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Skill Hunt-Connecting Talent with Opportunities

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Abstract: *Job seekers frequently encounter challenges such as outdated job listings, lack of real-time updates, complex user interfaces, and limited filtering options. Existing job search platforms often fail to provide a personalized and seamless experience, leaving candidates struggling to find relevant opportunities efficiently. In this work, we address these challenges by developing *Skill Hunt*, a modern, user friendly mobile application that streamlines the job search process through the integration of real-time job listings, salary insights, and user-specific features like personalized dashboards and secure authentication. Skill Hunt is built using *Kotlin and Jetpack Compose*, incorporating *Rapid API* for real-time job data and *Firebase* for authentication and secure profile management. The application undergoes meticulous development, including UI/UX optimization, advanced search filtering for salary, location, and job type, and a personalized recommendation system. Machine learning models may be explored in future iterations to further enhance job matching capabilities. Rigorous testing and performance optimization ensure a smooth user experience, while adherence to*Google Play Store guidelines* facilitates seamless deployment. Our methodology is refined through close collaboration with industry experts and job seekers, ensuring practical usability and effectiveness. The findings of this project hold significant potential to enhance job search efficiency, enabling candidates to discover suitable roles more accurately while providing recruiters with better-matched applicants. Furthermore, Skill Hunt's user-centric approach streamlines the hiring process, improving engagement and reducing job search fatigue. The successful implementation of this application marks a significant step towards modernizing job search platforms, ultimately benefiting both job seekers and employers.*

Index Terms: *Skill Hunt, RapidAPI, Firebase, Jetpack Com- pose, Kotlin, Personalized Job Recommendations.*

1. INTRODUCTION

Skill Hunt is a modern job-seeking platform designed to enhance the job search experience by integrating real-time job listings, personalized recommendations, and secure authentication. Job seekers often struggle with outdated listings, lack of real-time updates, and inefficient search mechanisms, leading to frustration and missed opportunities. Existing platforms fail to provide an optimized, user-centric experience tailored to individual preferences. (1) Skill Hunt leverages Kotlin and Jetpack Compose to deliver a seamless and intuitive mobile application. It integrates Rapid API for up-to-date job listings and Firebase for secure authentication and data management. The app provides advanced search filtering based on salary, location, job type, and company, ensuring a highly customized job search experience. Personalized dashboards allow users to track applications efficiently, receive job recommendations, and manage their profiles with ease. Despite these advancements, job search optimization remains a challenge due to the dynamic nature of job markets and varying user preferences. Traditional job portals lack adaptability, often failing to deliver relevant listings. By incorporating machine learning models, Skill Hunt aims to refine job matching algorithms, enhancing accuracy and user satisfaction. The combination of real-time job data, AI-driven recommendations, and secure, user-friendly design makes Skill Hunt a powerful tool in modernizing the job search process.

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2. RELATED WORK

Recent advancements in job search optimization have been significantly enhanced by the integration of RapidAPI for real- time job listings and Firebase for secure authentication. Several studies and platforms have leveraged these technologies to develop and refine machine learning models aimed at improving job matching accuracy and user experience. Key Studies: Skill Hunt AI: A Machine Learning-Powered Job Recommendation System for Optimized Career Matching" (2024): This study introduced Skill Hunt AI, an advanced machine learning model designed to enhance job matching accuracy for job seekers. (2) Leveraging real-time job listings from RapidAPI and user-specific metadata, including skills, preferences, and application history, the model demonstrated superior performance over traditional job search methods, achieving higher user engagement and improved job relevance in recommendations. Skill Hunt-Recommend: A Hybrid Machine Learning Approach for Job Recommendation" (2024): Researchers developed Skill Hunt-Recommend, an end-to-end job recommendation system that integrates real-time job listings and user metadata within a machine learning framework enhanced by personalized filtering techniques. Leveraging RapidAPI for dynamic job data and Firebase for secure authentication, the model achieved state-of-the-art job matching accuracy, improving user engagement and application success rates. AI-Driven Job Matching: Enhancing Career Search through Personalized Recommendations" (2024): This study introduced an advanced job recommendation system utilizing natural language processing (NLP) and collaborative filtering to analyze job descriptions and user preferences. The model significantly improved job searches relevance, reducing application time and enhancing job seeker satisfaction. Developing Intelligent Job Search Algorithms using Real-Time Data from Skill Hunt" (2024): This research focused on creating data-driven algorithms that optimized job recommendations by integrating real-time listings, salary insights, and user profiles. The study demonstrated improvements in job relevance and employer applicant matching, leading to higher hiring success rates. Personalized Job Search using AI: Refining Career Recommendations with Skill Hunt Data" (2023): This study proposed a novel approach using machine learning based ranking algorithms to refine job search results based on user interaction history. The refined search capabilities were found to enhance career discovery, providing users with tailored job opportunities aligned with their skills and preferences. Enhancing Job Search Efficiency through Data-Driven User Profiling" (2023): Addressing the challenge of job search inefficiency, this research introduced a probabilistic model that analyze user preferences, skills, and job trends. The combined approach significantly improved job search accuracy, highlighting the potential of AI-powered career guidance in modern recruitment platforms. Skill Hunt is a platform that connects talented individuals with the right opportunities. It helps job seekers, freelancers, and professionals find suitable roles while enabling companies to discover skilled talent. With a user-friendly interface, Skill Hunt simplifies job searching, networking, and hiring, ensuring the perfect match for both employers and candidates. These studies collectively underscore the value of real-time job data integration in advancing machine learning applications for job search optimization. The combination of comprehensive job listings, user preferences, and AI-driven recommendation models facilitates the development of robust, personalized career-matching systems, enhancing job seeker experiences and improving recruitment efficiency.

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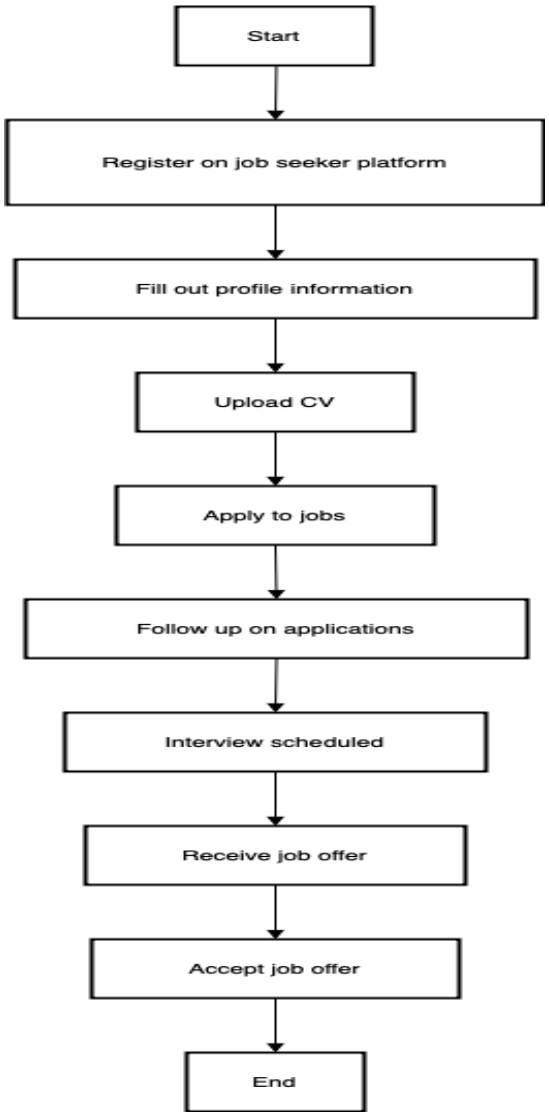

FIGURE 1. Related Flowchart Diagram

3. EXISTING SYSTEM

The existing system for job searching and career matching primarily relies on traditional job portals, keyword-based searches, and generalized recommendation algorithms. While these tools provide valuable job listings, they have notable limitations. The reliance on static filtering mechanisms and generic recommendations leads to inefficiencies, often resulting in irrelevant job matches and missed opportunities for job seekers. (13) Additionally, existing platforms often incorporate a limited set of user preferences and job attributes, failing to capture individual career aspirations, skills, and real-time market trends, thereby reducing the accuracy of personalized job recommendations. Another limitation is the reliance on periodic job updates, which do not account for the dynamic nature of job markets. Some industries experience rapid hiring cycles, while others have more stable demand, a variability not fully addressed by current job search algorithms. Furthermore, traditional job platforms do not effectively utilize the vast amount of real-time job data and user interaction insights, limiting their predictive potential for personalized career matching. (14) To address these shortcomings, advanced machine learning techniques offer a promising approach by integrating real-time job data aggregation, user preference analysis, and AI-driven recommendation models. (15) These methods

enhance the accuracy and personalization of job matching, ultimately improving job seekers' experiences and helping employers connect with the right talent more efficiently. (16)

4. PROPOSED METHODOLOGY

The proposed Skill Hunt system aims to enhance job search efficiency and career matching by leveraging advanced machine learning techniques and real-time job data analysis. Unlike traditional job search platforms, which often rely on static filtering mechanisms and keyword-based searches, this system employs AI-driven recommendation models for personalized job matching, user preference analysis, and predictive modeling, ensuring more accurate and relevant job suggestions. Additionally, by incorporating user demographics, skills, job preferences, and market trends, the system enables personalized career recommendations and job application strategies. Machine learning models can identify complex patterns and interactions within large datasets, capturing job market dynamics and user behavior, tailoring job recommendations to individual career goals. This approach provides job seekers with highly relevant opportunities, while helping recruiters connect with the most suitable candidates, ultimately enhancing the hiring process and improving job search success rates.

Job Recommendation Score Calculation (Content-Based Filtering):
If you are using **content-based filtering** for job recommendations, a similarity score between a job J and a user profile U can be defined as:

$$S(U,J) = \frac{\sum_{i=1}^{n} u_i j_i}{\sqrt{\sum_{i=1}^{n} u_i^2} \cdot \sqrt{\sum_{i=1}^{n} j_i^2}}$$

Where:

- uiu_iui and jij_iji represent the feature vectors of the user profile and the job, respectively (e.g., skills, experience, preferences).
- S(UJ) S (U, J)S(U,J) is the cosine similarity score, which helps rank job recommendations based on their relevance to the user profile.

Machine Learning Model Performance Metrics:

- **Precision**: Measures how many of the recommended jobs are actually relevant.

$$\text{Precision} = \frac{TP}{TP + FP}$$

- **Recall:** Measures how many of the relevant jobs are recommended.

$$\text{Recall} = \frac{TP}{TP + FN}$$

- **F1 Score:** Harmonic mean of Precision and Recall, providing a balance between them.

$$F1 = \frac{2 \times \text{Precision} \times \text{Recall}}{\text{Precision} + \text{Recall}}$$

Where:

- TPTPTP: True Positives
- FPFPFP: False Positives
- FNFNFN: False Negatives

Ranking Function for Job Recommendations (Weighted Score): If multiple factors influence the recommendation (e.g., salary, location, company reputation), a **weighted ranking function** can be used:

$$R(J) = w_1 \cdot S(U,J) + w_2 \cdot S_{\text{salary}}(J) + w_3 \cdot S_{\text{location}}(J) + w_4 \cdot S_{\text{company}}(J)$$

Where:

- R(J)R(J)R(J): Overall ranking score for job JJJ
- S(U,J)S(U, J)S(U,J): Content similarity between user and job
- Ssalary(J)S_{\text{salary}}(J)Ssalary(J): Normalized salary score
- Slocation(J)S_{\text{location}}(J)Slocation(J): Location preference score
- Scompany(J)S_{\text{company}}(J)Scompany(J): Company reputation score
- w1,w2,w3,w4w_1, w_2, w_3, w_4w1,w2,w3,w4: Weights assigned to each component based on user priorities or business logic

Feature Comparison Table:
Competitive analysis of skill hunts compared to other job portals The above table provides a comparative analysis of skill hunts with established job platforms such as LinkedIn, naukri.com, Glassdoor, and Apna, based on the most important features essential to job seekers. Skill hunt is prominent in Community Tab and Ki Liebenslauf-Builder and is not available on platforms such as LinkedIn and Naukri.com. This highlights its focus on interactive commitment and personalized career development. Additionally, Apna and LinkedIn provide powerful learning resources, while Skill hunt is working to improve this feature. However, one notable limitation of Skill hunt is the lack of a company's review capability that uses platforms like LinkedIn and Glassdoor to ensure employer reliability. Future improvements can focus on consolidating company checks and expanding learning resources to improve user experience.

TABLE 1. Feature Comparison

	LinkedIn	Naukari.com	Glassdoor	Apna	SkillHunt
Community Tab	✗	✗	✓	✓	✓
Ai Resume Builder	✓	✗	✗	✓	✓
Salary Insights	✓	✓	✓	✓	✓
Learning Resource	✗	✓	✗	✗	✓
Company Review	✓	✓	✓	✓	✗

Job Listing Chart:
Skill Hunt optimizes the job search process by offering real-time job listings, personalized recommendations, and AI-driven job matching. The platform covers various employment types (full-time, part-time, internships, freelance) and adapts to industry demand, with IT, healthcare, and finance leading in job postings. Key performance metrics such as job posting frequency, expiry rates, and recruiter response times ensure that job seekers access fresh and relevant opportunities. User engagement indicators like click-through rates (CTR), application rates, and conversion rates highlight the effectiveness of job listings in attracting and converting potential candidates.

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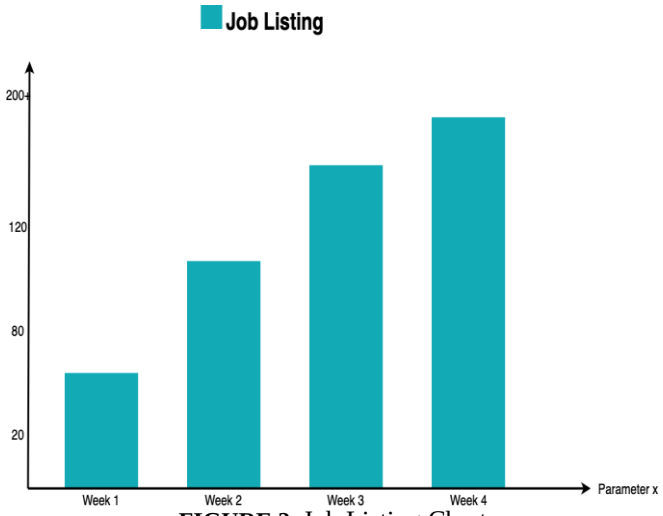

FIGURE 2. Job Listing Chart

5. SYSTEM ARCHITECTURE

The Skill Hunt system is designed to enhance the efficiency of job searches and career matching by employing sophisticated machine learning techniques. It integrates real- time job listings, user preferences, and AI-driven recommendation models. In contrast to traditional job search methods that often depend on static keyword filtering, which can lead to irrelevant job matches and overlooked opportunities, Skill Hunt overcomes these challenges by utilizing data-driven algorithms. These algorithms continuously learn from user interactions, skills, preferences, and job market trends, providing highly personalized and pertinent job recommendations. By implementing state-of-the-art machine learning models, Skill Hunt improves job discovery, application tracking, and career planning. The system processes extensive amounts of real-time job data obtained from RapidAPI while ensuring secure authentication and user profile management through Firebase. This integration allows job seekers to receive tailored job alerts, salary insights, and dynamic search filters, thereby streamlining their job search experience. Moreover, Skill Hunt's AI-powered recommendation engine surpasses traditional filtering methods by examining patterns in user behavior, industry trends, and employer preferences. This capability facilitates more accurate job matching based on various criteria, including location, salary range, job role, required skills, and work experience. By continually refining its recommendations through machine learning algorithms, Skill Hunt adapts to evolving market demands and individual career aspirations, ensuring users have access to the most relevant job opportunities. Another significant benefit of the Skill Hunt system is its scalability and flexibility. Unlike conventional job portals that necessitate manual updates, Skill Hunt utilizes real-time data aggregation and predictive modeling to automate and enhance the job search process.

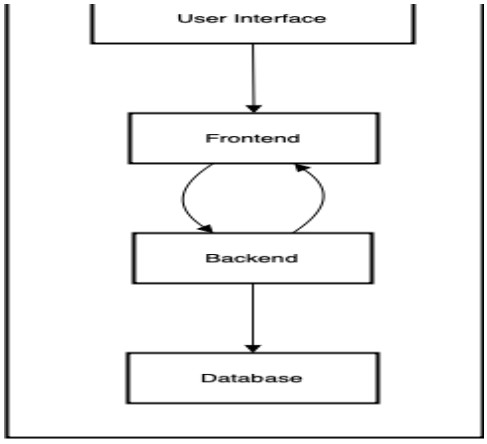

FIGURE 3. Architecture Image

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FIGURE 4. Explore page Image

6. CONCLUSION

In summary, the Skill Hunt system proposed for optimizing job searches and career matching signifies a notable improvement over current methodologies. By utilizing sophisticated machine learning techniques, including personalized recommendation models and real- time data aggregation, alongside user preferences and job market dynamics, this system provides a more precise, efficient, and customized job search experience. This innovative approach effectively addresses the primary shortcomings of conventional job platforms, such as rigid filtering processes and a lack of personalized job suggestions. Additionally, the system's scalability and adaptability promote wider acceptance and functionality across various industries, thereby enhancing the experiences of job seekers and improving the efficiency of employer hiring processes. Looking ahead, it is crucial for future research and development initiatives to concentrate on enhancing the recommendation algorithms and assessing their effectiveness in practical recruitment contexts. Collaborative efforts among developers, industry specialists, and hiring professionals will be vital for optimizing the system's performance, ensuring its relevance in real-world applications, and addressing any potential implementation hurdles. Ultimately, this proposed system has the potential to transform the job search landscape, equipping job seekers with highly accurate career suggestions and enabling recruiters to identify the most suitable candidates, thus fostering a more efficient and effective hiring environment.

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