



September 1, 2022

Introducing hireEZ's **Ethical AI** for Recruiting

**Summary Report of Artificial
Intelligence Bias and Fairness Auditing
for hireEZ**

—By ML Research and Consulting

Table of Contents

Table of Contents	1
Introduction	2
Audit Standard and Methodology	3
Summary of hireEZ's Audit Result	5
In Closing	7
About ML Research and Consulting	8

Introduction

hireEZ is a technology company that provides a **web-based candidate sourcing tool** to make outbound recruiting easy for employers. As of June 2022, it sources across 45+ platforms and 800M+ professional profiles. It collects potential candidates' email addresses and phone numbers, aggregates and cross-references all of a candidate's online profiles, converts any job description into a structured format, and enables recruiters to operate efficiently with team collaboration, pipeline management, and intelligent engagement. **hireEZ aims to make it easy for recruiters to search for candidates, improving the efficiency of the job market and contributing to the economy.**

45+
platforms

800M+
professional profiles

hireEZ's product does not provide any artificial intelligence (AI)-driven decisions at any stage of the hiring process, as their main function and advantage is the collection of a huge number of candidate profiles, which is stored online and easy to retrieve. Though hireEZ does use some AI technologies, like natural language processing, for data preparation and organization. AI technologies have been advancing rapidly in the past decades and have become the driving force of our economy. As a technology-driven and research-oriented company, hireEZ benefits from AI technologies and is also fully aware of the potential risk in using some AI technologies, which may arise from particular datasets, algorithms, user interaction, etc. **hireEZ is committed to the highest standard of AI governance.** Being trusted and trustworthy is critical to hireEZ's mission to help people improve their job opportunities and help recruiters find needed talents.

To assure the best AI governance practices, detect/mitigate any potential AI risks, and comply with regulations and highest expectation of AI fairness, hireEZ contracted with ML Research and Consulting, an independent AI firm, to **conduct a thorough AI audit**, which took about 6 months in 2022.

Audit Standard and Methodology

AI governance refers to how AI is managed in an organizational context. Incorrect usage of AI can expose an organization to operational, financial, regulatory, and reputational risks, and is unlikely to be aligned with an organization's core values. The unique nature of AI requires guardrails to be put in place to ensure that AI works as intended. That's the key mandate for AI governance. The audit adopts the guidelines from References [1] and [2] below, which conform to GDPR and CCPA, and adheres to the following AI principles:

Accountability and Governance

The Accountability and Governance principle ensures responsibility for complying with data protection and for demonstrating that compliance in any AI system. In addition, for any AI system, it is required to assess and mitigate its risks, and document and demonstrate how the system is compliant and justify the choices made in the process. If there is dependency involved in an AI supply chain, it is required to understand and identify controller/processor relationships and their responsibility to ensure accountability and traceability.

AI governance and risk management cannot be delegated to data scientists or engineering teams. Senior management are accountable for understanding and addressing them appropriately and promptly. Diverse, well-resourced, teams are needed to support them in discharging their responsibilities. Internal structures, roles and responsibilities maps, training requirements, policies, and incentives, should be aligned with the overall AI governance and risk management strategy. Governance and risk management capabilities need to be proportionate to the use of AI and even at the initial stages of AI adoption.

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- 1 UK Information Commissioner's Office. "Guidance on the AI auditing framework Draft guidance for consultation." 2020. Available at: <https://ico.org.uk/media/2617219/guidance-on-the-ai-auditing-framework-draft-for-consultation.pdf>
 - 2 Raji, Inioluwa Deborah, et al. "Closing the AI accountability gap: Defining an end-to-end framework for internal algorithmic auditing." Proceedings of the 2020 conference on fairness, accountability, and transparency. 2020.

Audit Standard and Methodology

Lawfulness, Fairness, and Transparency

- **AI lawfulness** states that the development, deployment, and use of AI systems should have a legal basis and be compliant with any applicable legal regulations.
- **AI fairness** requires the fair treatment of subpopulations of users of products involving automation, and ensuring that users are fully aware of the processing to make an informed decision, so that such products may not perpetuate any harmful biases or discriminate against certain groups.
- **Transparency** means open access to the details of the functionality of an AI product, which can be achieved through documentation practices as well as interpretability and exploitability methods.

Security, Data Minimization and Purpose Limitation

As the standard practices for developing and deploying AI involve processing large amounts of data, appropriate security measures should be: adopt data minimization practices, decrease the potential for loss or misuse of the large amounts of personal data often required to train AI systems, and decrease the potential for software vulnerabilities to be introduced as a result of the introduction of new AI-related code and infrastructure. Personal data will only be collected and processed to accomplish the specific, explicit, and legitimate purposes and will not extend beyond the purposes contemplated, and users will only use such data for limited purposes.

Individual Rights

Developing and deploying AI should comply with the individual rights of information, access, rectification, erasure, restriction of processing, data portability, and the right to be informed. Suitable safeguards should be implemented when processing personal data to make solely automated decisions that have a legal or similarly significant impact on individuals.

Summary of hireEZ's Audit Result

The audit was mainly oriented towards examining the ethical standards behind the development of their application, and identifying technical and organizational issues related to its design and implementation. In this context, the analysis has been particularly **focused on detecting unfair forms of bias and discrimination derived from the algorithmic processing** involved in this application. This aspect was addressed explicitly through an Algorithmic Impact Assessment, which examined the technical specifications and social implications of such algorithmic processing. Based on these assessments, the algorithmic audit of hireEZ allowed the ML Research and Consulting team to recommend measures and practices aimed at improving the acceptability, desirability and proper management of personal data within the app, as well as minimizing and/or preventing bias and discrimination.

It went through several iterative steps:



- 1 Preparation (defining the use case and reviewing background documentation provided by hireEZ)
- 2 Stakeholder discussion (interviewing stakeholders of their platform and company policies to understand their internal development process, product features, data storage, algorithms etc.)
- 3 Assessment and analysis (we requested sample data from their big data to evaluate their bias and fairness, and assess their internal policies)
- 4 Planning mediation recommendations.

The four-fifth rule from References [3] is the guidance on adverse impact analysis by the U.S. Equal Employment Opportunity Commission (EEOC). As hireEZ does not provide any decision on any stage of the hiring process and has no visibility on the recruiter decision, the guideline is not applicable here. Instead, **we developed an assessment plan, tailored to hireEZ's product and context, which consisted of two phases.**

Summary of hireEZ's Audit Result

The first phase was to evaluate the AI ethics framework at hireEZ with respect to best current practices and provide suggestions. At first, hireEZ's AI governance framework was not well established. So, we helped them to develop the complete ethical principles set out in the strategy, commented on how to expand on these, and proposed indicators of success. For Accountability and Governance, we suggested documenting internal takes, algorithms, and decision processes. We also suggested mapping responsibilities to personnel and recording them, and having documented procedures and policies on data access, project workflow, and technical and managerial resources. For Lawfulness, Fairness, and Transparency, we suggested closely following legal regulations and trends to eliminate potential risks, performing regular auditing with a third-party to avoid undetected threats and ensure fairness, and maintaining internal documentation and explaining to the public how their product works. For Security, Data Minimization and Purpose Limitation, we suggested undertaking regular data security testing, defining proactive and reactive protocols for data breaches, and providing regular security and privacy training to employees. For Individual Rights, we suggested protecting individual data and having a data management plan for the full spectrum of data usage, from research to an in-market product.

The second phase was aimed at collecting and analyzing information regarding the practices, legal grounds and organizational aspects of the hireEZ team in charge of the project. We executed a series of tests to gauge the compliance of the system with the prioritized ethical values of the organization. The testing was designed to check whether the demographics of hireEZ's candidate pool is consistent with the US Bureau Of Labor Statistics. If their results were similar, then we might conclude that there was no bias at hireEZ AI sourcing. Otherwise, further investigation would be needed. As hireEZ currently stores more than 800 millions candidate profiles, it was not practical to conduct an exhaustive comparison. Instead, **we carried out two tests. One was to examine five common user queries, where each query included job title and other search criteria**, like skills, location, experiences, etc. These queries reflected what normal users would conduct on the hireEZ interface. **The other query was searching for some representative occupations and retrieving top candidate profiles.** The purpose was to reflect the general statistics among the whole candidate pool. The sample data and analysis coding scripts are available upon request. Overall, we did not find any statistical evidence of racial or gender bias in the result.

3 Equal Employment Opportunity Commission, Civil Service Commission, U.S. Department of Labor, & U.S. Department of Justice (1978). Uniform guidelines on employee selection procedures.

In Closing

Based on our audit result, we conclude that using hireEZ will have small risks of causing unfairness and bias. hireEZ's existing customers can request for a full audit report by emailing legal@hireez.com.

About ML Research and Consulting

ML Research and Consulting is a consultancy that helps organizations to solve a range of AI related problems and specializes in AI governance, AI strategies, and technical AI solutions. We have strong expertise on AI ethics and machine learning fairness, and a comprehensive knowledge and deep understanding on pertinent legislations to artificial intelligence.

As a research-oriented technology firm, **we are capable of providing cutting-edge AI solutions**, which include, but not limited to, natural language processing, image analytics, robotics, scheduling, algorithmic pricing, and visualization. We have provided services to various industrial sectors, e.g. finance, human resource, communication, healthcare. Deep knowledge in AI technologies has equipped us with a better position in understanding policies and practice of AI governance and their forefront research. ML Research and Consulting has worked with their clients to assess their AI risk and develop AI governance policies and strategies. The mission of ML Research and Consulting is to **advance AI technologies and develop ethical and robust AI solutions to benefit our humanity**. In addition to consultancy services, ML Research and Consulting **conducts cutting-edge research**, collaborates with world-leading researchers, and **provides free AI education to communities**. ML Research and Consulting is led by Prof. Haibing Lu from Santa Clara University, a world-leading expert on AI and machine learning fairness. He has published a number of highly cited papers in top-tier academic journals, such as IEEE/ACM Transactions and premier computer science conferences, like KDD, S&P. His research results have been featured by the 2019 United Nations Human Rights Report, Forbes, WIRED Magazine, and won international awards and recognitions, like INFORMS Minority Issues Forum Paper Competition, the AACSB's "2021 Innovations That Inspire", being invited to Workshop on Fairness, Bias, and Inequality organized by Harvard Business School, etc.