

Technology and Digital Intelligence: Steering a Sociotechnical Transformation

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We are living through a period in which intelligent digital technologies have moved out of the laboratory and pilot project and into the everyday machinery of organisations and public life. Generative artificial intelligence drafts our documents and our code; recommendation systems shape what we read and buy; algorithmic systems increasingly mediate consequential decisions in lending, hiring, clinical triage and the delivery of public services. The headline conversation tends to fixate on the cleverness of the underlying models. Yet anyone who has tried to deploy these technologies inside a hospital, a bank, a factory or a city government knows that the model is rarely the hard part. The hard part is the surrounding system of people, processes, incentives, institutions and rules into which technology is woven.

It is this surrounding system, the sociotechnical fabric of digital transformation, that I want to bring into focus. The term I find most useful for it is digital intelligence, understood not as a fashionable synonym for AI but as the interface at which technological innovation, organisational practice and societal governance meet. Digital intelligence emerges when capable digital technologies are embedded in real contexts of use. It is at this interface that value is created, that risk quietly accumulates, and that the most consequential design and policy choices are made.

Beyond the algorithm

There is a meaningful difference between studying an algorithm and studying digital intelligence. The first asks how a system computes; the second asks what happens when that system is placed in the world. A fraud-detection model may be accurate in the abstract and still be unjust in practice if the data reflect historical bias, if frontline staff cannot interpret its outputs, or if customers have no meaningful route to contest a decision. A clinical decision-support tool may be technically impressive and still fail if it does not fit the rhythm of a clinician's workflow or the liability structure of the institution around it. Treating these as purely technical problems all but guarantees that we will keep being surprised by social and organisational failures.

A sociotechnical perspective insists on holding the technical and the human in a single frame. It treats data pipelines, machine-learning models and user interfaces as inseparable from the skills, norms, organisational routines and legal frameworks that surround them. This is not a softening of technical rigour. It is the precondition for that rigour to matter.

A converging technological substrate

The present moment is defined less by any single breakthrough than by convergence. Applied and generative AI are maturing alongside cloud and edge computing, blockchain and distributed-ledger systems, spatial computing, ambient intelligence and the data ecosystems that feed them all. Increasingly, value comes from how these capabilities combine, for instance, platform economies built on application programming interfaces, data marketplaces, and services that stitch several intelligent components into a single seamless experience.

This convergence raises the stakes of design. Interoperability, data portability and technical

standards cease to be back-office concerns and become determinants of competition, resilience and even sovereignty. Architectural choices made today, how data is shared, where computation happens, which interfaces are kept open, will shape the distribution of power across the digital economy for years to come.

The same questions, sector by sector

Digital intelligence is never an abstraction; it lands differently in each sector. In healthcare it promises earlier diagnosis and more personalised care, yet it confronts acute demands for safety, explainability and equity. In finance it enables real-time risk assessment and new models of credit and payment, while raising questions of fairness, systemic risk and supervision. In education, adaptive learning and generative tools are reshaping how knowledge is produced and assessed, forcing a rethink of what we teach and how we evaluate it. In manufacturing and logistics, intelligent automation and digital twins are reorganising supply chains and the very nature of industrial work. In public administration and the creative industries alike, the same underlying technologies are remaking service delivery, authorship and the relationship between institutions and the people they serve.

What is striking is how often the same problems occur across these domains in different dress: the challenge of earning trust, the difficulty of integrating new tools into established workflows, the persistent tension between efficiency and accountability. This is precisely why a cross-sector conversation is so valuable: the most useful lessons frequently travel from one industry to the next.

Keeping people at the centre

If there is a single point I would press on colleagues and practitioners, it is that these systems are ultimately for people. The most important frontier is not autonomous machine intelligence but human-AI collaboration: configurations in which intelligent systems augment human judgement rather than simply displace it. This places a premium on the behavioural and experiential dimensions of technology; how people understand, trust and work alongside intelligent systems; whether an interface invites appropriate reliance or quietly encourages automation bias; and whether the wider workforce has the digital literacy to use these tools critically.

Adoption, in other words, is not an event that follows invention. It is an organisational and human process of change management, skills development and cultural adjustment that ultimately determines whether a technically capable system delivers real value or fails by degrees.

Governance at the speed of technology

Running through all of this is the question of governance. As intelligent systems take on decisions that affect rights, livelihoods and access to services, algorithmic accountability and transparency move from optional virtues to basic requirements. Data sits at the centre of this shift: questions of data sovereignty, data ethics and cross-border data flows are now strategic concerns for firms and states alike. Regulatory frameworks are evolving rapidly and unevenly across jurisdictions, and technical standards and interoperability requirements are quietly doing a great deal of governance work of their own.

The difficulty is one of pace and coordination. Technological capability advances faster than the institutions meant to steer it, and it does so across borders that regulation struggles to follow. Closing that gap will require not only better technology and better rules, but better translation

between the people who build these systems and the people who govern them.

A practice-to-policy agenda

This, in the end, is the perspective I believe the field most needs: a practice-to-policy lens that connects what is technically possible, what is organisationally workable, and what is socially and legally desirable. Too much scholarship and commentary live at only one of these levels. The pressing questions, however, are integrative. How do we design intelligent systems that are not merely accurate but trustworthy, adoptable and accountable? How do organisations transform themselves – their processes, their people, their cultures – to use such systems well? And how should governance frameworks evolve to protect public interests without foreclosing beneficial innovation?

Answering questions of this kind calls for work that crosses the usual boundaries between computer science and management, between engineering and law, between the academy and the institutions where these technologies operate. It calls for rigorous case studies and policy analyses as much as for new methods and models, and for a genuine dialogue among researchers, practitioners, regulators and designers. It was to provide a dedicated forum for exactly this kind of integrative cross-sector inquiry that the [International Journal of Technology and Digital Intelligence](#) (IJTDI) was established.