3. Assessing digital transformation progress

Digitisation and digitalisation are often used interchangeably. However, there are critical differences between them. This chapter explores the meaning behind digitisation and digitalisation and how to measure them. The chapter also outlines a methodology to evaluate the state of digitalisation in national statistical offices.

3.1. What is the digital transformation of statistical systems?

While the terms digitisation, digitalisation and digital transformation are widely used, often interchangeably (Bloomberg, 2018[34]), there are critical differences between them in terms of their scale and objectives (Figure 3.1).

Digitisation mainly relates to the transformation from analogue to digital data (e.g. scanning of paper documents, with or without optical character recognition). This is an obvious and mostly technical step on the path towards digital societies, only loosely (but not necessarily) impacting actual working processes and interactions. Digitisation makes the information, not the process, digital (Bloomberg, 2018[34]).

Digitalisation is a more complex endeavour whereby digital applications and processes leverage digital data. Typically, digitalisation will impact isolated or siloed business processes. In the world of official statistics, these could include being the switch from a paper-based survey to a fully digital process involving electronic data collection, storage, processing, analysis and dissemination. Successful digitalisation often results in sectoral improvements in terms of data quality and timeliness and efficiency gains. Such siloed and sectoral improvements, however, lack horizontal integration (e.g. with other statistics or surveys). Reusing the outputs and results of a fully digitalised survey in more traditionally computed statistics will often require some ad hoc manipulation of the data for which formal processes and tools have not necessarily been implemented, and this can lead to unexpected complications and limitations. Although digitalised statistical processes offer many advantages over their fully analogue counterparts, it must be recognised that their lack of transversality can also cause unwanted and unplanned challenges in the future.

For a long time, NSOs have used information technology (IT) to improve the efficiency of statistical processes. However, such innovations have remained confined only to specialised areas, creating islands where IT tools are less likely to interoperate, share data, and work together as a cohesive system. This fragmented environment of individual and disparate systems created what many researchers called silos within NSOs. Silos restrict the clarity of holistic vision, meaning that NSOs have struggled to have the significant impact desired with regard to using digital technologies. These reasons include a mismatch between IT systems and actual processes and a lack of seamless flow of data across its lifecycle (PARIS21, 2021[1]).

- **Digital transformation** aims to address these very challenges by looking holistically at the processes at stake within the whole institution. A digital transformation is a fundamental change in the way statistics are produced. It is more than only introducing and using digital technologies. Rather, it should be seen as a technology-aided deep rethinking of the core work of an institution. Bosnia and Herzegovina provides a very telling example (MakStat, 2020, p. 87[24]): The digital transformation of the national statistical system is being hampered by the complex institutional setup of three statistical institutions with different structures, each using different tools and having insufficient resources. A technological transformation alone cannot achieve much here, and the core governance and functioning of the statistical system need to be redesigned to accommodate the integrated deployment of digital approaches. Similarly, the key challenges and constraints to comprehensive digital transformation identified by the National Statistics Office of Mongolia key are more organisational than purely technological [country example Mongolia]. Chapter 3 highlights the need for a multi-dimensional approach toward digital transformation.

Figure 3.1. Digital organisation
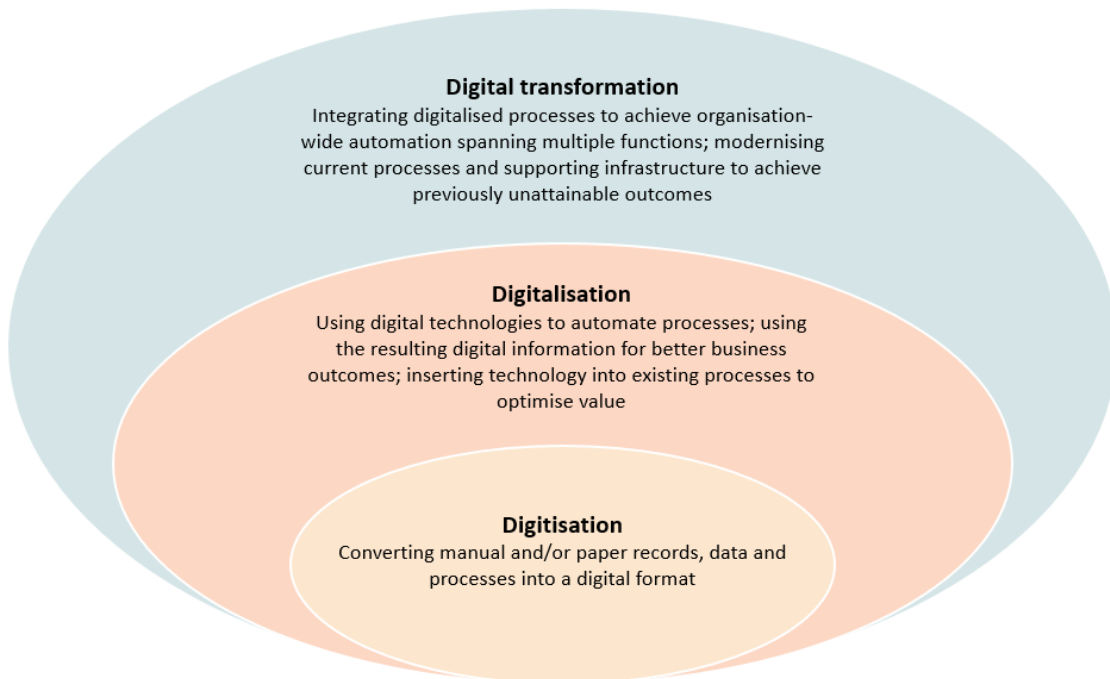
Source: Authors

3.2. Measuring multi-dimensional digital transformation

Most of the existing methods, frameworks and tools to assess an organisation's digital situation and identify possible areas for improvement are designed for private sector institutions. As such, they do not directly apply to the situation of NSOs,[1] but their overarching philosophy is generic enough to serve as a general guideline or mindset for organising an NSO's digital transformation. Most, if not all, emphasise and consider the multi-dimensional character of digital transformation.

For example, the TM Forum's Digital Maturity Model[2] takes is a very comprehensive model along six dimensions, each one split into the sub-dimensions of the customer, strategy, technology, operations, culture and data. With its "digital quotient", the McKinsey Digital diagnostic takes a slightly simplified approach based on the four dimensions of strategy, culture, organisations and capabilities.[3] Price Waterhouse, with the Industry 4.0 model, suggests a gradation of organisations from digital novice to a vertical integrator, horizontal collaborator and, ultimately, digital champion; it further evaluates organisations' performance in terms of business models, product and service portfolio; market and customer access; value chains, processes and systems; compliance, legal, risk, security and tax; and organisation and culture.[4]

Evaluating a statistical institution's digital maturity

Similarly, and more specifically related to the context of official statistics, the PARIS21 (2020b[35]) Capacity Development Framework takes a multi-dimensional approach to describe a national statistical office's overall capacities, building on three levels (individuals, organisation, system) and five targets (resource, skills and knowledge, management, politics and power, incentives).

In addition, the Modernisation Maturity Model from the High-Level Group for the Modernisation of Official Statistics (HLG-MOS) refers to five levels of maturity (initial awareness, pre-implementation, early

implementation, corporate implementation, mature implementation) that can be applied to five dimensions (business, methods, information, applications, technology) (UNSD, 2021b[36]). It should be noted that this model is primarily meant for the self-assessment by NSOs towards the HLG-MOS standards: the Generic Activity Model for Statistical Organizations, Generic Statistical Business Process Model, Generic Statistical Information Model and Common Statistical Production Architecture. However, to a certain extent, this model could also be adapted to analyse an NSO's digital maturity.

Finally, the Knowledge Management Framework developed by Oneoff-tech (Colombo, 2020[37]), built on four organisational legs (people, processes, technology, governance), recognises that the ultimate aim of an NSOs' digital transformation is to produce action-oriented knowledge for sectoral experts and decision makers through improved collection, processing, aggregation and contextualisation of raw data into statistical information. A coherent combination of actions across those four legs is needed to accomplish this.

This paper focuses on four key dimensions, all found, in one form or the other, in the above-mentioned frameworks), to provide a methodological coherence without overcomplicating the study. These are:

- individuals
- technologies
- organisation and processes
- system and/or environment

While the number and descriptions of the dimensions can be debated, the choice of these four reflects this paper's central message — that a digital transformation has to do only partially with technology. Obviously, new tools and technologies will be introduced and implemented, but a full digital transformation can never be successful if the other dimensions are overlooked or not properly considered.

This approach aligns with the OECD (2014[25]) Recommendation of the Council on Digital Government Strategies. The following table shows the correlation between the dimensions used in this paper and some of the related OECD recommendations.

Table 3.1. Correlated dimensions of digitalisation

Dimension	Related OECD recommendations
Individuals	• Reduce digital divides in societies • Be inclusive, involve stakeholders
Technologies	• No technology-first approach: factually evaluate the needs and requirements before procuring or developing technologies
Organisation and processes	• The establishment and enforcement of organisational and governance frameworks are prerequisites for implementing digital strategies • Real-life business cases shall guide the establishment and implementation of digital strategies • Institutional capacities, especially in terms of planning, management and monitoring, must be continuously reinforced
System and/or environment	• Identify incentives for external stakeholders to become active partners in the statistical production • Be open towards your environment (open data, transparency, public value creation, etc.) • Ensure or facilitate a coherent use of digital technologies across policy areas and levels of government • Harness international co-operation to maximize the added value of the statistical production • Ensure that the necessary policy and legal frameworks are in place for facilitating and enabling the digital transformation

Source: Authors' correlation

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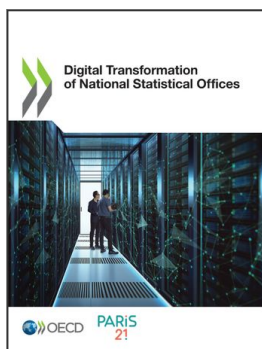
Notes

[1] The success of a private company's digital transformation can be evaluated to some extent in terms of financial gains. NSOs usually are not able or allowed to fully operate in the free-market economy and generally see and measure the outcome of their digital transformation in terms of internal efficiency and user satisfaction. An NSO, therefore, interacts with its users (i.e. consumers of data and statistics) very differently than a private company interacts with customers who buy its goods or services. Moreover, the choice of outputs produced and disseminated by an NSO (statistics, interactive data services, etc.) is largely dictated by legal and policy constraints that may or may not match the actual requirements, needs and wishes of external users.

[2] See https://www.tmforum.org/digital-transformation-maturity/.

[3] See https://www.mckinsey.com/business-functions/mckinsey-digital/how-we-help-clients/digital-2020/our-assessments/strategy.

[4] See https://www.pwc.nl/en/assets/documents/pwc-industrie-4-0.pdf.