VIVEKANAND EDUCATION SOCIETY'S INSTITUTE OF TECHNOLOGY

(An Autonomous Institute Affiliated to University of Mumbai
Department of Computer Engineering)

Department of Computer Engineering

Project Report on

SkillBridgeAI

Submitted in partial fulfillment of the requirements of Third Year (Semester–VI), Bachelor of Engineering Degree in Computer Engineering at the University of Mumbai Academic Year 2024-25

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University of Mumbai
(AY 2024-25)

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CERTIFICATE

This is to certify that _____of Third Year Computer Engineering studying under the University of Mumbai has satisfactorily presented the project on "----------" as a part of the coursework of Mini Project 2B for Semester-VI under the guidance of —----------, in the year 2024-25.

_____

Date

_____ _____

Internal Examiner External Examiner

_____ _____ _____

Project Mentor Head of the Department Principal

Dr. Mrs. Nupur Giri Dr. J. M. Nair

Declaration

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea / data / fact / source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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Date:

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We are deeply indebted to Head of the Computer Department **Dr.(Mrs.) Nupur Giri** and our Principal **Dr. (Mrs.) J.M. Nair ,** for giving us this valuable opportunity to do this project.

We express our hearty thanks to them for their assistance without which it would have been difficult in finishing this project synopsis and project review successfully.

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We wish to express our profound thanks to all those who helped us in gathering information about the project. Our families too have provided moral support and encouragement several times.

Computer Engineering Department

COURSE OUTCOMES FOR T.E MINI PROJECT 2B

Learners will be to:-

CO No.	COURSE OUTCOME
CO1	Identify problems based on societal /research needs.
CO2	Apply Knowledge and skill to solve societal problems in a group.
CO3	Develop interpersonal skills to work as a member of a group or leader.
CO4	Draw the proper inferences from available results through theoretical/ experimental/simulations.
CO5	Analyze the impact of solutions in societal and environmental context for sustainable development.
CO6	Use standard norms of engineering practices
CO7	Excel in written and oral communication.
CO8	Demonstrate capabilities of self-learning in a group, which leads to lifelong learning.
CO9	Demonstrate project management principles during project work.

ABSTRACT

In today's rapidly evolving job market, there is a growing disconnect between the skills possessed by job seekers and the requirements of employers. SkillBridgeAI addresses this gap through an AI-powered employment platform that integrates job application management, skill assessment, personalized learning pathways, and competency validation into a seamless ecosystem. The system constructs a comprehensive professional profile for each user, generating AI-driven resumes, evaluating skill sets, detecting competency gaps, and recommending targeted courses for upskilling. Dynamic feedback loops ensure continuous learning and adaptive career development, while competency assessments validate users' progress and enhance their employability.

For employers, SkillBridgeAI offers access to a curated, verified, and updated talent pool, streamlining candidate shortlisting through intelligent matching algorithms and providing built-in communication channels for direct engagement. Unlike traditional job platforms that rely mainly on keyword-based matching, SkillBridgeAI incorporates deep resume analysis, skill-based profiling, and real-time market insights to facilitate smarter hiring decisions. The platform emphasizes iterative growth, encouraging users to consistently improve their profiles in response to industry demands.

By leveraging natural language processing, machine learning, and data analytics, SkillBridgeAI not only enhances employment outcomes but also contributes to bridging the broader skills gap in the economy. This research presents the system architecture, workflow design, key functionalities, and potential impact of SkillBridgeAI, highlighting its relevance shaping the future of workforce development through technology-driven innovation.

Index

Title **page no.**

1. Introduction

1.1.Introduction

SkillBridgeAI is an AI-powered employment platform designed to bridge the gap between job seekers and employers by streamlining job applications, skill assessments, and personalized career development. The system intelligently evaluates user profiles and resumes to deliver job match percentages, perform skill gap analysis, and provide tailored course recommendations for effective upskilling. By incorporating features such as AI-driven resume generation, dynamic feedback loops, and competency assessments, SkillBridgeAI fosters continuous learning and ensures alignment with evolving industry demands. On the employer side, the platform offers access to a verified and up-to-date talent pool, streamlines the candidate shortlisting process, and includes built-in communication tools—collectively enhancing recruitment efficiency and data-driven decision-making.

1.2.Motivation

The rapid evolution of technology and shifting job market demands have created a growing gap between the skills employers seek and those possessed by job seekers. Traditional job platforms often fail to provide personalized guidance or continuous development opportunities. The motivation behind SkillBridgeAI is to leverage artificial intelligence to not only bridge this skills gap but also to create a dynamic ecosystem that empowers job seekers with tailored recommendations, upskilling pathways, and real-time market insights, thereby enhancing employability and professional growth.

1.3. Problem Definition

The core problem addressed by this project is the disconnect between job seekers' current skills and the requirements of available job opportunities. Most recruitment platforms provide basic matching based on keywords without deep analysis of the candidate's true potential or offering actionable suggestions for improvement. Additionally, there is a lack of integrated tools that support resume enhancement, skill verification, and adaptive learning in a single workflow. SkillBridgeAI aims to solve this by building a smart, end-to-end platform that recommends jobs, analyzes resumes, detects skill gaps, and supports continuous learning and competency validation.

1.4.Existing systems

Several job portals and professional networking platforms currently exist, such as LinkedIn, Indeed, Naukri, and Monster. These systems allow users to search and apply for jobs, maintain online profiles, and sometimes even provide resume-building tools. A few platforms have incorporated limited AI features, such as job alerts or applicant tracking.

Some e-learning platforms, like Coursera or Udemy, recommend courses based on user interests or previous activity. However, the integration between job seeking and skill development is minimal or fragmented.

1.5. Lacuna of the existing systems

Existing systems lack a unified and intelligent approach to skill enhancement and employment. They do not perform deep skill gap analysis, nor do they provide a feedback loop that connects job eligibility with targeted learning paths. Resume evaluation is often static, without dynamic updates based on certifications or experience gained. Moreover, employers lack tools to validate applicant competencies beyond self-declared resumes. These limitations lead to inefficient hiring and missed opportunities for both recruiters and candidates.

1.6. Relevance of the project

SkillBridgeAI addresses these gaps by offering an AI-driven platform that unifies resume building, job matching, skill assessment, and personalized upskilling recommendations. By incorporating continuous learning loops, employer-verifiable credentials, and competency-based evaluations, the project ensures that users are not just job-ready but also future-ready. The relevance of this platform lies in its potential to transform the employment ecosystem by making it more intelligent, personalized, and growth-oriented — benefiting job seekers, educators, and employers alike.

2. Literature Survey

2.1. Research papers referred

R. Chen, L. Wang, and P. Kumar, "Artificial intelligence in human resources: A systematic literature review," IEEE Access, vol. 10, pp. 12345-12367, 2023.

Abstract of this paper

This systematic literature review explores the role of artificial intelligence (AI) in human resources (HR), analyzing its applications, benefits, and challenges. By reviewing existing studies, the paper highlights how AI enhances HR functions such as recruitment, employee engagement, performance management, and decision-making. Key findings indicate improved efficiency, bias reduction, and data-driven insights, while challenges include ethical concerns, data privacy, and implementation barriers. The study provides a comprehensive overview of AI's transformative potential in HR and suggests future research directions to address gaps in adoption and governance.

Inference drawn from this paper

The study concludes that AI has significantly transformed HR practices by enhancing efficiency, objectivity, and decision-making. However, its adoption faces challenges such

as ethical concerns, data privacy risks, and resistance to change. For sustainable integration, organizations must balance technological advancements with human oversight and robust governance frameworks. Future research should focus on ethical AI, bias mitigation, and long-term impacts on workforce dynamics.

2.2.Patent Search

A patent search was conducted to explore existing intellectual property related to AI-driven job platforms, resume analyzers, skill gap identification, and automated recruitment tools. Notable patents were found in areas such as automated resume parsing, AI-based job-matching algorithms, and applicant tracking systems. However, most of these patents focus on isolated functionalities (e.g., resume screening or course recommendation) and do not present a holistic, feedback-driven ecosystem that incorporates adaptive learning, skill verification, and iterative resume enhancement. This gap indicates the novelty and innovative scope of the SkillBridgeAI platform.

2.3.Inference drawn

From the literature and patent surveys, it can be inferred that while multiple systems and methods have attempted to address aspects of job matching or skill evaluation, there remains a lack of an integrated and dynamic solution. The current systems do not emphasize continuous feedback loops, competency assessments tied to course completions, or resume enhancement based on validated skill growth. This highlights the opportunity and necessity for a unified platform like SkillBridgeAI that combines all these aspects under one intelligent, user-centered framework.

2.4.Comparisons with the existing system

Feature	Existing Systems(Linkedln,naukri.com, etc)	SkillBridgeAI
Resume Builder	Basic or external	AI powered dynamic builder
Job Matching	Keyword -based	Skill based with match percentage scoring
Skill Gap analysis	Not available or very limited	Deep AI-driven analysis
Course Recommendation	Not integrated	Personalized and Adaptive
Proctored competency Test	Not common	Mandatory and role-based

Resume Enhancement Loop	Absent	Iterative learning and enhancement loop
Employer Skill Verification	Limited to resumes	Includes certification and test results

3. Requirement gathering for the proposed system

3.1. Introduction to requirement gathering

Requirement gathering is the initial step in system design aimed at understanding the expectations of stakeholders and identifying system functionalities. For SkillBridgeAI, it involves analyzing the needs of job seekers, employers, and administrators to ensure the platform delivers an intelligent, responsive, and scalable solution for employment, skill development, and talent acquisition.

3.2. Functional Requirements

- User Registration and Profile Management
- AI-based Resume Generation and Enhancement
- Job Matching with Match Percentage
- Skill Gap Analysis and Personalized Course Recommendations
- Certification Upload and Verification
- Competency Test Module
- Employer Job Posting and Candidate Shortlisting

3.3. Non-Functional Requirements

- High system availability and reliability
- Fast response time for user queries and AI outputs
- Scalable architecture to handle growing users and data
- Secure authentication and data privacy compliance
- User-friendly and responsive interface
- Integration with third-party course providers and API.

3.4. Hardware, Software, Technology, and Tools Utilized

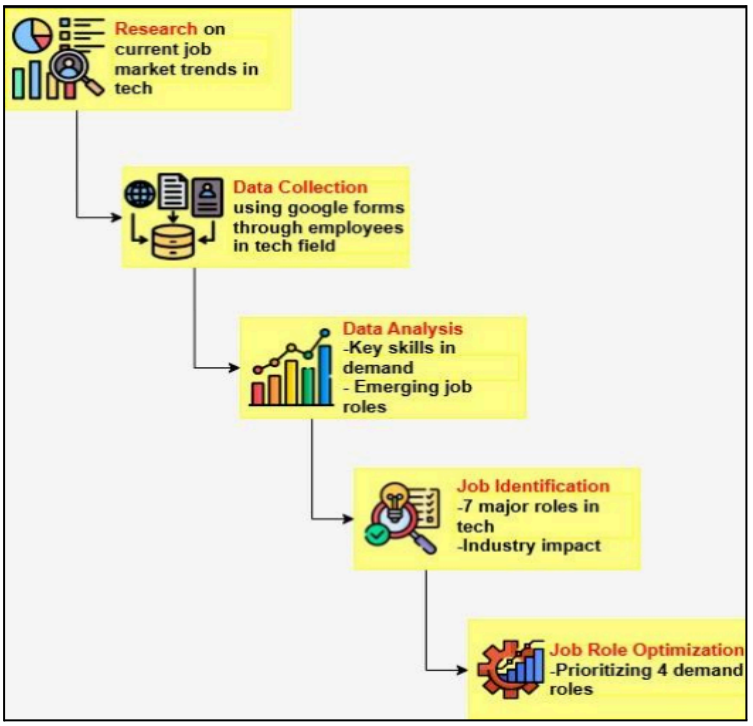
- Hardware: Standard computing device with internet access
- Frontend: React.js
- Backend: Node.js
- AI/ML: Python, Scikit-learn, Pandas, Natural Language Processing (NLP)
- Database: Firebase
- Tools: GitHub, Postman, Figma (UI/UX), Docker (optional for deployment)

3.5.Constraints

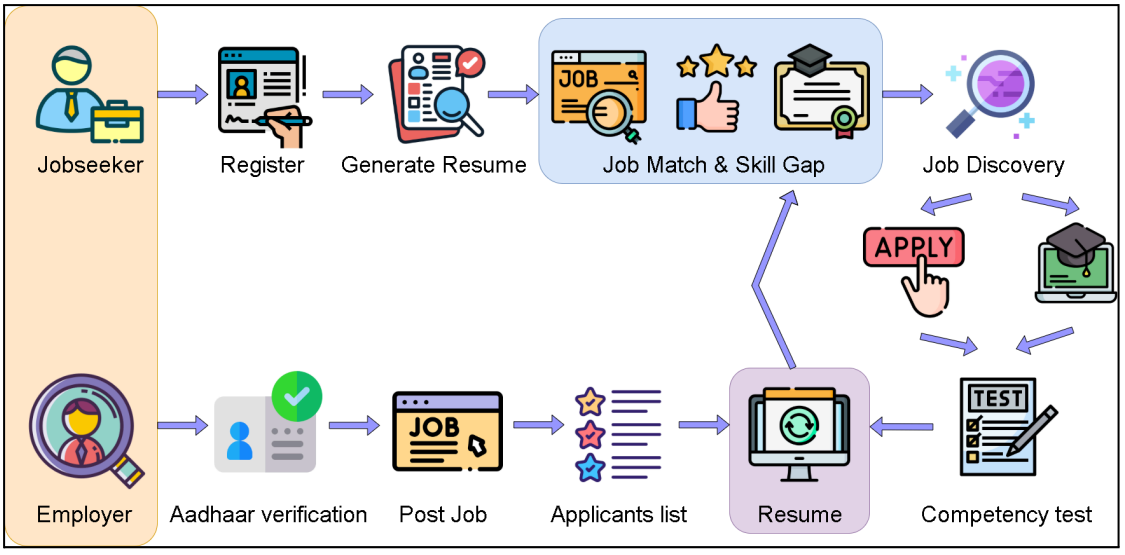
- Limited labeled training data for skill gap analysis
- Real-time integration of certification verification may face delays
- Users may input incomplete or inconsistent data, affecting AI accuracy
- Accessibility issues for users in low-connectivity regions
- Dependence on external course APIs for recommendation accuracy

4. Proposed Design

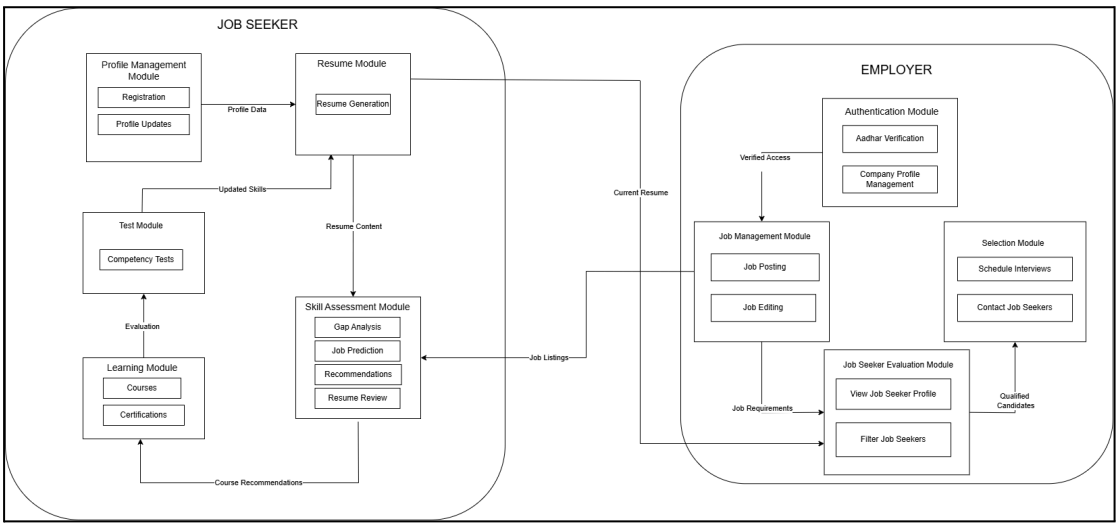
4.1.Workflow Diagram



4.2.Userflow diagram



4.3.Modular Diagram of the system



5.Implementation of the Proposed System

SkillBridgeAI adopts a structured and AI-driven approach to bridge the gap between jobseekers and employers. The platform methodology can be broken down into two major user roles — Jobseekers and Employers — each with specific workflows, all interconnected to achieve a seamless recruitment and upskilling process.

Jobseeker Flow

In SkillBridgeAI, jobseekers begin by registering on the platform, providing personal, educational, and professional details, followed by authentication for security. The system then auto-generates a professional-quality resume, enhanced by AI suggestions for better formatting and keyword optimization. Using machine learning, the resume is analyzed for skills, experience, and qualifications to match candidates with suitable job openings and identify skill gaps. Based on these insights, users can discover personalized job recommendations and are encouraged to upskill if needed. To validate their expertise, jobseekers can take AI-driven competency tests, with results boosting their profiles. Finally, candidates apply for jobs directly through the portal, ensuring higher chances of success by targeting roles aligned with their verified skills and competencies.

Employer Flow

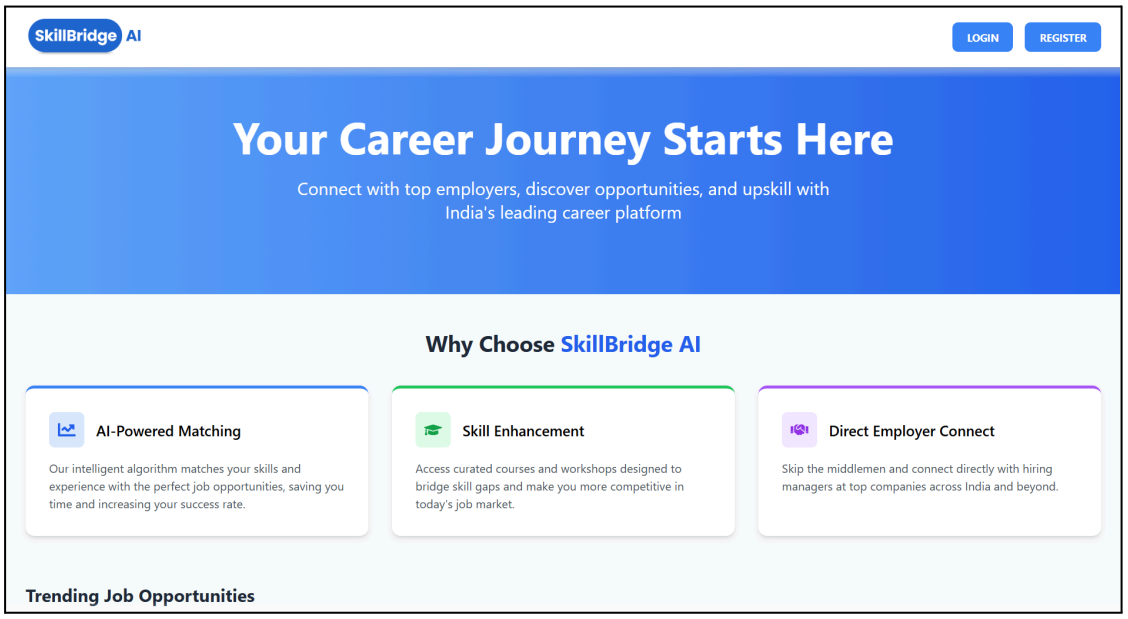
On SkillBridgeAI, employers begin by registering on the platform and completing Aadhaar-based identity verification to ensure authenticity and trust. Once verified, they can post detailed job listings, specifying role descriptions, skills, qualifications, and experience requirements. Each listing is indexed for efficient AI-driven candidate matching. When applications are received, the system automatically generates a curated list of applicants

ranked by job match percentage and competency test results. Employers can then review enriched resumes, which include verified skills and test outcomes, allowing for faster, data-driven evaluation and streamlined hiring decisions.

Continuous Learning and Improvement:

SkillBridgeAI employs dynamic feedback loops where job seekers receive real-time suggestions to enhance their profiles, resumes, and skill sets after each application, while employers receive guidance to improve job descriptions for better targeting. The platform also provides personalized upskilling recommendations, offering online courses and certifications tailored to bridge identified skill gaps. Continuously evolving, SkillBridgeAI leverages data from user interactions, hiring patterns, and market trends to refine its AI algorithms, ensuring smarter matching, improved recommendations, and an adaptive, future-ready employment ecosystem.

6. Results



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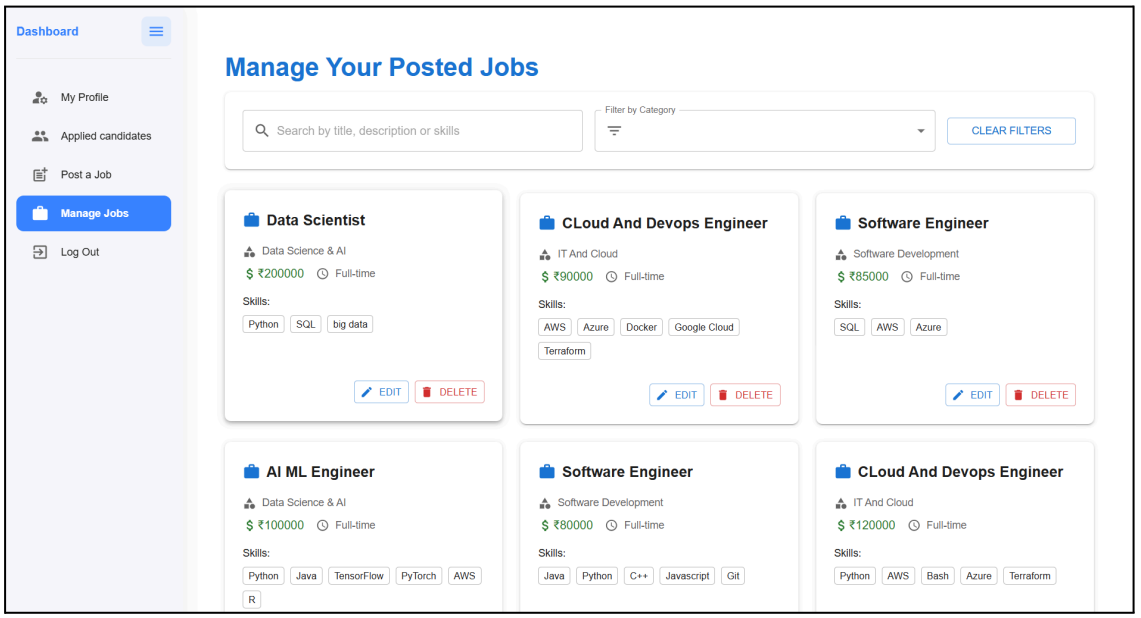

7. Conclusion

7.1. Limitations

While SkillBridgeAI offers an integrated and intelligent approach to job matching and upskilling, it has certain limitations. The platform's effectiveness largely depends on the accuracy and completeness of user-provided information, such as resumes and certifications. Additionally, real-time validation of third-party course completions and certifications can be challenging due to varying data standards and limited API access.

7.2. Conclusion

SkillBridgeAI successfully bridges the gap between job seekers and employers through an AI-driven platform that offers resume generation, skill gap analysis, personalized course recommendations, and competency assessments. By creating a continuous feedback loop and enhancing candidate profiles dynamically, the system promotes adaptive learning and better job alignment. The project demonstrates how AI can be effectively leveraged to streamline hiring and upskilling in a unified ecosystem.

7.3. Future Scope

The future scope of SkillBridgeAI includes expanding its capabilities to support a more diverse and global user base. This can be achieved by incorporating multilingual support and regional job market insights to enhance accessibility and relevance. Integration with a wider range of online learning platforms and certification bodies will allow for more comprehensive upskilling pathways. Advanced AI techniques, such as deep learning and semantic analysis, can be implemented to improve the accuracy of job matching and skill gap detection.

References

[1] D. Lee, "Artificial intelligence based career matching," Proc. 2018 Int. Conf. Inf. Commun. Technol. Convergence (ICTC), Jeju, South Korea, 2018.

[2] A. Alharbi and M. St. John, "A Machine Learning Approach to Career Guidance and Recommendation System," Proc. 2020 6th Int. Conf. Inf. Manage. (ICIM), London, United Kingdom, 2020.

[3] S. Kumar, P. K. Singh, and A. K. Kar, "AI-based career recommendation systems: A systematic review and research agenda," Expert Systems with Applications, vol. 186, Dec. 2021.

[4]C. Ofoegbu, E. H. Mgbeokwere, and J. O. Ogar, "Resume Optimization Model Using Machine Learning Techniques," Proc. 2023 Int. Conf. Intell. Comput. Commun. (ICICC), Lagos, Nigeria, 2023.

[5] Y. Rosen, M. Rushkin, A. Ang, R. Feder, D. Tingley, and G. Blink, "The Effects of Adaptive Learning in a Massive Open Online Course on Learners' Skill Development," Proc. 5th Annu. ACM Conf. Learn. Scale (L@S '18), London, United Kingdom, 2018.

[6]J. W. Boudreau and P. M. Ramstad, "Beyond HR: The New Science of Human Capital," Human Resource Management, vol. 46, no. 2, pp. 165–173, Summer 2007.

[7] H. K. Akmaz, S. A. Öztürk, and M. K. Akmaz, "A Machine Learning Approach for Career Path Recommendation Systems," Journal of Computer and Education Research, vol. 8, no. 16, pp. 672-691, Dec. 2020.

[8] M. Xu, W. Liu, and F. Chen, "A Deep Reinforcement Learning Approach for Personalized Career Path Recommendation," Proc. 30th ACM Int. Conf. Multimed. (MM '22), Lisbon, Portugal, 2022.

[9] S. Hyysalo, J. Lavonen, and H. Salmi, "Artificial Intelligence for Career Guidance – Current Requirements and Prospects for the Future," IAFOR Journal of Education, vol. 9, no. 4, pp. 7–22, 2021.

[10] T. Schlippe and K. Bothmer, "Skill Scanner: An AI-Based Recommendation System for Employers, Job Seekers, and Educational Institutions," Int. J. Adv. Corp. Learn. (iJAC), vol. 16, no. 1, pp. 4–12, 2023.