

From Visibility to Accountability: Designing Actionable Transparency Infrastructures for Public-Sector AI

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Abstract

Transparency has become a central principle in AI governance, operationalised through mechanisms such as algorithm registers. Yet its impact remains limited. As currently implemented, it provides visibility rather than accountability: information about government AI systems exists but cannot readily be used by civil society for oversight, a gap we frame as actionable transparency. Through comparative analysis of nine algorithmic registers and interviews with civil society practitioners, journalists, and researchers, we identify structural barriers, including data fragmentation, lack of comparability, and the absence of civic entry points. We derive design principles and operationalise them in PublicAlgo, a civic platform prototype.

Background and Motivation

Public-sector organisations across Europe are increasingly deploying AI systems for inspection, welfare assessment, and risk profiling. Transparency has become a central expectation in response, operationalised through algorithmic registers, documentation standards, and forthcoming disclosure obligations under the EU AI Act (Veale and Zuiderveen Borgesius 2021). Algorithm registers were designed with an external accountability promise in mind, repositories through which civil society actors, journalists, and researchers can scrutinise how public bodies use AI (Haataja et al. 2020; Busuioc 2021).

The Research on registers is still limited, but points in two directions. Internally, registers appear to produce governance effects beyond their compliance function: the process of registering can expose governance gaps and catalyse accountability practices within organisations (Nieuwenhuizen 2024; Gagua et al. forthcoming). Externally, registers are of limited practical use to the watchdogs and oversight bodies they were designed to serve (Busuioc 2021). Organisations retain discretion over what they communicate, limiting what watchdogs can do with the output (Cath and Jansen 2022),

and disclosures are rarely structured for the cross-case analysis that journalism and civil society advocacy require.

Transparency in current governance frameworks produces visibility, however accountability requires more: that actors can act on that information to investigate, challenge, or redirect AI-assisted decisions (Ananny and Crawford 2018; Busuioc 2021; Diakopoulos 2016). What is missing is the condition under which transparency enables accountability action, what we frame as actionable transparency.

Research Questions

The central question is how transparency infrastructures can be designed to enable accountability use. Two sub-questions follow: (1) What limitations do current transparency infrastructures present for external actors? (2) What design principles are required to make transparency action-able?

Research Design

To address the RQ, the study follows a Design Science Research methodology (Hevner et al. 2004), in which artefact development and problem investigation proceed in tandem.

We systematically searched for national algorithm registers across the EU, identifying nine countries with some form of public register or registry-like structure (the Netherlands, the UK, France, Germany, Sweden, Estonia, Denmark, Spain, and Finland). For each register, all available data fields were collected and documented and an exhaustive comparative framework was built.

We are also conducting semi-structured interviews with researchers, civil society representatives, and journalists across countries. Interviews cover challenges encountered when accessing information about government AI systems; whether and how participants have used registers; what other sources they turn to; and what they find missing. Four

interviews have been completed, and data collection is ongoing.

Preliminary Findings and Design Principles

Based on preliminary analysis of the nine registers and four interviews, several structural barriers emerge. Register information is fragmented across jurisdictions and lacks a shared structure, making cross-case comparisons practically impossible without significant additional work. Key accountability-relevant fields, human oversight mechanisms, appeals processes, affected populations, and audit results are absent or sparsely populated across most registers. Moreover, where a field does exist, absence, non-collection, and active withholding are indistinguishable in all but one register. No existing mechanism connects register information to accountability action, a legal challenge or a structured investigation.

The following principles are based on the preliminary analysis and connect to prior work on transparency infrastructure design (Schuitemaker et al. 2024; Dehling and Sunyaev 2021; Metcalf et al. 2021; Diakopoulos 2016). (1) Transparency infrastructure should organise disclosures into navigable, comparable representations so accountability actors can find, cross-check, and identify gaps without manual document processing. (2) Transparency infrastructure should enable comparison across organisations, sectors, and system types, within and across jurisdictions, since accountability-relevant patterns (shared vendors, repeated non-disclosure, structural gaps) are invisible at the level of individual cases. (3) Where accountability-relevant information is absent, infrastructure should distinguish non-existence, non-collection, and active withholding so that silence itself becomes evidence.

These principles have been operationalised in PublicAlgo, a civic infrastructure platform. Each design decision responds directly to an identified barrier. Algorithm Profiles consolidate multi-source information for each system (DP1). Cross-jurisdiction comparison tools surface patterns across registers (DP2). A tri-state disclosure model distinguishes non-existence, non-collection, and exempted fields (DP3). Additionally, an integrated FOI request tool connects register information directly to accountability action, operationalising the concept of actionable transparency at the platform level.

Contributions

This paper presents a comparative analysis of nine national algorithm registers and exploratory interviews with civil society actors, journalists, and researchers, documenting structural barriers on both the supply and demand sides of trans-

parency infrastructure. From this, design principles are derived and operationalised in PublicAlgo. Whether the principles translate effectively into practice is what the planned co-design workshops will begin to test.

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