

Industry Partner Report

Reejig's Ethical Talent Al

The world's first independently audited Ethical Talent Al

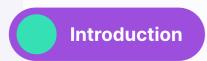


Reejig



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A new benchmark in **trust and ethics**

The only way to assure AI is ethical is by having it independently audited by a recognized expert in the field.

But in the current environment, there are no consistent and universally applicable standards for ethical AI, meaning vendors across all industries can call their technology ethical based on a self-assessment — without the input of legal, ethical, or global regulatory experts.

Reejig has an unwavering stance on the ethical development and deployment of our Al. As an artificial intelligence system drawing on large volumes of human data to provide automated decision-making support, we acknowledge the potential risk of facing ethical issues related to transparency, data privacy, gender bias, and/or unclear accountability for our customers and their workforces.

For this reason, in partnership with the University of Technology Sydney (UTS), we developed the world's first independently audited Ethical Talent AI, setting a new benchmark in trust and ethics for our industry.

Reejig has been recognized by the World Economic Forum as a 2022 Technology Pioneer as a result of this world-first innovation and the enduring impact this technology has on people, business, and society.

Reejig's Ethical Talent Al



Executive summary

Reejig partnered with UTS — leveraging cross-faculty collaboration including business governance, social justice, legal compliance, and data science — to define and apply a framework for the independent assessment of transparency, fairness, accountability, and privacy within the Reejig talent shortlisting algorithm (the Reejig algorithm).

The Reejig algorithm is a talent shortlisting system that aims to help organizations discover and connect with talent in their organizational ecosystems (including previous applicants, employees, alumni, gig workers, contingent workers). The goal here was to ensure fairness and transparency in the application of AI to career decision-making.

The approach taken with UTS included a combination of qualitative assessment with quantitative measurement, consistent with industry standard approaches for ethical review and based on those adopted in human ethics committees considering ethical implications of processes in health and medicine. The initial findings were complemented with a data-driven review of algorithm behavior, particularly in the context of bias and explainability based on performance against real-world data.

- The independent validation procedure is based on alignment of design, process, and operation against the key ethical principles of transparency, fairness, accountability, and privacy in the context of gender bias.
- The combination of qualitative assessment with quantitative measurement is consistent with industry standard approaches for ethical review, and based on those adopted in human ethics committees considering ethical implications of processes in health and medicine.
- In addition to an Ethical Validation of their Al, Reejig successfully
 performed a Functional Validation with industry partners including
 Salesforce demonstrating that the shortlisted candidates were "fit for
 purpose" and represented a strong shortlist well-aligned with the role
 requirements.
- The results? **97.4**% of shortlisted candidates exceeded the benchmark acceptance score of 65%, with the average candidate scoring 95.1%.

Based on the extensive qualitative and quantitative assessment of the Reejig algorithm and surrounding processes, UTS concluded that the development and operation of the algorithm is aligned with transparency, fairness in the context of gender diversity, accountability, and privacy objectives.

This achievement represents the world's first independently audited Ethical Talent AI.

We have detailed exactly what the review process and key findings were in this Industry Partner Report.





Partners

The audit was completed by the University of Technology Sydney and led by distinguished Professor, Fang Chen.



Other project partners







Recognition and impact

In recognition of the importance of this ground-breaking research with UTS, the methodology and outcome was included in the proceedings for the 2020 IEEE Symposium on Computational Intelligence, and received the 2021 Research Impact award in recognition of the impact this research has already had in shifting understanding of "what is possible" in assuring ethical AI.

Reejig has also been recognized by the World Economic Forum as a 2022 Technology Pioneer for our innovation in developing the world's first independently audited Ethical Talent Al.



A key barrier to the adoption of AI, and thus it's potential to do good, has been lifted. This is significant for organizations who want to do the right thing and minimize risk to their customers, their stakeholders, and their reputation.



Mark Caint
Al and Maching Learning Lead, World Economic Forum



Project **Overview**

Objectives

The non-biased talent shortlisting algorithm (the Reejig algorithm) is a talent shortlisting system developed by Reejig Pty Limited (Reejig) that aims to help organizations discover and connect with talent in their organizational ecosystems. Drawing on employment and management data held within the client organization as well as potentially public data, the Reejig algorithm is focused on the automated matching of potential candidates to roles in a way that aims to minimize negative unconscious bias.

As an artificial intelligence system drawing on large volumes of data to provide automated decision support, the Reejig algorithm could face ethical issues related to transparency, data privacy, gender bias, and/or unclear accountability. The assessment of the algorithm's adherence to core ethical principles is therefore critical to delivering a responsible solution which proactively addresses potential risk.

Drawing on data analytic techniques and emerging ethical guidelines and principles, this project defines and applies a framework for the independent assessment of transparency, fairness, accountability, and privacy within the Reejig talent shortlisting algorithm.



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Approach

The combination of qualitative assessment with quantitative measurement is consistent with industry standard approaches for ethical review and based on those adopted in human ethics committees considering ethical implications of processes in health and medicine.

A core element of the framework is iterative surveying about and subsequent discussion of ethical processes, practices and algorithm design. The UTS team conducted a detailed review in this context, examining Reejig's alignment with key ethical principles of transparency, fairness on gender, accountability, and privacy in the design, delivery, and operation of their talent shortlisting algorithm. Initial findings are complemented with a data-driven review of algorithm behavior, particularly in the context of bias and explainability based on performance against real-world data.

Drawing on data analytic techniques and emerging ethical guidelines and principles, this project defines and applies a framework for the independent assessment of transparency, fairness on gender, accountability, and privacy within the Reejig talent shortlisting algorithm.

The project commenced in August 2019. The UTS team has completed the following research activities in this project:

- 1. Desktop, Literature, and Industry Review
- 2. Framework development;
- 3. Framework test: Industry Partner 1 (KPMG)
- 4. Framework test: Industry Partner 2 (Salesforce)
- 5. Framework refinement for the testing process

Outcomes

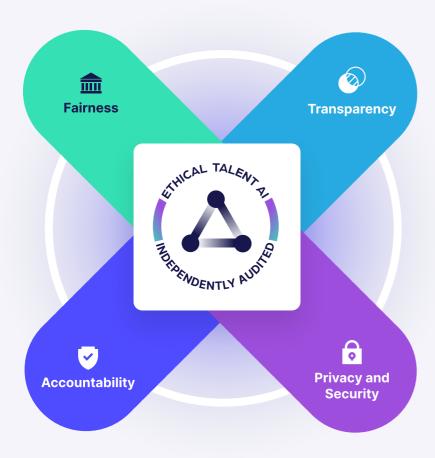
This section summarizes the assessment outcomes of the project. As noted, the assessment process was grounded in iterative independent qualitative, and quantitative reviews of the data and modeling, algorithm behavior, and performance against two representative real-world client data sets.

Reejig's Ethical Talent AI Project Overview



Ethical principles

The design and deployment of the Reejig AI talent matching algorithm was assessed by UTS against four key ethical principles of AI that their previous literature study identified as most critical.



Fairness

So that businesses can enjoy the benefits of a culturally diverse workplace, we work to remove unfair bias from the system.

Accountability

We work with experts, customers, and impacted stakeholders to create an algorithm that is easily auditable against the best real-world outcomes.

Transparency

We work hard to make sure you understand how our Al makes decisions, because we know that it's the combination of technology and human expertise that leads to the best outcomes.

Privacy and security

With big data comes increased responsibility. We ensure that privacy is respected and data is secured.

More info



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Fairness

Fairness reflects an absence of prejudice or favoritism toward an individual or a group based on their inherent or acquired characteristics. Simply put, fairness means not to bias outcomes for or against particular groups of people based primarily on their membership in one of those groups. Three principle segments of fairness were assessed:

- 1. Bias avoidance
- 2. Accessibility and universal design (Al systems should be usercentric and designed in a way that allows all users to employ Al systems)
- 3. Stakeholder participation

Transparency

Transparency refers to the need to describe, inspect, and reproduce the mechanisms through which an AI system makes decisions and learns to adapt to its environment. In the context of artificial intelligence, transparency is critical, given the "black box" or hidden nature of complex contemporary algorithms that are typically deployed. In these instances, users may not understand how the data is processed and why or how an output from the algorithm is obtained. For reasons of auditability and appropriate use, it is therefore critical to develop systems or processes which aid in the explanation, traceability, and risks of algorithmic decision-making.

Accountability

Accountability is about a clear acknowledgement and assumption of responsibility and "answerability" for actions, decisions, products, and policies. Four principle segments were reviewed:

- 1. Auditability
- 2. Minimizing and reporting negative impact
- 3. Documenting trade-offs
- 4. Ability to redress

Privacy and security

Given the automation of learning and access to big data that provides the foundation for functional AI, privacy and security demand the ability to control how data (especially personal data) is being collected, stored, modified, used, and exchanged between different parties. Three principle segments were reviewed:

- 1. Respect for privacy and data protection
- 2. Quality and integrity of data
- 3. Access to data

Reejig's Ethical Talent Al Ethical Principles



Ethical validation

In developing and refining the validation framework used within this project, UTS conducted both quantitative and qualitative assessment of Reejig algorithm design and deployment in the context of gender bias management:

- UTS developed and deployed new computational techniques and quantitative metrics for the validation of gender fairness and decision explainability. Representative real-world industry data was used to measure and assess algorithmic performance against these two ethical objectives.

 Assessments were reported to Reejig, and advice provided on subsequent action, where necessary or recommended.
- UTS developed and deployed qualitative assessments that covered each stage of the design, implementation, testing, and deployment of the Reejig algorithm. The broader UTS team performed this review, including an assessment against key ethical guidelines in the areas of transparency, fairness, accountability, and privacy.

Reejig's Ethical Talent AI



Based on quantitative testing against representative real-world data UTS confirmed:

- An active strategy has been adopted which successfully reduces gender bias in input data.
- Outputs from the application of the algorithm do not exacerbate or reinforce gender biases.
- Reejig provides faithful explanations of why the algorithm made decisions, though these are complex and will require simplification to be optimally meaningful for end-users.

Based on the final set of qualitative assessments UTS confirmed:

- The algorithm was developed with traceability in mind and includes documentation describing input data and training and testing methodology, all of which is accessible on request.
- Reejig provides a mechanism to review historical outcomes and decisions.
- Data is security managed, including auditable, authorized, and authenticated access to private data, data encryption at rest and in transit, data separation, logging of data access, application of mechanisms for notice, and control of personal data.
- Reejig has set up an adequate set of mechanisms to redress cases of harm or adverse impact produced by the Reejig algorithm.
- The characteristics, limitations, risk, and potential shortcomings of the algorithm have been communicated to end-users and have been documented.
- Reejig consulted with HR professionals and end-users during design and development; the developers of the solution included HR domain specialists and artificial intelligence specialists.

Based on the above, UTS concluded that the development and operation of the algorithm is aligned with transparency, fairness in the context of gender diversity, accountability and privacy objectives.

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Functional validation

This process engaged a select team from Salesforce's Australian Talent Acquisition function. Having successfully completed the independent validation of the ethical performance of Reejig's matching AI, the intent of this functional validation was to ensure that the outcome delivered on the business outcomes of automatically surfacing a ranked shortlist of candidates who are suitable for the role.

As inputs, matches were made against example roles that were business-critical for Salesforce in the region, using the public job descriptions on the Salesforce Careers site.

The critical roles nominated by the Salesforce Australia Recruitment Team were:



Account Executive

Enterprise Level – Sales



Account Executive

Commercial – Sales



Business Development Representative

Sales Development



Application Security Engineer

Tech

Summary results

- Against a benchmark score for suitability of 65%, the average score for shortlisted candidates across the four sample roles was 95.1%.
- 97.4% of all candidates exceeded the suitability benchmark score.
- The shortlisted candidates were found to be strongly aligned with Salesforce's requirements for the sample roles.

Reejig's Ethical Talent AI

Project results

The process of functional validation measured the suitability of shortlisted candidates matched by Reejig's Al against these critical roles.

This was performed by the Salesforce Australia Recruitment team using the following comparison metrics between each matched profile and the specific role:

Criteria	Assessment ¹					
Education Quals/Certs	Not aligned	In progress / limited	Strongly aligned	Not a factor in decision making		
Role Experience	Not ready	Next role	Doing role	Too senior		
Previous Employers	Not aligned	Adequate	Strongly aligned	Not a factor in decision making		
Skills	Not aligned	Adequate	Transferable / adjacent	Strongly aligned		

Using this approach and agreed weighting with the team, the shortlisted candidates for the identified roles were scored as follows:

Role	Suitability ²	Average	Minimum	Maximum
Overall	97.4%	95.1%	58%	100%
Account Executive Enterprise Level	100%	99.1%	92%	100%
Recount Executive Commercial	100%	98.3%	92%	100%
Business Development Representative	100%	95.8%	75%	100%
Application Security Engineer	90%	87.5%	58%	100%

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^{1.} **Assessment** Each recruiter used these assessment levels to separately rank each profile against the role it was shortlisted for. The levels highlighted in this table reflect a "suitable" level for each criteria.

^{2.} **Suitability** This represents the proportion of shortlisted profiles that exceed a 65% benchmark score from review of the assessment criteria



Summary



The world's first independently audited **Ethical Talent Al**

We're committed to using artificial intelligence for good. That's why, in partnership with University of Technology Sydney, we developed the world's first independently audited Ethical Talent AI certification, setting a new benchmark in trust and ethics for our industry. Our algorithms are compliant with global regulations on equal opportunity, anti-discrimination, and human rights so you can trust you're making good and fair decisions for your people.

Reejig

About Reejig

Reejig is a leading workforce intelligence platform that enables large scale organizations to find, retain, mobilize, and upskill talent at scale. Powered by the world's first independently audited Ethical Talent Al, Reejig acts as your central nervous system for all talent decisions, helping you create a world with Zero Wasted Potential.













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