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A review on Hirepilot: Revolutionizing recruitment with agentic AI

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Abstract: *One of the most important aspects to form a good team with talent and skills is the process of recruitment and recruiting the right candidate which fulfils his role. Thus, the traditional recruitment process is often time consuming and lean towards making biased decisions, hence whenever the hiring is on the large scale it becomes difficult to maintain authenticity and efficiency of the recruitment. Hence* ***HirePilot*** *is the solution which aids the recruiters to make better decisions by using newest Large Language Models (LLMs), Natural Language Processing, and Agentic AI, which leads to find right candidates to fill a position while analysing their resumes and even carry out the interview process. It gives a comprehensive summary of the candidate which helps recruiters to make better and efficient decisions.*

Key Words: *Artificial Intelligence, Natural Language Processing, Human Resource Management, Recruitment, Applicant Tracking System, Algorithmic Bias, Machine Learning.*

1. INTRODUCTION:

Human Resource Management (HRM) is a crucial phase which deals with identifying, developing, acquiring and attracting talent (candidates) to drive organisational success. Though the traditional recruitment is straining in the current era. Recruitments which include manual resume screening, interview scheduling, manual mailing and assessments are lengthy and time consuming, often tend to high-cost consumptions. These practices are not only time consuming but also unproductive and inefficient in large scale recruitment, along with that they are also influenced by human subjective and unconscious bias that can hamper the selection of the other talents which are better fit for the role, this leads towards a negative impact on overall recruitment process and diversity.[4]

Along with the arrival of **Fourth Industrial Revolution (Industry 4.0)** a paradigm is introduced in HRM where Artificial Intelligence integrated, and its subfields, "Natural Language Processing", "Agentic AI" are used to form a transformative solution.[1] Hence Artificial Intelligence(AI) integrated solutions assume that the tasks are automated, there is improved decision making and the overall recruitment lifecycle is accurate, efficient and lesser influenced by human intervention.[2] With the help of new age LLMs and AI technologies, automated resume screening, powering conversational chatbots and generating summarized reports of the candidates leads to make the faster, authenticated and efficient decisions. Helping the recruiters.[7]

This paper aims to combine all the findings which we have found through from the recent studies on the application of Artificial Intelligence and its sub-fields on recruitment process. The paper will first outline the fundamental problems which are identified in traditional and early-digital hiring processes. It will then discover the innovative 'AI-powered' solutions suggested to address the gaps, aiming on their mechanisms and progresses. Finally it will inspect the current limitations and major challenges, like algorithmic bias and ethical concerns that complement the acceptance of these technologies, concluding with a viewpoint on the future of AI-augmented recruitment.

2. IDENTIFIED PROBLEMS IN RECRUITMENT:

A. Inadequacy and High Volume: The most crucial and observed challenge is the inefficiency in processing high volume of job applications manually. Traditional recruitment is not only time consuming but also resource exhaustive and prone to human error, due to which skilled applicants might get unintentionally unnoticed. These inefficiencies lead to higher expenses and may lead to slow recruitment process.[4]

B. Human Bias and subjective decisions: Traditional hiring is fundamentally subjective and more often lean towards the unconscious biases, such as heritage, gender, or background.[4] They are sometimes biased towards referrals as well. Which certainly makes unfair for the deserving and talented applicants and this disorganises the flow of the recruitment process.

C. Poor Candidate Experience: Recruitment process is the first phase of interaction between a applicant and organization. Hence lack of communication, slower response time and an inefficient and impersonal recruitment process leads to an undesirable and poor candidate experience. Due to which the brand value of employer gets damaged and this prevents top talents from chasing the opportunities which are given from the employers in the near future [2], affecting the attraction of the better talent towards the organization and hence new talent with innovative thinking which can be a profitable asset for the organization might get missed by the employer, leading towards the negative impact on the business.

D. Ambiguity and Unclear Requirements:

Job Descriptions (JD's) which are not definite, lengthy or complex more often lead to rare and less appropriate candidate responses and lengthy JD's sometimes lead to unclear requirement analysis for the candidate. Also manually crafting this JD's is hectic and often time consuming, inefficient, burdening and sometimes draining for hiring managers.[1] Impacting both recruiters and applicant.

E. Challenges of Virtual Interviews:

With the rise of Industry 4.0 recruiters have accepted the mode of virtual interviews, yet there is a bigger problem. With the new age technology there are new challenges. Recruiters finds it challenging to detect and evaluate non-verbal indications like facial expressions, body language, confidence in the speech and overall performance over a screen that may make the holistic evaluation of a candidate challenging [5], thus impacts the overall evaluation and decision on the virtual mode.

3. AI-POWERED SOLUTIONS AND IMPROVEMENTS:

A. Advanced Applicant Tracking Systems (ATS): Manual Resume screening is often time consuming and hectic along with that it is not convenient to use the manual screening for large batch of recruitment. Hence with the new age technology, recruitment process has introduced an AI powered tool known as Applicant Tracking System, these platforms are developed beyond simple databases, it is an intelligent screening tool which uses "Natural Language Processing" and "K-Nearest Neighbour (KNN)" algorithm, ATS systems can automatically analyse unstructured data from resumes and cover letters into structured layout. These systems examine skills, experience and knowledge from Job Description and resume and matches both of them by using the KNN, this identified matches from resume to job requirements are used to rank the candidate, based on requirements, which significantly improves the productivity in recruitment. [6]

B. Intelligent Analysis of Job Descriptions: To minimize the subjective and bias from the recruitment, studies suggests to use advance Natural Language Models like BERT (Bidirectional Encoder Representations from Transformers) or can rely on using LLM models like Gemini Flash 2.5, OpenAI 4.0, Groq, etc, to deconstruct the JD's and analysing them properly to automatically form a personalized, objective questionnaires, by detecting hidden patterns and visual necessities for the requirements mentioned in the JD's, this helps in creating uniform standards, dropping chances for subjective analysis which can be seen in manual screening and ensures that applicants are evaluated on the basis of what really matters for the role. [1]

C. AI-Powered Virtual Interview Analysis:

To resolve the issues regarding remote interviews, with the rise of industry 4.0 researchers have developed a system/model which can analyse the recorded audio and video, giving objective insights, which resolves the challenges with non-verbal evaluation in interview process. Frameworks such as Facebook's Deepface can be used for sentiment analysis of facial expressions which can be used for sentiment analysis of facial expressions which mainly categorises the expressions into categories such as calm angry, happy or surprised, also models like "Multi-Layered Perceptron (MLP)" classifiers analyses the audio features from the speech to detect the sentiments of speaker.[5] The output generated from the model offers a graphical report on candidate's confidence and emotional state levels throughout the interviews, which offers data driven clues that might chats, thus provides a comprehensive solution for the challenges

of non-verbal evaluation leading to a better and conclusive summary of the candidate's speech, confidence and communication skills, aiding to the recruiters to make more accurate decisions in remote interviews.[5]

D. Conversational AI for Candidate Engagement:

AI integrated chatbots can be utilized to improve candidate engagement and interaction experience in recruitment process, we can use Natural Language Process or LLM as backend and making the chatbots more powerful towards comprehensive discussions and more accurate results.[1] Theses chatbots can function 24/7 and can address any query mentioned by candidates anytime and anywhere. This can be used for initial updates to the candidates through mails or any source of contact given from applicant and can handle interview scheduling, reducing efforts of the recruiters. This automation not only ensures efficiency but also maintains a continuous communication, timely updates to the candidates which was lacking in traditional recruitment process. Thus, leading to efficient communication and higher satisfaction rates and a stronger employer brand. Which attracts fine talent towards the employers and aids to business itself.[1]

4. CURRENT LIMITATIONS AND CHALLENGES:

A. Algorithmic Bias:

The most crucial challenge of AI integrated smart recruitment system is preventing systems from preserving bias decisions made by humans in past recruitments. For e.g. If an AI model is trained on a historical data which includes biased decisions which were made due unintentional subjective human interventions due to this the AI model will learn those past discriminatory practices (for e.g. favouring female candidates over male) and will reproduce these biases and will lead to biased results, becoming an aid to biased recruitment decisions. This may create a cycle of discrimination poses significant legal and ethical risk.[2]

B. Lack of Transparency "The Black Box Problem":

Most of the advanced LLMs such as Gemini, OpenAI which are used in backend operates similar to 'Black Box', their internal decision-making process is not visible leading to lack of transparency and accountability same as black box which is why it is called as Black Box problem, this makes difficult for HR's to understand the reasons why a particular candidate was selected or rejected, which leads to lack of trusting on the output and summary generated from the system.[4]

C. Data Dependency and Quality:

The performance of an AI system is highly dependent on the quality and quantity of the data used to train the particular model. Uneven, incomplete and incompetent data from resumes, CV's and Job descriptions can lead to poor performance and incorrect candidate matches. Thus, data scarcity for specialized roles further complicates the training of robust models.[2]

D. Technical, Financial, and Integration Hurdles:

Implementing a system integrated with advance LLMs and AI system in backend involves a significant amount of computational power, financial investments and technical expertise, which can become a significant barrier, primarily for medium-sized and small-scale enterprises. Also integrating new AI tools and recruitment system while maintaining existing HR infrastructure presents a major compatibility and data transmission challenges.[2]

E. Privacy and Ethical Concerns:

As AI-driven system involves collecting and analysing large amount of personal information gathers from resumes and CV's this may lead to serious privacy concerns and may demand a strict adhere towards data authentication and authorization factors, and making system secure and lesser prone towards not losing or sharing this data without the authority of the concerned body. Organizations must be transparent about how this data is supposed to used and gain a proper consent and ensure its security to maintain trust between organizations, authorities and user's system must adhere to the norms, rules and regulations from the authorities regarding data usage and sharing.[8]

5. CONCLUSION:

The integration of Artificial Intelligence along with its subfields such as Natural Language Processing and Agentic AI leads to a better solution, making it feasible solution for the challenges faced in traditional hiring and aids Human Resource Management to reduce time and cost on the manual efforts by using automated techniques.[1] Automated AI-Powered techniques such as advance applicant tracking systems tends to reduce the efforts which were utilized in manual screening, intelligent interview analysis, AI- driven Job description analysis, Intelligent chatbots, offers convincing solutions which reduces time, efforts, volume, cost and poor candidate experience.[6]

Although the technological shift must be traversed with caution. With the AI- powered aids there are some limitations to those aids, algorithmic bias, lack of transparency (black box problem), depending on data, privacy concerns and most important factors are technical, financial and limitations in integration. These challenges must be addressed through

responsible development and rigorous auditing.[4]The goal should be never be to replace Human Resource Management but to aid the traditional HRM methods to reduce time, efforts and manual labour and help in making accurate efficient and authentic decisions in recruitment process. The collaborative working in recruitment must reduce biased and subjective decisions made in the traditional hiring process and must show unwavering fairness, transparency and ethical principles ensuring that the rightful and deserving candidates will only be selected in the recruitment process, which leads to unblocking the true potential towards creating a more efficient and equitable hiring world.

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