

Project #22:

Sociotechnical harms in context: situated design of a Recommender System for Public Employment Services

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1. Introduction

1.1 HI in Public Employment Services

Public Employment Services (PESs) use data-driven and algorithmic systems to support unemployed or underemployed jobseekers to find work and training opportunities.

The Dutch PES (UWV) is in the early stages of developing a Recommender System (RS) to help jobseekers and job counselors to navigate the thousands of opportunities available.

1.2 Research Questions

- RQ1. How does context lead to sociotechnical harms?
RQ2. How can contextual analysis help designers to prevent or address emerging sociotechnical harms in job recommendation systems?

2. Sociotechnical harms in context

2.1 Sociotechnical harms

Recent scholarship (Shelby et al., 2023) has taxonomized sociotechnical harms in AI systems in order to enable practitioners to better anticipate them during design, e.g. **Representational harms** e.g. stereotyping...

Allocative harms e.g. opportunity loss, economic loss, ...

Quality-of-service harms e.g. service or benefit loss, ...

Interpersonal harms e.g. social control (e.g. algorithmic profiling), health (mental, physical), ...

Social system / societal harms e.g. political/civic harms (e.g. wrongful accusation), ...

2.2 Context analysis

To understand how sociotechnical harms emerge, we need to situate these technical systems in their sociotechnical context, which we can describe as layers of sub-contexts:

- **Institutional**, e.g. regulations to prevent & address harm
- **Organisational**, e.g. complaint/redress procedures, design practices
- **Use-case**, e.g. mediation of caseworker discretion, agency
- **Software**, e.g. bias, limits of representation, misabstraction

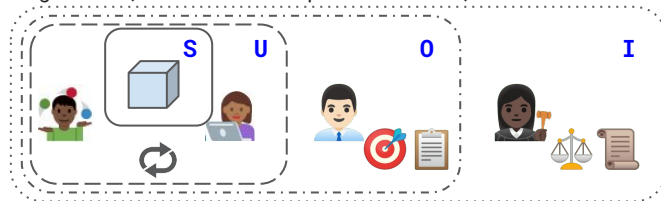


Fig.: Jobseekers' interactions with caseworkers are mediated through technical artifacts within sociotechnical systems (where actors pursue goals, follows practices & laws, have values, etc.)

3. Research Plan & Outputs

3.1 Analyse public tender documentation (and interviews)

Examine what contextual factors are accounted for in the design stage of the system. (What factors are excluded?)

3.2 Diagnose harms in similar systems

Use the Belgian PES (VDAB) as a historical example of a PES-RS that has already been built in order to draw lessons for the design of UWV's own system

3.3 Design recommendations

Develop design guidelines for how to account for contextual factors in the design of a RS in the Dutch PES.

References

- Leveson, N. G. (2012). Engineering a safer world: Systems thinking applied to safety. The MIT Press.
Shelby, R., Rismani, S., Henne, K., Moon, A., Rostamzadeh, N., Nicholas, P., Yilla, N., Gallegos, J., Smart, A., Garcia, E., & Virk, G. (2023). Identifying Sociotechnical Harms of Algorithmic Systems: Scoping a Taxonomy for Harm Reduction (arXiv:2210.05791).