Artificial Intelligence, Data Totality, and the Reconfiguration of Human Agency: Societal Prospects and Crossed Perspectives

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1 Introduction

Artificial intelligence has moved from specialised industrial applications to a pervasive socio-technical infrastructure shaping communication, labour, governance, and personal life. As AI systems increasingly rely on large-scale, integrated datasets—including personal histories, behavioural traces, and organisational knowledge—new forms of data-total service provision are emerging. These systems promise highly personalised guidance, optimisation, and prediction, but they also raise concerns regarding autonomy, privacy, and the concentration of informational power [7, 5].

This paper investigates how such AI-driven service models reshape the relationship between individuals, institutions, and technological systems. Rather than treating AI as an isolated artefact, the analysis situates it within broader societal transformations, including the platformisation of knowledge, the automation of expertise, and the increasing reliance on algorithmic mediation in professional and personal decision-making.

2 The Rise of Data-Total AI Service Models

2.1 From Assistants to Integrated Life-Management Systems

Contemporary AI systems increasingly operate across multiple domains—health, finance, communication, productivity—enabled by cloud infrastructures and cross-platform data integration. Scholars have described this shift as the

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emergence of ambient intelligence [1], algorithmic life-management systems [11], and personal AI ecosystems [13]. These systems differ from earlier digital tools by their capacity to infer, predict, and recommend actions based on holistic user profiles.

2.2 Organisational Adoption and Engineering Environments

In enterprise contexts, AI-augmented Integrated Development Environments (IDEs) and cloud-based engineering platforms have become central to software development, modelling, and simulation. Industry analyses suggest that AI will increasingly function as a co-developer, embedded within cloud infrastructures that centralise organisational data [2, 8]. This trend reflects a broader movement toward knowledge-integrated AI systems capable of operating across entire organisational workflows.

3 Epistemic Authority and the Automation of Expertise

3.1 Delegation and Dependency

The integration of AI into decision-making processes raises questions about the redistribution of epistemic authority. When individuals rely on AI systems for personalised guidance, they delegate not only tasks but also aspects of judgement and interpretation. This dynamic echoes earlier analyses of technological mediation, where tools shape human perception and action [9, 14].

3.2 Opacity and Asymmetry

AI systems often operate through opaque or partially interpretable models, complicating users' ability to assess the validity of recommendations. This opacity can create asymmetries of power between service providers and users, particularly when systems rely on proprietary data or models [4]. In data-total service models, such asymmetries are amplified by the concentration of personal and organisational information within a single technological infrastructure.

4 Societal Implications: Autonomy, Governance, and Inequality

4.1 Autonomy and Behavioural Shaping

AI systems capable of modelling user preferences and predicting behaviour can influence choices in subtle ways. Research on algorithmic nudging and behavioural steering suggests that such systems may shape user behaviour without explicit coercion, raising concerns about autonomy and informed consent [15].

4.2 Institutional Trust and Data Governance

The centralisation of personal and organisational data in external infrastructures challenges traditional models of institutional trust. Users must rely on service providers not only for technical reliability but also for ethical stewardship, security, and long-term governance. Scholars argue that such dependencies require new frameworks of data fiduciary responsibility and algorithmic accountability [3, 10].

4.3 Structural Inequality

Access to high-quality AI services may exacerbate existing inequalities. Organisations with greater resources can deploy advanced AI systems, while individuals with limited digital literacy may become disproportionately dependent on opaque technologies. This dynamic risks reinforcing socio-economic divides and creating new forms of digital stratification [6].

5 Prospects for Responsible Integration

5.1 Human-Centred Design

To preserve human agency, AI systems should be designed to support meaningful human control—an approach emphasising transparency, contestability, and the ability to override automated decisions [12]. This requires interfaces that make reasoning processes intelligible and allow users to calibrate trust appropriately.

5.2 Governance Principles

Responsible adoption of data-total AI models requires governance frameworks that address:

- data minimisation and purpose limitation,
- algorithmic transparency and auditability,
- user sovereignty and revocability,
- institutional accountability and oversight.

5.3 Cross-Disciplinary Collaboration

Given the societal scale of AI's impact, effective governance must involve collaboration among technologists, policymakers, ethicists, and affected communities. Crossed perspectives—technical, social, philosophical—are essential for understanding how AI reshapes human practices and institutional structures.

6 Conclusion

AI systems built on comprehensive personal and organisational data represent a significant transformation in how knowledge, decision-making, and agency are distributed across society. While such systems offer opportunities for enhanced personal support, organisational efficiency, and predictive insight, they also introduce risks related to autonomy, dependency, and structural inequality. Addressing these challenges requires a combination of human-centred design, robust governance frameworks, and interdisciplinary engagement.

References

1. Aarts, E., Wichert, R.: Ambient intelligence. In: *Technology Guide*, pp. 244–249. Springer (2009)
2. Amershi, S. et al.: Software engineering for machine learning. In: *ICSE*. IEEE/ACM (2019)
3. Balkin, J.: Information fiduciaries and the First Amendment. *UC Davis Law Review* 49(4), 1183–1234 (2016)
4. Burrell, J.: How the machine "thinks": Understanding opacity in machine learning. *Big Data & Society* 3(1) (2016)
5. Crawford, K.: *Atlas of AI*. Yale University Press (2021)
6. Eubanks, V.: *Automating Inequality*. St. Martin's Press (2018)

7. Floridi, L.: *The Fourth Revolution*. Oxford University Press (2014)
8. Gartner Research: AI in engineering and enterprise systems: Strategic trends (2024)
9. Ihde, D.: *Technology and the Lifeworld*. Indiana University Press (1990)
10. Mittelstadt, B.: Principles alone cannot guarantee ethical AI. *Nature Machine Intelligence* 1, 501–507 (2019)
11. Rouvroy, A., Berns, T.: Algorithmic governmentality. *Réseaux* 177(1), 163–196 (2013)
12. Santoni de Sio, F., van den Hoven, J.: Meaningful human control over autonomous systems. *Frontiers in Robotics and AI* 5 (2018)
13. Shneiderman, B.: Human-centered AI. *Communications of the ACM* 63(8), 32–35 (2020)
14. Verbeek, P.-P.: *Moralizing Technology*. University of Chicago Press (2011)
15. Yeung, K.: 'Hypernudge': Big Data as a mode of regulation. *Information, Communication & Society* 20(1), 118–136 (2017)