Development of Framework for ACI-Powered Human Resource Recruitment Assistant

Md Jawadur Rahman, Gabriele M. Murry, Stephanie Schmitt-Rüth
OTH Amberg-Weiden, Amberg, Germany

The landscape of human resource management within large enterprises necessitates efficient and unbiased recruitment practices to ensure organisational effectiveness and foster diversity (Ayoko & Fujimoto, 2023). Traditional hiring processes often create biases, which cause additional challenges in achieving proper objectives (Bogen, 2021). According to Workable (workable.com), the average time to fill a job requisition is 41 days (Howden, 2023). This paper proposes a framework for the development and implementation of an Artificially Capable Intelligent (ACI)-powered Human Resource (HR) Assistant for large enterprises (possibly more than 300 employees) to eliminate these unnecessary challenges caused by biases in hiring practices, therefore directly addressing fair and just participation in society and the world of work. The framework integrates ACI technologies, particularly candidate identification, to revolutionise HR practices. By leveraging ACI algorithms, the proposed hyper-realistic assistant aims to revolutionise the recruitment process. It will significantly reduce the average time to fill job requisitions. Moreover, the ACI-powered system is designed to mitigate biases inherent in traditional hiring practices, thus fostering a fair and inclusive environment for all candidates in the shortest possible time frame. This paper includes the key components and working processes of the ACI-powered HR Assistant framework. Through a comprehensive theoretical analysis, the paper investigates the system's working process and how the framework aligns with the goal of promoting a fair and participatory environment in the world of work. Ultimately, the proposed framework represents a main step towards enhancing organisational effectiveness, fostering diversity, and advancing equitable recruitment practices in the futuristic workplace.

Keywords: artificial capable intelligence, human resource

Introduction

Large enterprises usually operate in a paradoxical organisational structure, which requires futuristic human resource management strategies to attract, choose, and retain top talent from the labour market (Baartvedt, 2013). However, traditional hiring processes are mostly occupied by conscious and subconscious biases, which limit diversity and foster inequalities inside the enterprise (Whysall, 2017). By using Artificial Capable Intelligence (ACI) or next generation Artificial Intelligence (AI) technologies in human resource recruiting processes, these challenges can be addressed, and this technology can help to overcome them with a promising outcome. ACI-

powered human resource recruitment assistants can also provide an opportunity to reimagine HR practices in an unbiased and more efficient manner.

Background and Objective

The usage of ACI or next-gen. AI technologies can give a futuristic shift in recruitment practices. These technologies with advanced algorithms, machine learning, and natural language processing help to do candidate identification, assessment, and selection processes. By automating repetitive tasks and augmenting decision-making capabilities, ACI-powered systems have the capability to enhance efficiency, mitigate biases, and optimise the time-to-fill of talent acquisition process.

In this paper, the authors propose a new framework that can help HR practitioners to open a new window of a futuristic hiring process for large enterprises. By using ACI algorithms and methodologies, the framework seeks to address the issues of biases in the hiring process and take preventive action to smooth the traditional hiring practices. Thereby it will foster a fair, inclusive, and efficient recruitment process.

Framework Development

The proposed framework consists of several key components and working processes that are designed to optimise the recruitment life cycle. By building a SaaS (Software as a Service) the whole process of recruitment could be turned into a far more efficient one. The framework proposed is given below:

The authors used Deshmukh's (2020) framework as a starting point, but added more detail in the functionality up to the skill-test phase. From there on the authors built a behaviorally strong interviewing technique conducted by a hyper realistic human agent with consciousness. This framework uses the organisational perspective and aims to ease the recruitment process drastically for recruiters based on the Depersonalization Spectrum (Lambert, Sierra, Phillips, & David, 2002), where the integration of an AI-driven virtual entity resembling human resource personnel, helps with conducting interviews. This AI interface operates in a manner that is designed to initially appoint a non-human identity to engage candidates in dialogues from which it extracts specific data for subsequent AI analysis.

According to the framework, the whole recruitment phase is divided into three sections.

(1) CV/Resume Shortlisting

Implementing an AI-driven shortlisting process can be helpful for the initial phase of candidate selection. Large companies typically spend around six seconds per CV during this phase (Fennell, 2024). However, due to human limitations, it can be challenging for recruiters to thoroughly review each CV, potentially leading to oversight or errors in candidate assessments. AI technology offers a solution by efficiently extracting and analysing information from CVs, thereby reducing the likelihood of overlooking qualified candidates or making subjective judgments. By automating the initial screening process, AI-driven shortlisting enhances accuracy and fairness in candidate evaluation, contributing to more effective and unbiased recruitment outcomes. Various types of Applicant Tracking Systems (ATSs) are already available in the market and work with very specific human input of data/keywords, whereas AI-driven technology can ease the process with minimum supervision.
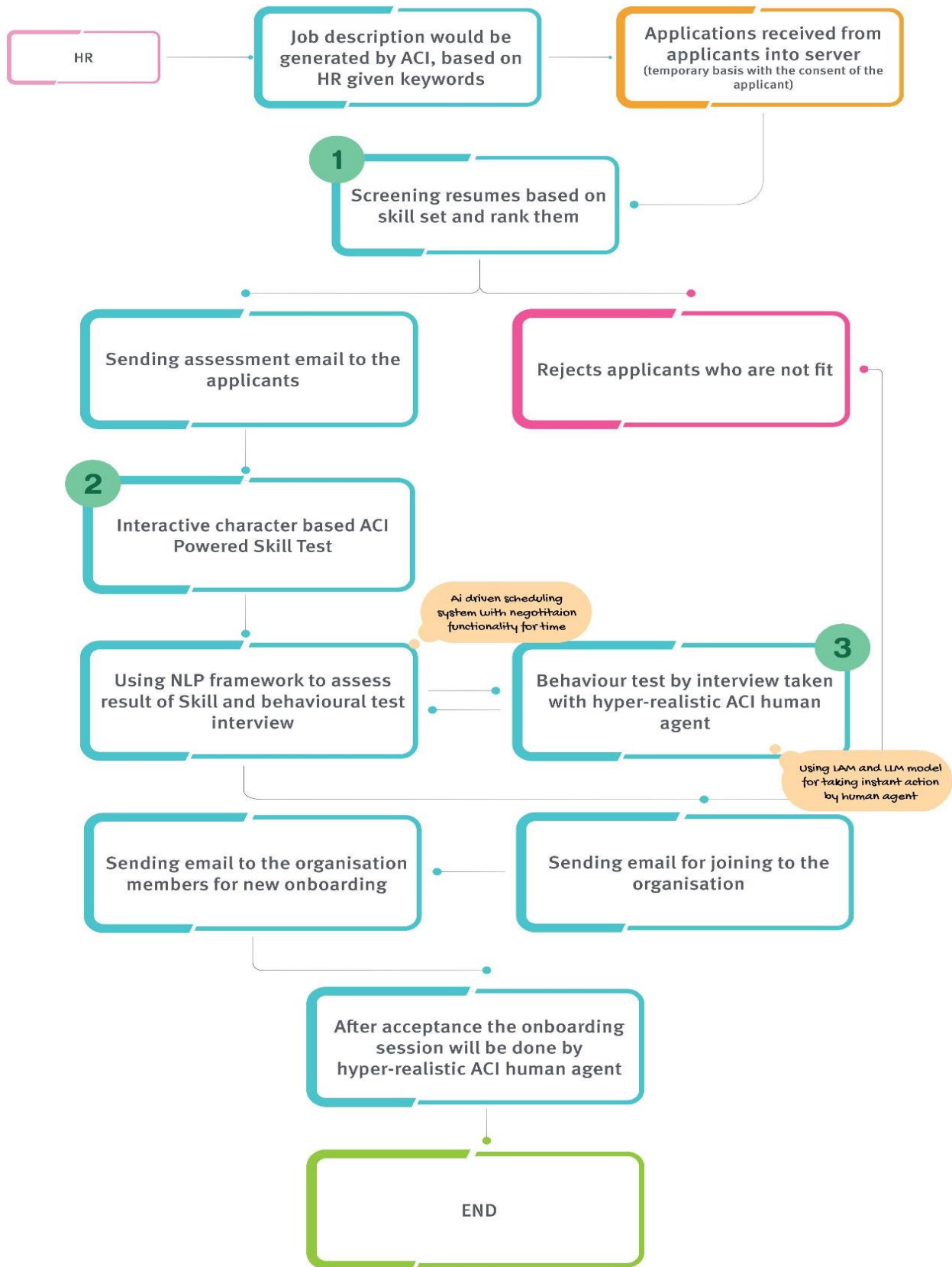
HR

Job description would be generated by ACI, based on HR given keywords

Applications received from applicants into server
(temporary basis with the consent of the applicant)

1 Screening resumes based on skill set and rank them

Sending assessment email to the applicants

Rejects applicants who are not fit

2 Interactive character based ACI Powered Skill Test

Ai driven scheduling system with negotitaion functionality for time

Using NLP framework to assess result of Skill and behavioural test interview

3 Behaviour test by interview taken with hyper-realistic ACI human agent

Using LAM and LLM model for taking instant action by human agent

Sending email to the organisation members for new onboarding

Sending email for joining to the organisation

After acceptance the onboarding session will be done by hyper-realistic ACI human agent

END

Figure 1. ACI-driven HR recruitment process framework.

(2) Skill Test

After the shortlisting process, skill tests can further refine the selection of candidates based on their specific abilities or skills. These tests can include questions, puzzles, or individualised case studies generated by AI technology, based on real-world challenges faced by enterprises. These personalised case studies will be generated by AI and it will synthesise dynamic dialogue processes, which will act more like a chatbot. By assessing candidates' subject-matter and task-specific problem-solving capabilities and aptitude in addressing practical issues, these skill tests assist in identifying individuals with the prerequisite skills for the position. Integrating AI-generated scenarios into skill assessments ensures that candidates are evaluated on their ability to tackle relevant challenges, thereby helping large enterprises in finding the most suitable candidates for the role.

(3) Behaviourally Anchored Interviewing

The behavioural interview phase will be done through Artificial Capable Intelligence (ACI). It conducts interviews with a human-looking AI recruiter, which was built based on the behaviour of a real recruiter. This recruiter's mannerisms, expressions, and behaviour are adapted by the AI recruiter and are used during the interviews with potential candidates. As ACI technologies have "behavioural super-intelligence", therefore its cognition, desires, and beliefs are better than that of artificial general intelligence (AGI) (Mucci & Striker, 2023). ACI can evaluate candidates' behavioural attributes, such as communication and reflection based on past problem-solving experiences, through individualised questioning and analysis of responses. By leveraging natural language processing (NLP) and machine learning, ACI ensures objectivity and consistency in assessment, minimising biases. Using the Large Action Model (LAM), the AI recruiter can take actions in response to candidates' questions, such as showing the enterprise's profile or providing specific information in the feedback phase. By using an auto-regressive language model, the architecture of the interview process could be optimised in terms of redirecting the interview topic back to the predominant aim of questions. After the pre-training data, the tuned versions can be used to supervise fine-tuning (SFT) of the whole dataset and knowledge base of the ACI-powered human agent and reinforcement learning by human feedback (RLHF). SFT can align with human preferences for helpfulness and safety and also by taking input from regular interviews to further improve and learn from regular human behaviour displayed during the interviews. Language Understanding Models (LUMs) can be used to help to understand speech to the text. Vision Language Models (VLM) could be used to understand candidates' behaviour. The data collected from the interviewed candidate help to evaluate the candidate. At the end, ACI should make hiring decisions aligned with organisational needs and culture.

Figure 2. Recruitment phase based on ACI-driven HR recruitment process framework (Figure 1).
Note: illustrations by own.

Opportunity in the Market

A notable amount of recruiters, 42% are positive about AI-based recruitment processes (University of Sussex Business School, 2021), which entails only a small fraction of our proposed framework. After the COVID-19 pandemic, virtual recruitment strategies have emerged as the main components of organisational recruitment strategies. As most of the companies and candidates feel it is not only time-consuming, but also less sustainable to travel from one place to another for just an interview, most first-stage interviews moved into the virtual domain; according to Gartner (2022), 86% of companies have transitioned to online interview formats to counteract labour shortages. In total, 67% of companies adjusted and invested in virtual interview technologies to make the recruitment process smoother in 2022 (Rajnerowicz, 2024; Magan, 2023). The amount of companies to invest in virtual interviewing is expected to increase to 73% within 2025. Empirical research shows that a significant majority (78%) of Talent Acquisition and HR leaders express positivity with the integration of deployed recruitment technologies (Sengupta, 2023).

Prerequisites for the SaaS model

As the whole work process could be implemented as a SaaS model, conducting a thorough analysis of organisational requirements, hiring challenges, and diversity objectives is mandatory before starting the process. After conducting the analysis, those pre-processing diverse datasets needed to be used to train ACI algorithms to ensure fairness, and inclusivity in candidate evaluation and selection processes. The fine-tuned ACI algorithms can be used for candidate identification, assessment, and matching. It can help to leverage machine learning techniques to predict candidate suitability and performance in the enterprise. The most important part is to prioritise ethical principles, privacy, and transparency in the design and implementation of the whole ACI-powered recruitment systems.

Recommendation

In implementing an ACI-powered recruiting SaaS model, recruiters should prioritise predefined communication with prospective applicants to address any mistrust or doubts they may face. This communication strategy should have transparent explanations about the usage of the recruitment software and also its purpose, data protection measures, and compliance with GDPR (General Data Protection Regulation) regulations. Moreover, it is important to assign a dedicated contact person within the recruiting team to assist applicants (if needed) throughout the recruitment journey. This personalised support gives a sense of connection and trust. It will create emotions, values, and mutual respect. Maintaining a human touch ensures a positive and inclusive recruitment experience for the candidates.

Conclusion

The proposed framework presents a significant step towards using ACI or next generation AI for recruitment practices. By using the power of ACI algorithms, enterprises can hire entry level potential employees in a diverse way. However, successful implementation of the process requires interdisciplinary collaboration and research, stakeholder engagement, and ethical considerations to ensure alignment with organisational values.

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