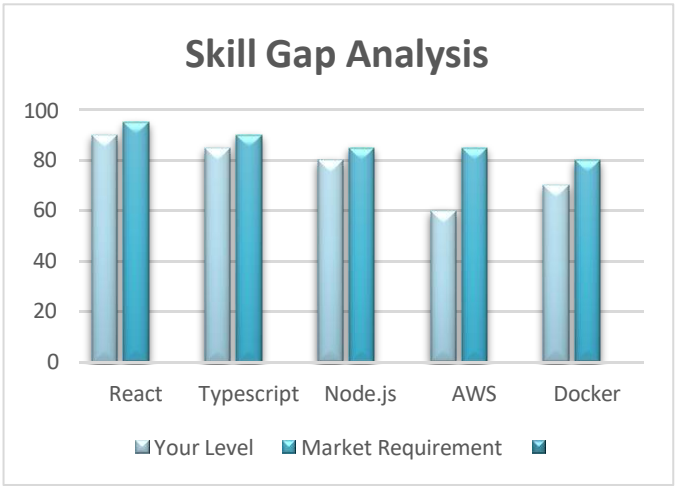


Fig 5.3: Skill Gap Analysis in Career Insights

A. Upload Resume:

When the user clicks on the Upload Resume Card on dashboard it directs to the beautifully designed UI of Upload Resume. This section provides web interface to upload the resume in formats like PDF or DOC. Clicking on Upload button the user selects the file, the frontend which is build using Expo and React Native sends the file upload request to backend API. In backend the resume file is stored in database and local storage, the system undergoes resume scanning using NLP, where it identifies keywords, skills and other content like experience, education, certificates, domains.
According to the analysed resume it gives the ATS score every time the user uploads the resume, shows AI recommendation of missing skill sets and improvements. The ATS score data is stored in database and sends to frontend in dashboard also displaying the ATS Progress Graph.

B. Find Jobs:

When user clicks on the Find Job card it lands to the screen that helps the user browse and find jobs filtering, company name, location, job role, required skills here the browsing ensures jobs are suggested and aligned with their qualifications. When user clicks on apply, the application is recorded in system database. The backend Fast API processes mathematical logic and the database stores job posting and user applications.

C. Career Insights:

When user goes to career insight section it contains major component that is Skill Gap Analysis which compares user's current skill levels with market expectations using a
Comparative bar graph as shown in Fig 5.3. Based on previous analysis AI generates recommendation on career paths, learning paths and immediate actions to improve career approach.

Recruiter Workflow:

Choosing I'm a Recruiter directs to login screen where the users can create account or signup themselves on platform. This step involves details like name of user, email and password authentication. Recruiter Dashboard is specially designed to manage job posts, monitor the applicants and make decisions with the assistance of AI. Here the records like active jobs, total applicants, shortlisted candidates are being displayed. It also includes visuals categorizing candidates based on roles as shown in Fig 5.5. In this section also it includes three cards Post Jobs, View Candidates, Compare Candidates.

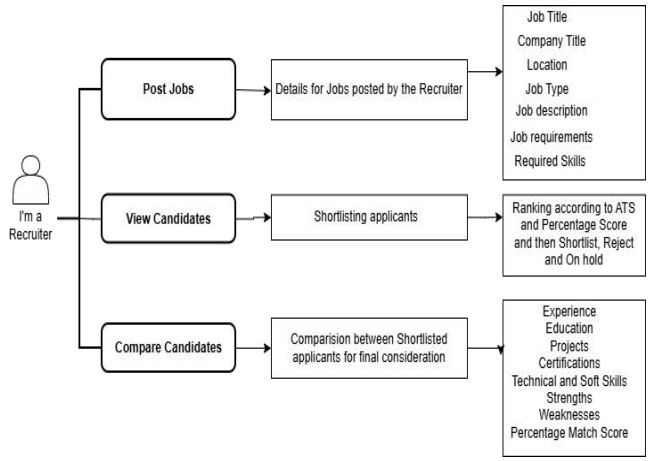
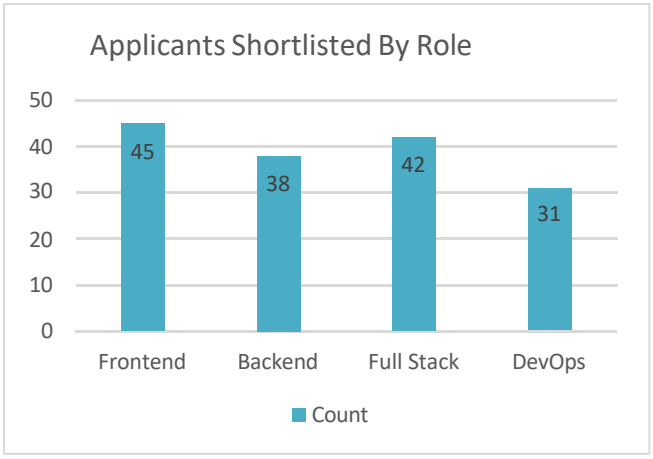


Fig 5.4: Features in I'm a Recruiter part of app



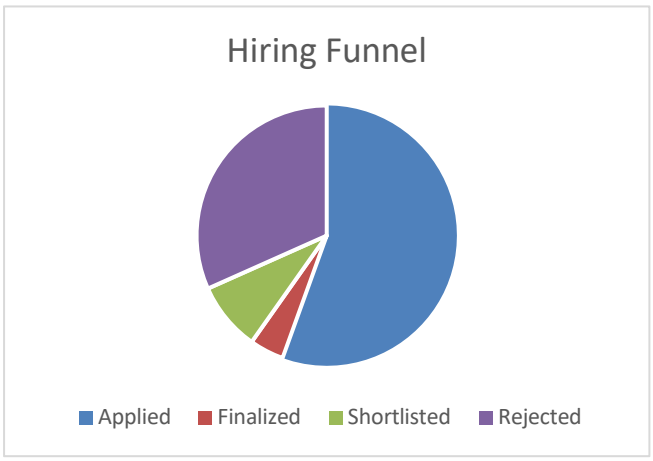


Fig 5.5: Graph at the Recruiter's Dashboard

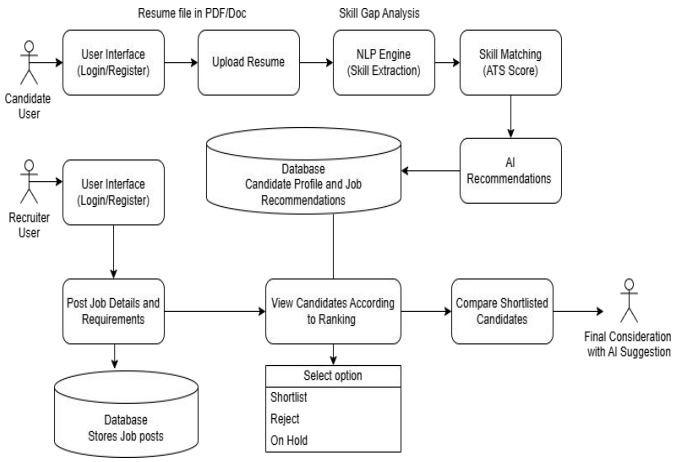


Fig 5.6: Data Flow Design of the App

A. Post Jobs

This section has the details to be filled by recruiter which contain job title, company name, location, job type (Full time, Internships, Remote, etc), Job description, requirements and required skills.

B. View Candidates

View Candidates section contains the list of applicants categorized by AI based analysis and processed algorithm. This comparison is using factors like required skills, experience level, keywords, and qualifications. Based on this analysis, the system assigns a match score (percentage) to each candidate, which represents how the candidate suits the job requirements. The list of applicants is then displayed in a ranking format, which is in in descending order of ATS match score, ensuring that the most suitable candidates appear at the top. The database stores candidate profiles, resumes and details. Infront of the applicants' options like Shortlist Reject and On Hold are present making it easier for recruiter to hire faster.

C. Compare Candidates

This section takes the data of shortlisted students from database and makes comparison between them using AI. Points like experience, education, expected salary, projects, certifications, technical

and soft skills, strengths, weaknesses, ATS match score, Percentage match Score are taken into consideration.

VI. ADVANTAGES

The proposed system uses automation of resume and career prediction using AI and ML models like NLP and backend logic. It extracts Skill Sets along with experience, education, certifications with clear understanding. The system is designed in interactive and user-friendly dashboards for both the users. Most important advantage is that it reduces the manual work load which is the main objective behind developing this system. It is unbiased and impartial trained with good decisive power. Provides personalized career guidance by studying individual data. It also uses real-time analysis to display the Skill Gap Analysis in career insights.

VII. APPLICATIONS

This AI Powered Career Intelligence platform can be used by the IT industries making the hiring process run smoothly. The main application is that is bridges the gap between job seekers and employers by score matching and other facilities with guidance of AI. Candidates can use this system to increase their knowledge and align with the skills that market demands.

VIII. CONCLUSION

A. Conclusion

Unlike traditional method of recruitment "CareerIQ" is a digital platform used for hiring process to bridge the gap between academic learning and industry requirements related career insights recommended by AI by prioritizing skills over anything. This is a smart system that offers personalization, data driven suggestions and real time industry alignment. The system uses comparative study methods in various aspects for both users making it more effective and good at decision making. Overall, it's speed, scalability, user-friendly UI and organized data makes it as smartest solution for AI-Powered Career Intelligence enhancing opportunities and platform's relevance.

B. Future Scope

The proposed system is effective and feasible to overcome many issues mentioned in the study but further advancement can be done by working on some features like candidate and job data authentication preventing fakeness and scams by adding verified badges. Possible improvements like training more advanced Artificial Intelligence models, machine learning techniques and NLP can be focused. There is also a need to add a more real time system that updates the candidate is now hired or job role is taken which is up to date. The system can be further designed and worked upon ideas like online interviews, chatbot and multi-language support system and campus recruitment systems to connect directly with colleges for fresher hiring.

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