



Introduction

- Artificial Neural Networks (ANNs) and automation technology in general raise important social and ethical concerns, especially about accountability, autonomy, dignity, and justice
- We focus on the specific concerns arising from how the emerging automation technology will affect the workforce of the future, including increasing the indirect pressure to use neuroenhancement.
- We adopt the view that we must engage with stakeholders or their representatives to understand the implications of a technology that might directly or indirectly affect the stakeholders' (workers) lives, livelihoods, or wellbeing.

Methods

- We recruited and conducted 12 open-ended interviews with a diverse sample of workers
 - Interviews were structured to understand the ethical and societal challenges from their perspective during the implementation of automation.
- Data analysis was carried out concurrently with data collection to enable the integration of information from each step of the process.
 - Codes were developed by using abductive analysis, a form of qualitative content analysis that combines elements of both induction and deduction
 - Five analytic stages were employed:
 - familiarization with the data through transcript reading
 - identification of a thematic framework reflecting the ideas discussed;
 - indexing the data, i.e., identifying patterns across the transcripts;
 - charting the data
 - mapping and interpreting the data (making sense of the data holistically)

References

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Codes

- Five major themes were discovered during step (ii) of our analytic framework: 1. Work Experience 2. Employment Experience 3. Job Related Dilemmas 4. Integration of Automation into Workforce 5. Career Advancement
- Further subcodes were then identified for expansion of themes with new data

1. Work Experience:

- Education
- Years in workforce
- Past work experience
- variety of fields
- current job

- Work environment
- Field of work

- Job satisfaction
 - Enjoyment/ fulfillment
 - Overall experience
- Meaningful connection with others
- Opportunity to grow

2. Employment experience:

- Jobs applied to in past 12 months
- Frequency of Response
- Tools used for job search
- Tool used to send application

3. Job related moral quandaries/ dilemmas :

- Morally problematic situations
- Morally problematic decisions
- Split-second decisions to prevent bad outcomes
 - Possible bad outcome
- Negative Experiences
- COVID-related issues

4. Integration of automation into workforce:

- Opinion of automation
- Fairness of automation
- Perceived Risk of current job being automated
- Estimate of how soon it will be widely implemented
- Current automation being used
- Concerns with automation

5. Career Advancement:

- Plan if potentially replaced by automation
- Opinion of investing more time and money towards training for new career
- Resources necessary for training

Results: Trends and Observations

Theme 1
75% of subjects had a higher education (ranging from bachelors degree to masters)
Only 3 subjects indicated being in the workforce 10+ years and are the only ones to have given no indication of ever having obtained/ completed higher education
Attitude towards work associated with fulfillment obtained from the actual work/ sense of purpose the job gives you (they feel like their work is important= more positive attitude)
Overall employees are satisfied and those who are not are currently working towards obtaining credentials for desired occupation
Sense of purpose + satisfaction from work seems to be linked with how connected they feel with other people
Positive attitude towards work associated with environment that offers/ encourages/ promotes growth + learning

Theme 2
General trend is that less than 50% of applications sent got responses back with a couple of outliers (mostly healthcare)
Healthcare is a pretty safe field right now (many indicated being headhunted and multiple job offers)
Higher skill job=more applications sent (Those in data and computer science all indicated sending 100+ applications)

Job Search	Google	Company	we	Glassdoor	LinkedIn	Indeed	Word of mouth	Workday	Portal
	4	5	3	4	4	4	2	1	

Job application	Google	Directly to	Glassdoor	LinkedIn	Indeed	Word of mouth	Workday	Portal
	0	11	2	3	4	0	1	

Theme 3
Human intervention is required for risk mitigation
Sometimes bureaucracy hinders productivity and innovation instead of promoting it
Discrimination and unfair treatment based on race and private choices (i.e. choosing to smoke cigarettes during personal time) is still experienced in the workplace
Increased pressure and focus on expanding total profits over prioritization of quality of care is a major growing concern in healthcare

Theme 4
Automated future has been accepted as a reality
Increased automation in the workplace is generally perceived as fair
Individuals do not feel a sense of threat or urgency over the risk of their jobs being automated
General expectation is to see more technology being implemented within next 10 years

Theme 5
No individual had a concrete plan set if they were replaced by automation
Many mentioned an interest in switching to the tech sector
Overall a positive view on investing more time and money towards obtaining a better career
Approx. 30% of responses indicated that they were already continuing their education and training to obtain desired career

AOS	PJRS
4	3
4	1
5	1
5	1
2	0
4	1
5	2
3	1
2	1
3	3
2	2
1	1
avg. 3.333	1.416667

Automation opinion score (AOS)

- 0 completely against
- 1 Accepting but negative view
- 2 Understanding but cautious
- 3 neutral
- 4 positive but cautious
- 5 completely for

> subjectively rated by coder from overall tone and responses

Perceived job risk score (PJRS)

- 0 no risk at all
- 1 some parts could be replaced
- 2 significant portion could be replaced
- 3 whole job could be replaced

Conclusion

- We find that although workers agree that automation will significantly impact future of the workforce with opening new jobs, they are apprehensive about the prospects of immediate job loss and want their employers to be straightforward in how the introduction of automation will affect them.
- Workers have sophisticated views; they understand the limitations of automation and identify the threat to others livelihood; they express value in their own vocation and refuse to believe that it could also be automated.
- We submit that these findings, based on direct inputs from workers, should be considered seriously in decision-making about questions of socioeconomic justice.