

An investigation into the potential for Artificial Intelligence to support regulatory decision making in complaints about nurses in the US, UK and Australia

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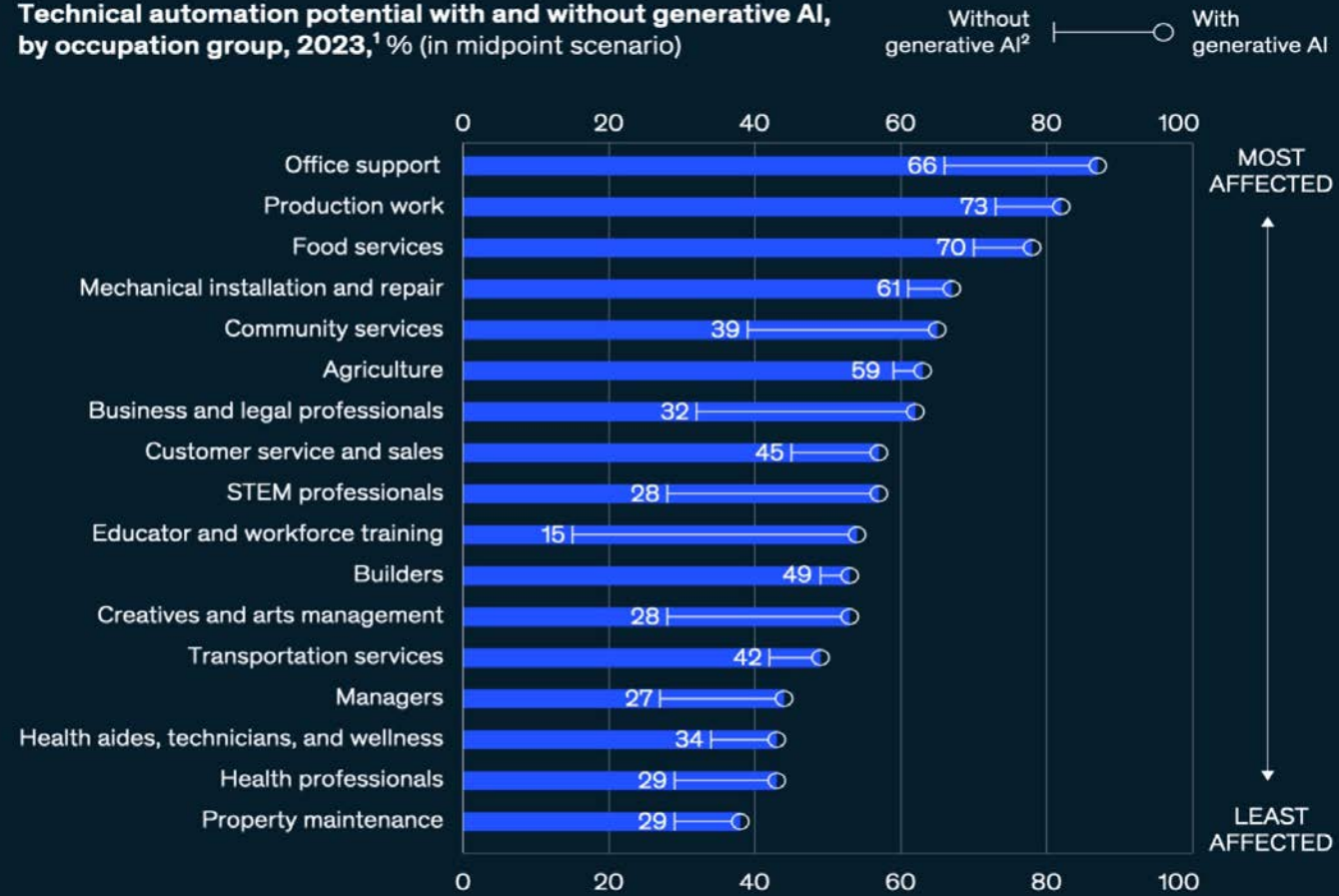


What was this study about?



The AI trajectory

Technical automation potential with and without generative AI, by occupation group, 2023,¹ % (in midpoint scenario)



Note: Figures may not sum to 100%, because of rounding.

¹Overall technical automation potential, comparison in midpoint scenarios.

²Previous assessment of work automation before the rise of generative AI.

Source: McKinsey Global Institute analysis

Is the regulatory environment ready for AI?

- ▶ Nurse Discipline
- ▶ There are a small number of high risk nurses
- ▶ 70+% of cases require no regulatory action
- ▶ Better use of data may help to focus on higher order risks and improve regulation

Research Question

Can we develop new tools to aid regulatory decision making in disciplinary work?

Aim

- Calculate risk level using anonymized data
- Link cases to regulatory standards
- Link cases to previous similar cases
- Reduce the workload for regulators

Design principles

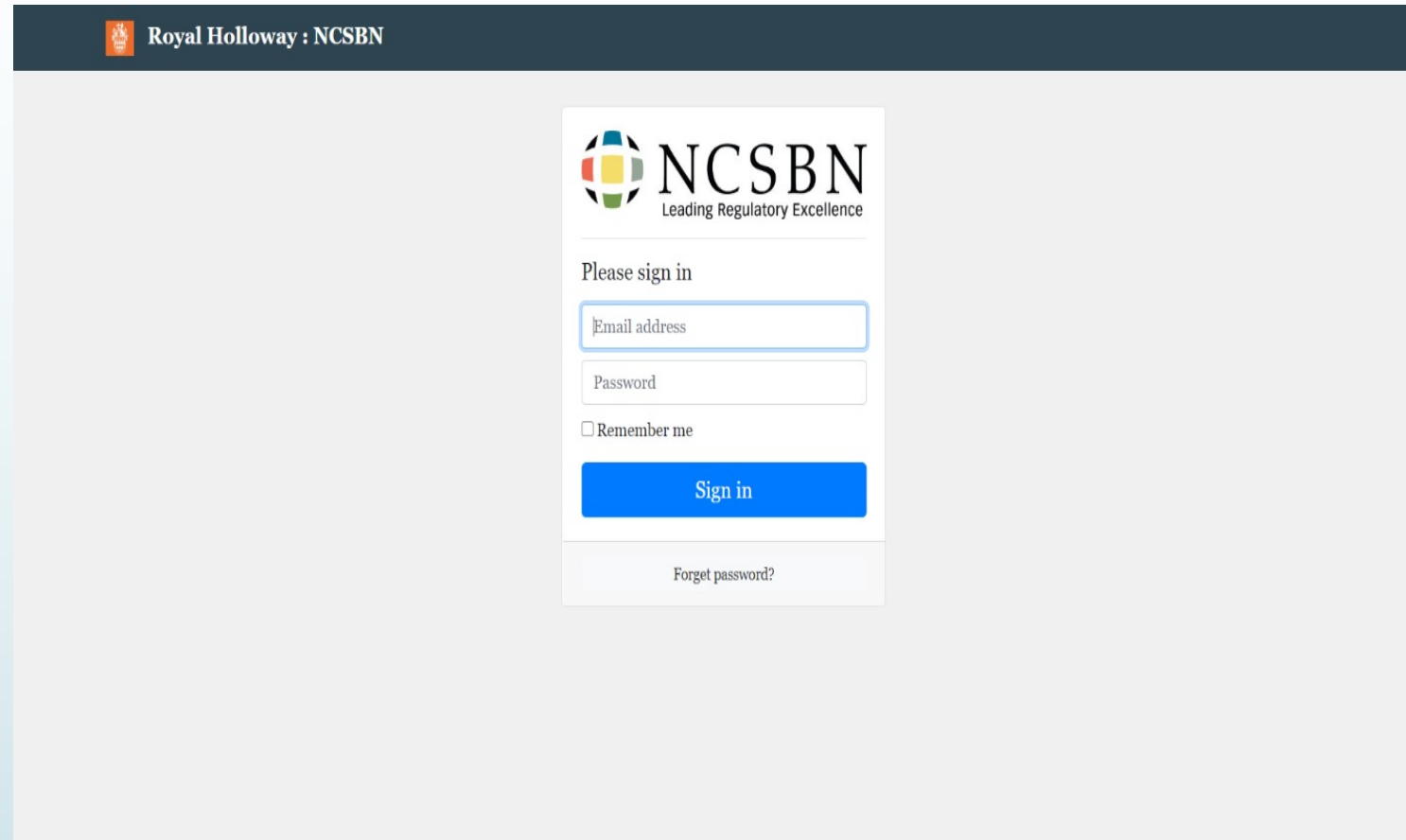
fairness, accountability sustainability transparency
(Leslie, 2019)

Methodology


Quantitative and Qualitative

- *5,700 (anonymized) disciplinary cases (US,UK,Australia)*
- *Reliability testing of prototype*
- *Gender debiasing techniques*
- *Qualitative testing with regulatory staff*

An overview of the prototype decision support tool



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Task 1: calculating risk using anonymized data

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Predict new cases

1) Select a prediction model
Logistic regression

2) Choose the data file to predict
Choose File No file chosen

3) Click to start processing
Upload & Predict

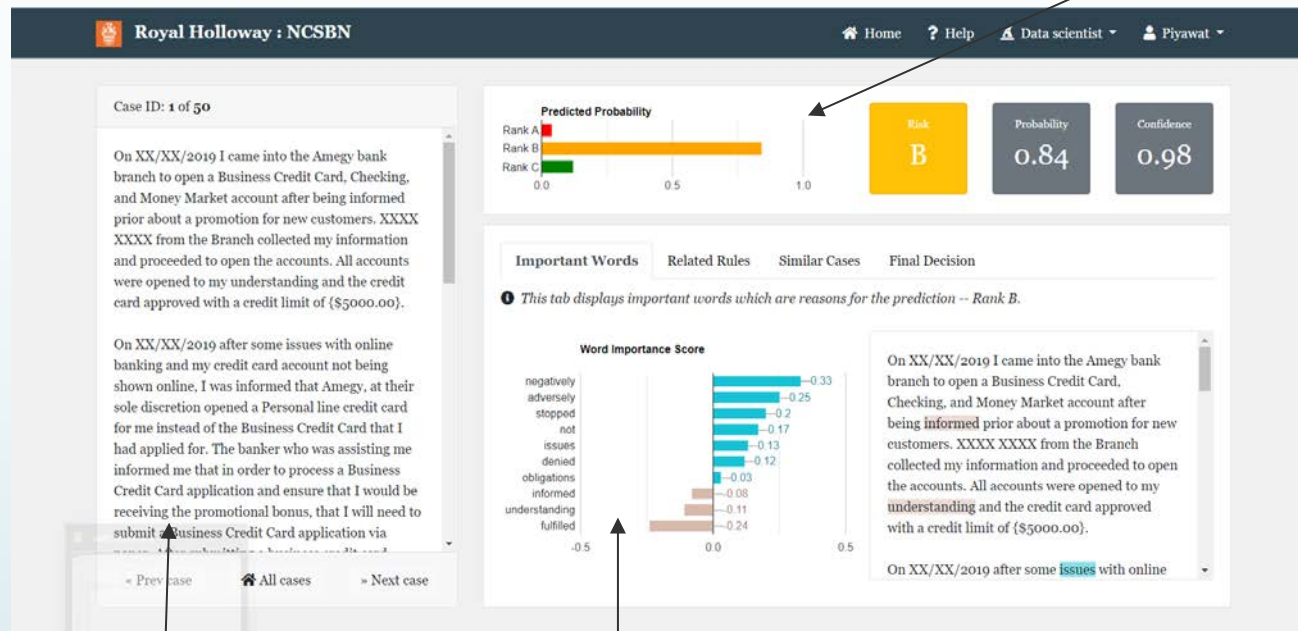
Results summary
Number of cases: 50

Percentage of the predicted categories

#	Complaint	Predicted Risk	Predicted Prob	Confidence Score	Final Decision
1	On XX/XX/2019 I came into the Amegy bank branch to open a Business Credit Card, Checking, and Money Market account after being informed prior about a promotion ...	B	0.84	0.98	Not entered
2	I have been unemployed since XXXX. Navient called me everyday and sometimes three times a day to collect. They kept giving me forbearance and reporting my loan delinquent. ...	A	0.99	0.99	Not entered
3	I have requested a loan estimate from a broker named XXXX XXXX at HST mortgage XXXX VA that has taken all my information and yet she denies me a loan estimate and ...	C	0.88	0.95	Not entered
4	XXXX has been non-compliant with removing the unverified account (XXXX XXXX XXXX XXXX XXXX) which has been deleted by XXXX and XXXX. XXXX and XXXX...	C	0.65	0.76	Not entered
5	I co-signed for my son 's Honda with Honda Financial services. His XX/XX/XXXX payment bounced. We were not notified until the account was past due. I immediately ...	C	0.98	0.98	Not entered
6	Please be advised this is my second complaint about Absolute Recovery Services , LLC. As stated in my previous complaint Absolute Recovery Services , LLC is violating ...	C	0.87	0.98	Not entered

Tool highlights key elements used in the prediction of risk category

Predicted risk level, probability & confidence



The complaint text used by the algorithm

Scores key words detected in the text

Task 2 & 3: compare current case with rules and previous similar cases

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Case ID: 1 of 50

On XX/XX/2019 I came into the Amegy bank branch to open a Business Credit Card, Checking, and Money Market account after being informed prior about a promotion for new customers. XXXX XXXX from the Branch collected my information and proceeded to open the accounts. All accounts were opened to my understanding and the credit card approved with a credit limit of (\$5000.00).

On XX/XX/2019 after some issues with online banking and my credit card account not being shown online, I was informed that Amegy, at their sole discretion opened a Personal line credit card for me instead of the Business Credit Card that I had applied for. The banker who was assisting me informed me that in order to process a Business Credit Card application and ensure that I would be receiving the promotional bonus, that I will need to submit a Business Credit Card application via

Prev case All cases Next case

Predicted Probability

Rank A
Rank B
Rank C

0.0 0.5 1.0

Risk
B

Probability
0.84

Confidence
0.98

Important Words Related Rules Similar Cases Final Decision

This tab shows rules from the regulations which are related to this case.

Rule 38i-1

Rule 38i: These will vary significantly from case to case but might include:

- the registrant committing violent offences or conduct or being verbally abusive

Related text sentence(s): Amegy is stating that it is within their rights and terms that they may evaluate me for personal credit card, when a business application has been submitted, but I have yet to receive where in the credit card application those terms are stated.

Result: Violation

Rule 401.2-D

Record of case manager decision

Relates to Texas Board of Nursing rules

Compares case to previous similar cases

Reliability results: Phase 1 testing

1241 cases

Model	Accuracy
Majority Baseline	0.617 ± 0.032
C1: Gradient Boost.	0.671 ± 0.025
C2: AdaBoost	0.646 ± 0.028
C3: CNNMultiTask	0.668 ± 0.029
C4: BERT-base	0.680 ± 0.038
C5: Meta info	0.662 ± 0.029
Ensemble model	0.708 ± 0.036

General ethical concerns

- ▶ Michael Sandel (2018)
 - ▶ Privacy and surveillance
 - ▶ Bias and discrimination
 - ▶ The role of human judgment
- ▶ Gabrielle Wolf (2020)
 - ▶ Equality before the law
 - ▶ Transparency and accountability
 - ▶ Consistency and predictability
 - ▶ Right to privacy
 - ▶ Right to work



Themes raised in our research



Negotiating trust and trustworthiness



Affirming fairness and non-discrimination



Managing burdens and benefits

Conclusions

..From data to policy?

- ✓ Using AI tools in nurse regulation is feasible & has the potential to bring benefits
- ✓ This work needs replication with a larger US dataset involving multiple states
- ✓ Engagement with regulatory staff, nurses and patients essential to successful integration

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Thank you

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