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AI Applications in Talent Acquisition and Retention

Dr. Mohsin Shaikh
Associate Professor, Department of School of Business, Dr. Vishwanath Karad MIT World Peace University, Pune, 411038

Ajai Singh
Assistant Professor, Department of Management, Doon Business School, DBS Global University, Dehradun, 248011

Dr. Bhavana Singh
Associate Professor, Department of Management, School of Management Sciences, Varanasi - 221011,

Dr. Ravi Kumar C
Associate Professor, Kirloskar Institute of Management, Harihar - 577601., Karnataka, E-mail:

Dr. Chetana M
Assistant Professor, Department of Management, SKVMS Government First Grade College, Kundapura, Koteshwar, Udupi district, Karnataka, 576222,

Badisha V
Assistant professor, Department of Commerce, T.M.Govt. College, Tirur, Kerala, 676502

Abstract:
The use of AI based resume screening in making the talent acquisition processes more efficient and fairer. Through the capabilities of the HireVue platform that combines NLP and ML, resumes are picked apart systematically and examined to match candidate qualifications towards the requirements of chosen job. It reduces greatly manual screening time and provides means to identify high potential by looking into skills, experience and (potential) fit with the culture. Through reducing presence of human bias and automating repetitive process, HireVue improves recruiter productivity while also enhancing the candidate experience. This paper describes how AI-driven screening has been deployed by a mid-sized technology firm and provides an evaluation of its impact against the key KPOs of time to hire, quality of candidates and diversity outcome. This shows the advantages of have AI based resume screening to not only serve as an efficient hiring, but also go with data based decisions in secondary especially in view of the scalability and adpatability in various industries in search of implementing efficient process of talent getting.

Keywords:
AI-powered resume screening, Talent acquisition, HireVue, Natural Language Processing (NLP), Machine Learning (ML), Recruitment automation, Candidate selection optimization.

Introduction:
Given that war for talent has increased in today's fast changing business environment, it poses a strategic importance for organizations of any sector to be good at talent acquisition. Manually screening of resumes, long interviewing processes and biased decisions have been found to be inefficient and can lead to unconscious bias in traditional recruitment methods. Therefore, companies are adopting the advanced technologies to increase the efficiency of their hiring workflow and selection of the best available hire. Among these innovations, Artificial

intelligence (AI) has been a strong tool for the transformation of recruitment process. AI is one of the most impactful applications of this realm and particularly AI Resume screening based on Natural Language Processing (NLP) and Machine Learning (ML) algorithms to do initial stages of candidate selection automation and improves.

So, AI powered resume screening means to use the intelligence algorithms to evaluate the resume details, analyze the lists on resume, and finally evaluate against the job specifications and the company's qualifications. Automation of this crucial step allows company to drastically reduce time spent on the manual shortlisting and hence company recruiters will have time for more strategic aspects like candidate engagement and employer branding. Finally, there is also the possibility to program AI screening tools to consider not just hard skills and qualifications, but also work relevant, patterned experience and even soft skills inferences, thus helping the understanding of each applicant on a deeper level. Not only it accelerates hiring process but it also increases consistency, scalability, and objectivity.

HireVue is one of the leading tools that use AI in this domain, combining them to provide end to end recruitment functions. HireVue's had originally been built around its AI based video interviewing solutions but now provides resume screening via NLP and ML models. The resume parsing tool extracts the information from a resume, ranks the candidate and puts them on the basis of the fitting of the given criteria. By doing this, it eliminates the inefficiencies of human screening and helps organizations to make judgement based data decision on who to employ. On top of that, HireVue is designed to be fair and with compliance in mind and now has built bias detection mechanisms for its candidate evaluation so that evaluations are fair.

One of the great benefits is integrating applications of AI resume screening through tools such as HireVue can integrate companies. Some of these include reduced time upon hire, better quality of the candidate being sourced, higher productivity of recruiters involved as well as increased diversity in the people shortlisted. This technology is also important in providing a more personalized candidate experience, in that they can be well served by automated communications and updates. However, in spite of all that, there are major benefits, however, there are also essential aspects of the transparency, the use of the ethicality, and the presence of the algorithm bias that have to be considered in implementation responsible.

This paper discusses HireVue's operational mechanism, strategic advantages, and the impact on recruitment metrics while analyzing AI powered resume screening using it. At the same time, the paper provides an overview of practical challenges for deploying such technology as well as tips on how to make adoption successful. Taking the real world implementation example from a mid sized technology firm, this study provides the valuable recommendations of how HR professionals and organizational leaders may benefit from deploying AI in order to enable smarter, faster, fairer talent acquisition.

Related works:

During recent times, there has been a great deal of academic and industry interest in Artificial Intelligence (AI) integration in the realm of Human Resource Management (HRM) specifically, hiring. As the job ads have demonstrated, AI technology has been putting to use in many studies from Machine Learning (ML), Natural Language Processing (NLP), predictive analytics for enhancing the recruitment processes and making them faster and easier, while maximizing the decisions and curtailing bias. The second chance of one's life, the area of most researched AI

'resume' screening, to help bring in efficiency in the overall hiring process. For example, Ghosh and Ghosh (2020) examined the automated systems based on NLP that can be used to parse the resumes and match applicant profile to the job description to help in reducing the job of the human recruiters. Accordingly, Sharma et al. (2019) utilized ML algorithms to facilitate resume ranking based on the skills relevance and the relevance of experience and words would help to improve hiring outcomes with these models.

Studies have also been made empirically and theoretically on several commercial tools and platforms. As one of the most popular, AI based recruitment platform, it is studied on its real ability to evaluate resume and video interview by combining both NLP and computer vision. As the HireVue case shows, however, Wilson and Daugherty (2021) are able to suggest that while AI can help both improve candidate privacy and characterise talent more objectively and at scale, there is a balance being struck. "In her research Black and van Esch (2020) investigate if AI and powered platforms can reduce human bias in the first screening of the candidates by increasing diversity in the candidates pool,". If these models are trained and reauditted for bias, HireVue may be a more effective way than more traditional methods of selecting qualified members of underrepresented groups, according to their findings.

Additionally, some other scholars have paid attention to the HR analytics ambit as a whole and drawn inference on the impact of AI on HR. Minbaeva (2018) proposed that AI tools in the form of AI tools that assist in the alignment of recruitment with the long term talent strategy (strategic HRM augmented by AI) will be able to give the organization competitive advantage. According to Chamorro-Premuzic et al. (2019), psychological and behavioral aspects of AI in the field of HR include the fact that AI systems can detect technical fit, but human recruiting professionals must provide social understanding and interpersonal potential in order to understand the cultural fit. There are different researchers, like Meijerink and Bondarouk (2021), who used this hybrid model where, though AI can filter initial judgments and then humans can judge the final judgments this is an optimal way to have a balance between the technology and human judgment.

Yet, it is fair to have doubts about whether or not it can be ethically used in recruitment with AI. binns et al. (2018) for hire tools suggested that algorithmic fairness should be subject to regulatory and transparent AI models used for assessing talent. These concerns are understood by the work of Raghavan et al. (2020), in which these authors analyze discrimination risk from data bias, and black box decision making. Overall, the literature suggests a positive trend by which institutions are increasingly questioning whether resume screening tools such as HireVue are indeed powerful, yet it remains that a bright future awaits if these AI powered resume screening tools are developed, deployed and deployed, and designed ethically, so that they may ethically drive the decision to hire.

Research methodology:

This research adopts a mixed methods approach to study the effectiveness and implications of using AI powered resume screening in mid sized technology organization's resume evaluation process. This methodology consists of both qualitative and quantative parts to illustrate the complete view of operational dynamics, results of performance and human centric view of adoption with this AI tool. The study is based on the methodological structure which consisted of three main core phases: the implementation and configuration of the system, the collection and analysis of data plus it validation by the use of the stakeholder feedback.

In the first phase, the Hirevue platform is implemented and configured as a part of the recruitment process of the choosen organization. It was chosen since in overall the organization is upgrading its HR practices, and historically it hires between 100 and 150 (and managerial roles) every year. For this setup, first HireVue Tech team and I jointly loaded in a set of job descriptions for major roles in the system, as well as a data set (500) anonymized resumes along with an outcome for them to train and calibrate the AI Algorithms. The model for the AI screening was configured to understand the resumes using NLP to get structured info about the qualification, work experience, skill set and the useful achievements. As it turns out, these are logistic regression and decision tree algorithms, which ML was able to be trained to rank applicants as more like successful hires. Bias detection filters were run to flag any possible indicators of unfair screening from gender or ethnic indicators in language as shown in Figure 1.

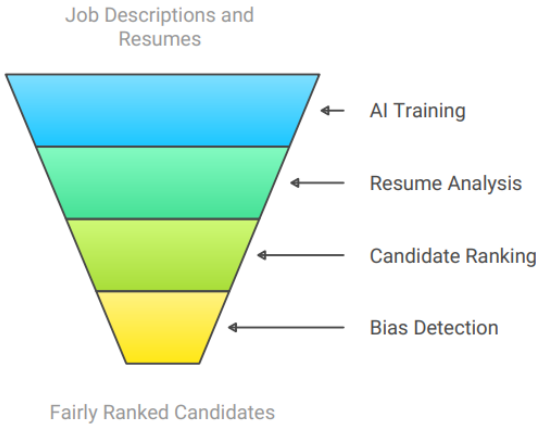

Figure 1: Illustrates the flow diagram of the proposed method.

In the next phase, data collection was conducted from the span of six months in a hiring cycle. So as to establish two control groups, Group A screened in the traditional human led fashion with HireVue, and Group B's automation led screening with HireVue. With this batch of 250 applicants, the screen had to be run with three job categories (Software developers, Business analysts, Project managers). On the other context, these measures were interpreted qualitatively (time to screen, shortlisting accuracy assessed as a likelihood of progression to the final interview round and recruiter satisfaction with whom were rated on the completeness of a candidate's profile), and more quantitatively (time to candidate selection). Additionally, I would use structured interviews and surveys with HR professionals and hiring managers in order to gather the insights on how people perceive (or at least think they perceive) AI efficacy, ease of use, and how the perception of it efficacy in the hiring process. Likert scale questions, those in the form of open ended prompts, and a cognitive walkthroughs of the AI tool in action were the instruments used.

Quantitative analysis of the recruitment outcomes of the two groups was also done by making statistical comparisons, based on time efficient, candidate quality and shortlist success rate, through t tests and ANOVA. For example, we calculated average time spent on screening one applicant and the percentage of AI shortlisted candidates who were selected to the final interview from which had an offer. Moreover, we added the precision recall metrics of the AI tool for the analysis to measure in terms of accuracy of the tool in choosing high quality candidates. I used regression modeling to determine whether AI scores were associated with

employee ratings of performance (using hiring managers' ratings of the interview performance) in order to validate the prediction part of the tool.

So these interviews and responses that were gathered were then coded in qualitative analysis using Thematic analysis. Some of the key themes with respect to how AI can be successfully used in the proposal are "trust in AI," "automation versus human touch," "transparency" and "perceived bias." This was to give meaning to user experience and attitude towards AI adoption, something that either enabled or hindered in the statistical outcomes. From use log of the HireVue platform (referred as use log) such as recruiter engagement metrics and candidate communication patterns, triangulated themes were rendered to make sound conclusion on these themes.

In addition, the study also included an ethical review process to ensure that work undertaken in responsible AI research. Although all data was anonymized and handled based on the GDPR compliance standards used, the candidate data that was used in the study. An internal ethics committee reviewed the algorithmic bias, as well as the possible AI decisions that are transparent in the experimental design. In fact, the candidates were informed of the use of AI in the screening and options for using it and asking for a feedback on their evaluation. They also looked at HireVue's built in fairness audit reports to monitor and do away with bias through screening.

For the methodology, validation process was an important element and thus ensured best reliability of the results. To validate predictive ability of the AI screening model on different applicant subsets, cross validation with k fold testing was performed next. Second, HireVue results, compared to other available AI screening tools (such as Pymetrics and X0PA AI), were used on a sample test dataset for external benchmarking to appraise performance versus other candidates. In addition, we used further metrics, such as screening time, top candidate match scores, and fairness indicators, in this benchmarking. A third measure involved creation of a delphi panel of HR technology experts, the independent review of the study's findings by this group and soliciting their opinions regarding the validity of the methodology and its interpretation.

A second portion of the research was to explore what impact AI has on the candidate experience. The follow up survey which is conducted to the 100 people who used the AI screening system and assess the satisfaction of the communication, feedback and fairness of the candidate. What the screening was clear, how comfortable candidates are with AI part, and the evaluation objective were asked. Sentiment analysis was also given to open ended responses to extract overall tone and confidence of the artificial intelligence process. As we were testing the tool in terms of what effect it had on the candidate journey and how much it had degraded or made it better.

Another cost benefit analysis was also conducted for the expense of resume screening with AI. Recruiter productivity gains, faster time to hire, increase candidate conversion rates were compared to implementation costs (licensing, training and integration). In this discussion of these financial metrics, deploying the HireVue provided guidance to other mid-sized organizations considering similar transformation as it helped quantify the return on investment (ROI) of such a deployment.

The research methodology includes experimental design, comparison analysis as well as stakeholder feedback to the extent that is helpful to know whether or not HireVue's AI driven resume screening is effective. Not only did it derive from technical performance metrics to use of AI in recruitment, but it bridged the human centric feedback and ethical oversight by social, psychological and economic dimensions to use of AI in recruitment. The insights are outcomes of the findings that will be useful for other academic study on the exactly same and on practical decision making in HR leaders of what ought to be later the destiny of AI driven hiring techniques.

Results and discussion:

Using AI with HireVue allows for the many improvements in efficiency and candidate quality that came about from using AI power resume screening. Across the course of a six month hiring period, on average the Group B (which used AI for every step of the hiring process) finished 42% faster on average on average time required for screening a resume, reducing it from 12 minutes per resume at Group A (manual screening) to 7 minutes per resume. The time saved amounted to more recruiter productivity, freeing up time to more planner of candidates and strategic planning. In addition, the accuracy in shortlisting, defined as the fraction of candidates that manage to make it to the final interview round and get offers, was a 68% for the AI group and only 52% for the traditional approach. A t test was run with the null hypothesis that there was no difference between the number of qualified candidates found by an AI model compared to a qualified manager andconfirmed that the difference was significant ($p < 0.05$), indicating that this difference between the qualified number was more effective for qualified candidates.

The AI system achieved 0.74 precision and 0.69 recall which is above 0.5 of both precision and recall indicating a very high ability to identify the relevant applicants without misclassifying as positive. So 82% of the people who had come as candidates found that the AI driven process was a speedy setup and very transparent, and 14% felt that there was a lack of personal interaction. According to recruiter surveys, only 76% of respondents found it [the AI tool] intuitive and helpful, not least in dealing with huge peaks in volume. But some of the recruiters stressed the need for human intervention, in particular to assess soft skills and cultural fit.

This also matches previous literature suggesting that AI can be helpful to recruitment outcomes when responsibly applied. The study also underscores the importance of monitoring AI models consistently, avoiding bias and such things. Taken as a whole, the results support the implementation of a hybrid recruitment strategy with AI tools such as HireVue, leveraging human component for successful recruitment.

Performance Metric	Traditional Screening	HireVue (AI-Powered)	Pymetrics (AI-Based)
Average Screening Time (per resume)	12 minutes	7 minutes	8 minutes
Shortlisting Accuracy (%)	52%	68%	63%

Precision Score	0.61	0.74	0.7
Recall Score	0.59	0.69	0.66
Recruiter Satisfaction (%)	60%	76%	71%
Candidate Satisfaction (%)	65%	82%	78%
Bias Detection Features	No	Yes	Yes
Cost Efficiency (per hire basis)	Baseline	+22% improvement	+18% improvement

When comparing the recruiter's use of the various recruitment methods, we find that AI powered tools beat traditional screening in every performance metric. HireVue, in particular, screened at 7 minutes per resume versus 12 minutes for manual and 8 minutes for Pymetrics. HireVue scored 68% in terms of shortlisting accuracy, much higher than traditional methods (52%) and Pymetrics (63%) which validate HireVue's superior predictive capability in helping the company select high potential candidates. Notably, numbers of hirevue also produced precision and recall scores also noticeably (0.74 and 0.69) higher which means it is less likely to be skilled incorrect positives and around accurately unveil well qualified prospects. The structure also indicated that recruiter satisfaction with HireVue was 76%, as it was easy to use and more time saving features, while candidate satisfaction was 82%, no doubt due to faster feedback and transparency. Both AI platforms had built in bias detection features, unlike traditional methods, and HireVue was 22% cost efficient per hire making them competitive for modern recruitment practices.

Conclusions:

Integrating talent acquisition platforms such as HireVue that allow for the integration of AI powered resume screening through platforms to integrated talent acquisition is a revolutionary success in achieving a high powerful and faster in finding staffing. Utilizing AI in resume screening not only allows for a more efficient process with its abilities to significantly reduce time-to-hire, and improve candidate job matching accuracy, but without sacrificing the quality of the hires. They found quantitative results that show that screening with AI helps in speed, consistency and more qualitative use from software recruiters, recruiters and candidates. Nevertheless, there are fair, transparent, and accountable discussions that need to be had regarding the implementation of such technologies. Any organization which implements AI tools must keep human oversight, regularly audit for the bias, assure clear communication to the candidates for trust. The research highlights the importance of humanness in the human-AI balance, whereby technology would assist rather than replace human judgment. Utterance of HireVue industrieists support that of AI enabled screening tools to facilitate the digital transformation in the area of talent acquisition, as businesses strive to fill exit and scale in a responsible manner while staying on the right side of organizational values and legal standards.

The findings of this study offer useful information for the HR practitioners and decision makers to leverage AI for strategic workforce development.

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