QUICK GUIDE:

Digital Transformation and AI

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A contribution to the Task Force on Artificial Intelligence, Data Governance and Innovation for Sustainable Development

This knowledge resource contributed to the work of the Task Force by assessing digital transformation challenges in a holistic and comprehensive manner, relevant to AI and data governance across both the Sherpa and Finance Tracks

Knowledge partner: UNESCO

DIGITAL TRANSFORMATION AND ARTIFICIAL INTELLIGENCE

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# 1.	INTRODUCTION

Terms like digitization, digitalization, datafication and digital transformation are often used interchangeably. There are no universal definitions. But working understandings can help to recognize where AI technologies fit in, and show the links to human rights and sustainable development.

# 2.	DISTINCTIONS AND CONNECTIONS

- **Digitization** describes the technical conversion of paper documents, photographs and electronic signals (eg. broadcasting, voice communications) into digital formats, which then makes them easy to duplicate, distribute and be decoded by machines).

- **Digitalization** is a wider term. It refers to how the technical process of digitization also involves social processes and activities, and how people change their legacy use of physical and electronic analogue technologies by replacing them with systems that integrate computers, connectivity and data.

- **Datafication** designates the conversion and collection of outputs (ranging from electronic pulses through to a corpus of documents, films and images), into a digital resource. The output of datafication can serve as an input for processing (especially by digital tools) into a further level of output (such as data-driven decisions, automated classifications and generated "synthetic" content). Access control and records-management are integral considerations in datafication processes.

- **Digital transformation** goes beyond digitalization and the use of digital technologies to encompass the economic and political context, organizational culture and management and individual practices. A host of energy, environmental and social factors are also connected to the dynamics of digital transformation. The process of digital transformation entails balancing opportunities and risks, as well as investment costs versus benefits. The calculus is relevant at institutional, enterprise and societal levels.

- **AI technologies are a major part of digital transformation.** The development, uptake and impact of AI technologies are capturing much current attention as stakeholders seek to stimulate and shape digital

transformation more broadly. There are also many other technologies in digital transformation, such as the deployment sensors (and the Internet of things), the rise of cloud computing, cryptocurrencies and the use of blockchain systems and brain-computer interfaces.

- **Contextualising AI within digital transformation** highlights how these advanced technologies: (a) require digitization and datafication as a baseline; (b) depend on being integrated with social processes; and (c) are further shaped by a society's wider framing of digital transformation. In turn, AI's deployment has impacts on digitization, datafication, digitalization and other determinants of digital transformation. While AI is a key part of any digital transformation strategies, governments also need to invest in digital transformation overall, regardless of AI specific policies.

3. HOW THE TECH STACKS UP

- **All layers of the "tech stack"** are subject to digital transformation. For example:
  - **Compute:** this is about the what gets done regarding access to high-power processing chips as core technical infrastructure (and it includes issues of digital public infrastructure and cloud-based computing).
  - **Data layer:** this tier is about transformation to harmonize technical formats, portability and interoperability. It also entails governance of rights to privacy, intellectual property and access to this key resource.
  - **Network layer:** the connectivity of devices (including satellite-based links), involves investment incentives and costs to consumers as affect digital divides, as well as transformation concerning policies on internet shut-downs.
  - **Transport layer:** digital transformation at this level implies standards for transmission protocols and for their continuous updating, as well as network neutrality (referring to the transmission of different data types).
  - **Storage layer:** increasingly this is about the use of cloud services and their control, as well as local/foreign data centres and issues of data sovereignty.
  - **Security layer:** this tier covers changes affecting technical systems and behaviours in regard to data protection, hacking and intrusion, regimes for reporting breaches, the role of intermediary security providers, and standards for red-teaming and safety testing.

- o **Energy layer:** Digital transformation relies on electricity and water supplies, which are not only technical preconditions, but are also functions of wider national policy provisions including about environmental protection.
- o **Model layer:** this is about influencing ongoing changes in operating systems, software creation systems (open and proprietary), language models and reasoning systems, and if these are backwards compatible with legacy systems.
- o **Application layer:** Transformation affects availability of software applications (e.g., fintech, chat apps); app stores; governance of privacy and other concerns (e.g., apps facilitating non-consensual sexual imagery); authorised permissions.
- o **Content layer:** The presence and promotion (or not) of public interest content (including language, culture, educational, and electoral content) intersects with digital transformation, as do definitions of - and actions on - illegal content and behaviours.
- o **Individual users of digital technologies, developers and creators, as well as the wider public:** digital transformation at this level is about the ethical development and application of digital technologies, plus levels of public literacy and resilience about the significance and safeguards as well as a society's change management capacities.

4. VALUES AND OPTIONS

- **UNESCO's framework provides values to guide digital transformation.** Using the objective "Internet Universality", UNESCO highlights four essential elements for optimizing the benefits of digital transformation for human rights and sustainable development. Summarised in the acronym ROAM, these elements are: (i) *human rights alignment;* (ii) *openness* (meaning transparent and interoperable, and preserving fair and competitive markets); (iii) *accessibility* (fashioned to include people of different abilities, languages, classes, and geographies); and (iv) being *governed by multistakeholder participation.* UNESCO's Recommendation on the Ethics of Artificial Intelligence and associated instruments also have high relevance to digital transformation more broadly.

- **Governments' options in digital transformation.** Overall, authorities have a dual role: (i) shaping their society's environment for digital transformation,

and (ii) ensuring the same transformation within organs of the state. Within these limits and possibilities, a country's place in the layers of the global "tech stack" (described above) can determine its affordances for shaping digital transformation. This relates to affordance like shaping supply chains, data policy, connectivity levels, digital security, and content creation and circulation.

5. WHERE'S THE OPPORTUNITY?

- Where states can influence digital transformation in society:

  - **Digital connectivity:** Policies on internet access and disruptions. Besides considerations of universal service and minimum bandwidth, meaningful connectivity includes affordability, the availability of relevant content, including content in relevant languages, and the capabilities which people need to make effective use of the Internet and advanced services like AI.

  - **Digital Public Infrastructure (DPI):** This is about incentivizing investment in e-identity, e-transactions, open data and other facilities that have public benefit.

  - **Data:** By availing raw data, ensuring data protection, and considering public interest overrides to allow data disclosure from both public and private data holders, states can unlock public value.

  - **Skills:** Governments can update education systems for national digital capacities.

  - **Applications:** There are prospects for authorities to use Open Source models and to encourage developing Small Language Models that are suited to the society concerned.

  - **Fostering openness in digital economies:** Governments can implement competition policy in cases where "network effects" reinforce centralisation and gatekeeping, and give support to Micro, Small and Medium Enterprises (MSMEs).

  - **Content level:** Fostering journalism and addressing threats to information integrity.

  - **E-government:** Digital transformation within states has internal aspects involving the digitalization of governing processes and public

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services. It also has external facing aspects, particularly in Open Government practices. These refer to a default orientation towards transparency plus access to the information and data held by state services, with restrictions being exceptional (and requiring justification that is legally authorised, necessary and proportional, and for legitimate purpose). UNESCO's policy guidelines on public sector information and data elaborates these issues.

o **Mitigation**: Digital transformation within states also means strategies to migrate across barriers which UNESCO identifies as (i) *cultural/organizational factors;* (ii) *infrastructure/data/IT elements;* and (iii) *skills deficits*. Examples of these are: inertia and legacy decision-making practices; sunk investments in outdated technology, the short-term costs of technology change, avoiding cybersecurity risks; and deficits in capacity, such as in procurement decisions regarding AI systems. A whole-of-government approach is needed to advance the opportunities and mitigate the obstacles to digital transformation within the state and state-owned enterprises.

6. LOOKING FORWARD

- A coherent and comprehensive approach to digital transformation is important for governments as a prior step to specific policies such as on AI. Multistakeholder input, along with the involvement of the range of state bodies, will help shape desired intra-state and society-wide effects of digital transformation within the G20 and beyond.