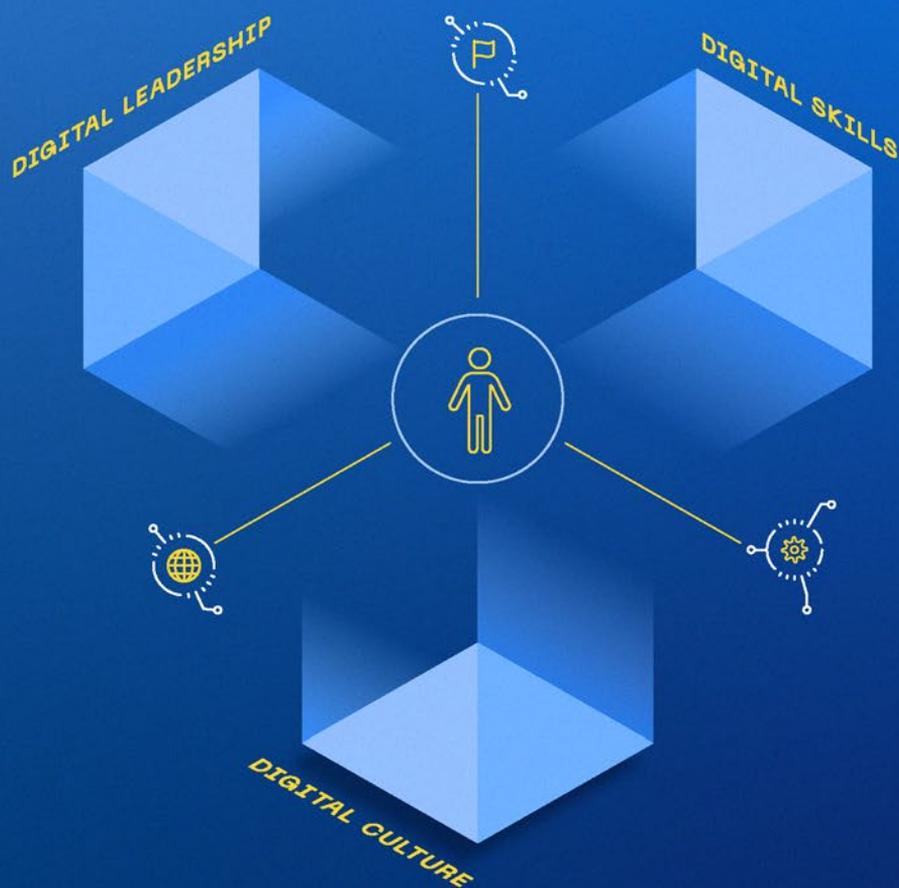


# A Global Study on **Digital** **Capabilities**





# Acknowledgement

This global study on Digital Capabilities for the Digital Economy was prepared by a World Bank team led by Samia Melhem (Lead Digital Development Specialist, Digital Development Global Practice), co-led by Astrid Herdis Jacobsen (Senior Digital Development Specialist, Digital Development Global Practice). Astrid Herdis Jacobsen and Mark Thomasson have led the chapter on digital capability frameworks and digital leadership. Sajitha Bashir (Adviser, Education Global Practice) has led the chapter on digital skills. Victor Lim Fei has led the chapter on digital culture.

The work was carried out under the general direction of Boutheina Guermazi (Global Director, Digital Development Global Practice) and received guidance from Michel Rogy (Practice Manager, Digital Development Global Practice) and Nicole Kligen (Practice Manager, Digital Development Global Practice), respectively.

The work gained insightful research and analytical contributions from colleagues, including Jane Treadwell, Liz Arney, Mark Thomasson, Maryam Lawal, Sajitha Bashir (Adviser, Education Global Practice), Youngyun Lee, Victor Lim Fei and Galina Voytsekhovska.

The team would also wish to express their gratitude to World Bank Group staff for sharing their knowledge and thoughts through interviews, including Charles Hurpy, Casey Torgusson, Ida Mboob, Jerome Bezzina, Juan Navas Sabater Isabel Neto, Mikhail Bunchuk, Natasha Beschoner, Oleg Petrov, Rajendra Singh, Siddhartha Raja, Siou Chew Kuek, Tim Kelly, Alain Sawadogo, Rami Amin and Xavier Decoster.

The team is also grateful to Andrea Carugati (Professor, Associate Dean for Digitalization, Department of Management, Aarhus BSS, Aarhus University), who served as expert external reviewer of the leadership chapter. In addition, the team recognizes Anupam Govil (Partner, Avasant), Dr. Nader Imani (VP Festo Didactic, Germany) and Muhammad Sani Abdullahi (Chief of Staff, Kaduna State, Nigeria) who collectively provided expert advice to the study's thematic focus and design during the consultation process as well as a widely attended consultation webinar (280 participants)

Other World Bank Group staff and experts who contributed to this study included Christine Howard, Hadiza Eneche and Marga O. De Loayza for handling logistics, budget and data management.

Finally, the team thanks Mark Thomasson and Anna Brown, the editors of this study, and Sergio Andres Moreno Tellez, the visual designer for the report.



## METHODOLOGY

This study has been informed by a desk-based review of digital capabilities framework literature from academic and consulting firms' sources; secondary data analysis from reports and research on digital capabilities; direct input from the lead and contributing authors. In addition, contributions were generated during virtual webinars and knowledge exchanges (brown bag lunches) on the topical area, as well as in-person meetings held in Washington, D.C, and consultation with experts from the private sector/academia, as well as multilateral agencies who possess expertise in digital technologies and digital transformation, such as UNDESA, ITU, OECD, WEF and UNESCO.



## AUDIENCE

The main audience of this study is policy makers, public sector digital development professionals and digital leaders from client countries. This study also targets a broad audience of digital development professionals from within the World Bank Group, donor community, and client countries. Finally, the report audience includes academic researchers within this knowledge domain.



## DISCLAIMER

The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the World Bank Group. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by the World Bank Group in preference to others of a similar nature that are not mentioned. The views expressed in this information product are those of the author(s) and do not necessarily reflect the views or policies of the World Bank Group.

# Foreword



## The Increased Relevance of Digital Capabilities in the Shadow of COVID-19

As the global economy had to either shut down or go online in March 2020 due to the COVID-19 pandemic, the topic of Digital Capabilities for nations, government institutions, private sector, larger society, and people has gained much visibility and ownership. Since March 2020, a flurry of policy and programmatic interventions in response to the global pandemic emerged to demonstrate the usefulness of digital capabilities for people as a range of digital tools and techniques were deployed by governments, businesses, schools and citizens for business continuity, trade, learning and working from home. The COVID-19 pandemic has reinforced the need to accelerate the digitalization agenda, as countries and institutions transition to remote work and on-line service delivery, all of which require a strong foundation of digital infrastructure, and as has been increasingly evident, digital capabilities.

Most urgently, and as demonstrated throughout this study, digital capabilities are indispensable attributes for any government to minimize and mitigate the COVID-19 pandemic's impact on society and on the economy. Furthermore, aspects of the World Bank Group's COVID-19 response heavily rely on digital capabilities to mitigate the crisis and utilizing the data generated from mobile sources to remediate the health and economic crisis caused by the pandemic. Against this backdrop, the study explores the relevance of digital capabilities as a thematic area to be reflected in the actions of governments and in the World Bank's digital response during and after COVID-19. To support policy maker's work with identifying and qualifying digital capabilities initiatives, we conclude this study with concrete actions that the World Bank could consider implementing to create an enabling environment for digital capabilities.

# Executive Summary

As the digital economy expands and as countries are developing their digital maturity<sup>1</sup>, there is a need for increased focus on coherent digital transformation strategies for a whole-of-government<sup>2</sup> or even whole-of-nation approach<sup>3</sup>. This approach would align the undergirding institutional structures, the physical and immaterial enablers of a digital economy, and digital capabilities towards the ambition of the digital transformation strategy – thereby enabling the desired outcomes. Digital economy interventions have often focused on establishing the physical and immaterial enablers such as digital infrastructure and applications. However, this study posits that to succeed, digital transformation of countries, regions or cities must be driven by leadership and include strategies that address digital skills for all and fosters a digital culture.

This study is a deep dive into the digital capabilities of leadership, skills and culture and is aimed at stimulating reflection and at repositioning the human capital aspects of digital transformation as a key contributor alongside digital infrastructure and applications. Any digital strategy should supplement investments in technology with one or more “fit for purpose” digital capability initiatives that invest in what is often labelled the “soft” or “people” infrastructure.

To support this work the Digital Capability framework was conceived as the conceptual framework for understanding and contextualising the concept of digital capabilities. The framework was developed on the basis of extensive research into existing frameworks for digital capabilities that found little collateral covering the public sector perspective. Consequently, the Digital Capability framework and the exploration of Digital Leadership, Digital Skills and Digital Culture has been completed based on existing literature and on a series of interviews with policy makers and World Bank Group’s task team leaders. The digital capability framework sets citizens at the centre of digital transformation and emphasizes citizen-centric service delivery and engagement. An underlying assumption behind the deep dive in the digital capabilities of leadership, skills and culture is that careful design and enhancement of digital capabilities drives impact and success from ambition to desired outcome.

- 
- 1 As described in the “World Development Report 2016: Digital Dividends”, WBG 2016
  - 2 OECD defines a whole-of-government approach as “one where a government actively uses formal and/or informal networks across the different agencies within that government to coordinate the design and implementation of the range of interventions that the government’s agencies will be making in order to increase the effectiveness of those interventions in achieving the desired objectives”. OECD, “Whole of Government Approaches to Fragile States”, 2006
  - 3 Whole-of-nation expands on whole-of-government approach to bring together stakeholders in government agencies, NGOs and private sector organizations (Omar, 2021) – and even private citizens so that everybody who is interested in the process of community or nation-building can directly participate

Based on the review of existing literature, we **define digital capabilities as the ability of an organization to use resources<sup>4</sup> effectively for achieving its overarching goals and objectives.** They are the result of knowledge exchange and continuous improvement processes through the organization's human capital. The concept of capability is multi-disciplinary and multi-faceted in nature. Digital capabilities are the sum of the expertise and skills of the people (staff) in the organisation combined with the capacity of the organisation to leverage that expertise. An organisation's capability, therefore, relies on systems, frameworks, processes, and tools to achieve results.

This study posits that **the digital capability themes of leadership, skills and culture are a prerequisite for success of any digital transformation strategy.** Leadership is positioned as the most important and foundational digital capability, because it is the task of the leadership entities to develop digital skills for the users and workforce and to promote an inclusive digital culture.

Digital leaders develop excellence along three dimensions: the leadership profile, the leadership role and the leadership behaviour. The leadership profile includes the mindset, knowledge and skills that leaders must master, while the leadership role requires the leader to set the scene for the digital transformation, including the vision and the associated challenges and risks. Finally, in the leadership behaviour dimension the study recommends six concrete behaviours that digital leaders should embody, including being a change agent and citizen-centricity.

However, strong and instrumental digital leadership must be supported by a clear governance structure that sets out roles and responsibilities in relation to driving digital transformation. The study indicates that the "Essentially Digital Governance" (EDGE) model<sup>5</sup> can serve as inspiration for how to design the governance of the country, region or city's digital transformation, and that governments must include governance of digital platforms in their considerations.

Digital leadership should forge alignment at all levels around capacity building initiatives, change management (including new ways of working and using digital skills), and the cultural change necessary for effective, data-driven decision making and project implementation. Digital leaders need to develop organizational capabilities to continuously envision, deliver, and scale successive waves of investment in digital technologies. They need to be fluent in and appraised of pro-digital policies in order to imagine best ways to leverage digital technologies for growth and development.

---

4 Resources: An organization's resources are all the assets, processes, attributes, and knowledge that enable an organization to implement its strategy (Adapted from Barney, J. 1991. Firm Resources and Sustained Competitive Advantage. Journal of Management)

5 Dunleavy and Margetts. 2015. "Design Principles for Essentially Digital Governance."

**There is a wide digital skill and digital literacy gap that excludes some population groups** from the benefits of a digital economy as documented in the World Bank Group's report on the Future of Work in Africa.<sup>6</sup> Digital skills are a prerequisite for citizens, professionals, civil servants and policy makers to reap digital economic dividends across all sectors of the global and regional economy.

**Strong digital skills allow government services to be re-designed with a citizen-centric focus and with citizen co-creation.** As a result, digital technologies are forecast to be a major driver of productivity, with successful economies depending on greater numbers of digitally skilled citizens, users and workers than has previously been the case<sup>7</sup>. In order for citizens and professionals to successfully perform digital work, they must develop the corresponding digital skills. Ensuring that every person has the appropriate skills for an ever-growing digital and globalized world is an essential aspect of public policies targeted towards building digital capabilities, promoting inclusive labour markets, and engendering innovation, productivity, and growth. The study, therefore, examines a variety of stakeholders and the digital skills they need acquire, such as basic digital skills for citizens, e-business skills for entrepreneurs, professional digital skills for jobs in the technology sector, advanced digital skills for engineers, as well as digital skills for policymakers and civil servants.

**Digital culture is the third deep dive of the study and is regarded as important to sustain the digital transformation efforts of a country, region or city.** A digital culture is discussed in terms of the beliefs, values, and behaviour of people. The study emphasises the importance of ensuring inclusivity for all in society as the country advances towards digital transformation. The study suggests eight attributes that should be strengthened to foster a strong digital culture. These include a digital first mindset, data-driven decision making, experimentation, and digital inclusivity.

Strengthening these attributes of a digital culture require strong emphasis on communication campaigns, stakeholder consultations, collaboration with private sector companies (such as OrangeLab, GoogleChallenge, Microsoft4Africa, etc.), innovation competitions, user centric and agile design processes, co-creation, and fostering a culture of open data and open innovation. In addition, fostering a digital culture requires investments in cybersecurity training and in cyber ethics to ensure trust in digital.

**A strong digital culture ensures that no person is left behind as a country advances in its digital transformation.** Various analyses have documented

---

6 Choi, Jieun, Mark A. Dutz, and Zainab Usman, 2020

7 Ibid

that insufficient attention paid to the cultivation of a digital culture is the most significant barrier to digital transformation efforts and that the impact of culture is a substantial influence in digital initiatives and recruitment of digital talent. The digital culture of a country would benefit from a “digital first” mindset among citizens where digital solutions are the default way forward. Public sector leadership and investment choices are key to influence this culture, but so is the way that digital initiatives are implemented, e.g., using a design-thinking approach for citizen-centric solutions, leveraging data-driven decision making and nurturing an innovation ecosystem with regulations that promote digital experimentation and tech entrepreneurship. In terms of business processes and practices, digital culture commits societies to openness and accountability, while also planting the seeds for agile behaviour in order to achieve adaptive and timely responses to change. Finally, the focus on a “home grown” digital culture is argued to combine the best of local talent and culture with the best of global tools. It also ensures that local know-how and talent is growing, ensuring ownership and sustainability of digital capability initiatives, within a specific local context.

**With a particular view of the World Bank Group’s activities, there is a need to assess how to operationalize the research findings as a policy and programmatic priority.** The study provides suggestions on the “how” for each digital capability. Many investments in fostering digital capabilities are happening already. This study focuses on the intentionality of embedding digital capabilities components, and on the delivery mechanisms these would require, in the World Bank project pipeline.

In short, there is an abundance of activities around leadership, skills and culture that are necessary to foster to achieve successful digital economy projects. They all fall under the Digital Capabilities framework, an innovative concept which deserves further exploration as we head towards full implementation of the Digital Economy concept in several countries and regions.

As described above, **this study is organized around the three digital capabilities** that have been identified as part of the literature review, which forms the basis of the study: Digital Leadership, Digital Skills and Digital Culture. The first chapter embeds these three capabilities in a digital transformation framework that links the capabilities with the enablers and structures that provide the prerequisites for delivering transformative outcomes. The subsequent three chapters represent deep dives into each capability. The study’s core chapters are followed by a postscript that puts the digital capabilities into a World Bank Group context and provides recommendations for how to operationalize the three capabilities in the context of World Bank Group’s programs.

1

# Digital Capabilities and Digital Capabilities Frameworks

With the advent of what some analysts call the fourth industrial revolution, or the second machine age,<sup>8</sup> with technological advances disrupting business models, and with more and more aspects of social life taking place in the digital space, societies have truly entered the digital era. This era is, in many ways, different from the previous industrial paradigm and different from the earlier phases of digitalization in terms of reach, complexity, technology, and outcomes. In this era, leaders and practitioners require new mindsets, strategies, and toolkits to thrive. They, therefore, need to successfully build digital capabilities for their digital transformation journey.

The concept of digital capabilities is fairly recent. The research literature associates most of the concept to private sector competitiveness, as firms leverage digital tools and techniques to reskill their workforce, upgrade their infrastructure, optimize their products' quality and delivery, and compete for greater market share. However, for public sector, the concept is relatively new.

What needs to be in place at an organizational level for a government, a ministry, a college or municipality to be considered 'digitally capable'? This goes beyond the capabilities or competencies of individuals, inclusive of those individuals at the highest level of management. It requires consideration of structural issues such as leadership and strategy, cultures of innovation and engagement, staff development and reward, and how the digital environment supports individuals to express and develop their digital capabilities.

## Digital Capability Frameworks

Digital capability frameworks are typically developed and adopted to help businesses, governments and people accelerate digital innovation by helping:

- » To analyse the current state of digital transformation and identify new use cases as enabled by core aspects of the framework.
  - Inspire the design and implementation of context-specific digital capability frameworks.
- » To address the socio-technical dimensions of digital transformation with a focus on digital capability.
  - Mapping digital skills across various departments and/or population groups.

- Plan and structure learning materials as well as design of new curricula and improve on existing ones.
- » To develop a clear roadmap of processes and digital technologies to be leveraged and optimised for a country's digital transformation strategy.
  - Setting the basis for a discussion and building consensus in a more structured and coordinated manner across various entities involved in digital transformation

This study has reviewed several digital capabilities frameworks developed by consulting firms (e.g., Deloitte, McKinsey, PwC, EY, Bain, BCG, Avasant), global corporations (Microsoft, GE, Unilever) academic institutes, and universities (INSEAD, Plymouth, JISC) and international organizations such as ITU, OECD and UNESCO to better understand the landscape of digital capabilities. The research also noted the use of digital power, quotient, and/or digital IQ, which is used interchangeably in digital capability frameworks designed by top consulting firms or universities. Some immediate observations are made from the review of digital capabilities frameworks, as follows:

- » There is no unified, common definition of digital capabilities.
- » All frameworks assume, that digital capabilities relate to the qualities of the whole system rather than capability as an individual asset. Digital capabilities are a term for the efficiency by which the system or organization can deliver results.
- » Most of these frameworks illustrate three cross-cutting themes at the heart of digital capabilities: Leadership, Skills and Culture. The latter two terms are often coined as competencies and mindset, depending on the literature source we reviewed.
- » The frameworks are comprehensive. They differ in how the elements in the frameworks are understood and linked together.
- » Implicitly, the frameworks recommend a course of action by mapping areas of importance for advancing the digital economy.

Inspired by the review of existing leading digital capability frameworks a comprehensive digital capability framework is proposed (see Figure 1). This digital capability framework takes a public sector perspective and will serve as a context for this study of digital capabilities. It sums up and combines elements and important features from the reviewed frameworks and links digital capabilities (capabilities), enabling resources such as technology, data, or people (enablers), and structural elements such as legal framework, organization, funding (structures), with the strategic direction of delivering people-centred services.

The digital capability framework embeds the capabilities, enablers and structures into a process lifecycle perspective of the digital transformation journey, and it includes three main components: (i) a strategy or ambition with a digital perspective; (ii) a strategic operating model encompassing capabilities, enablers and structures; and (iii) a system of execution/implementation leading to outcomes. These three components determine the ability to implement a desired digital transformation vision. The framework emphasizes the alignment between strategy, operating model and execution to increase efficiency, inclusion and results. Thus, the digital capability framework can guide the design of efficient implementation approaches of digital economy transformation, putting people first in all aspects and assessing the quality and cost effectiveness of implementation strategies and the longer-term benefits and resilience of building digital capabilities.

With the holistic understanding of digital capabilities within the framework, for our purposes we define digital capability as:

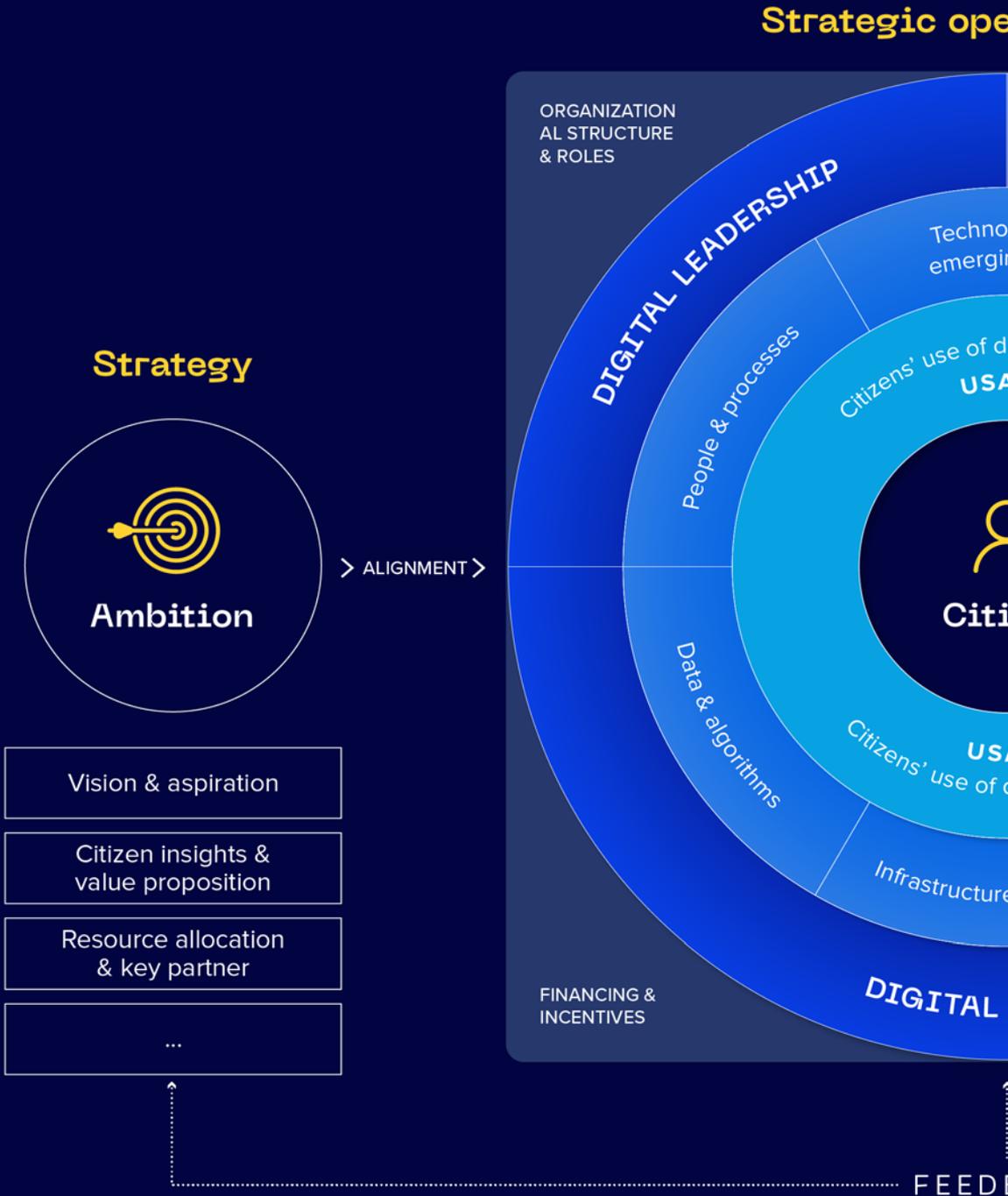
*An Organization's Capability is its power or ability to generate an outcome, e.g., meet current and future objectives and challenges. It is the sum of the expertise (and skills) of the people (staff) in the organisation combined with the capacity of the organisation to apply that expertise. An organization's capability thus relies on systems, frameworks, processes, and tools to achieve results. Capabilities are the ability of the company or organization to use resources effectively for their ends. They are the result of knowledge exchange processes through the organization's human capital<sup>9</sup>. The concept of digital capability is a multi-disciplinary and multi-faceted one. It covers strategy, leadership, workforce capability, delivery and organisational effectiveness.*

---

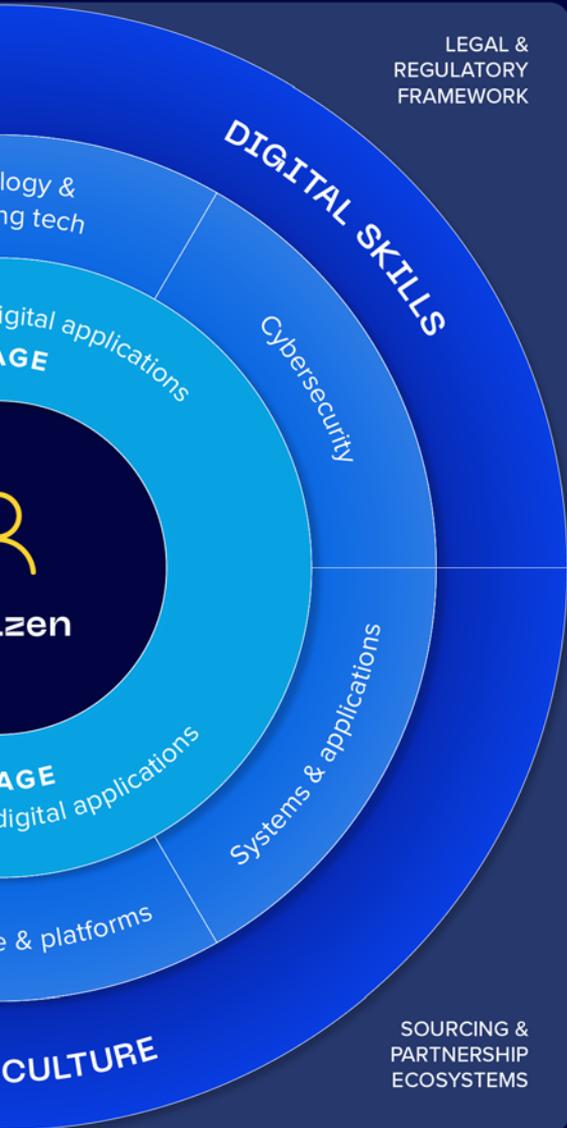
9 Resources: An organization's resources are all the assets, processes, attributes, and knowledge that enable an organization to implement its strategy (Adapted from Barney, J. 1991. Firm Resources and Sustained Competitive Advantage. Journal of Management).

**FIGURE 1**  
Citizen-centric Digital Capability Framework

Source: WBG Research



# Integrating model



## Execution

> ALIGNMENT >



- Develop initiatives
- Execute roadmap
- Build trust, engagement and participation
- ...

BACK

The terms skills, capabilities, and competencies are often used interchangeably in the literature reviewed. They are also used to describe attributes of people and organizations and can be used in combination with the term resources and capacities. There are, however, subtle differences, and consequently, we have defined the related concepts in table 1.

Through the review of leading digital capability frameworks, we have noted that leadership, skills and culture are emphasized as key digital capabilities. This study, therefore, undertakes deep dives into these three important digital capabilities. Each capability is covered in separate chapters. The aim of these deep dives is to provide an overview of main issues and themes related to the digital capabilities and cover important aspects to consider when designing digital capability components and strategies for accelerated digital transformation.

Our literary review and analysis find that leadership is the most foundational digital capability since it is the task of the leadership to develop digital skills for the workforce and the users and to promote an inclusive digital culture.

## BOX 1

### Conceptual Definitions of Skills, Capacity and Core Competence

RELATED CONCEPTS	
<b>Skills</b>	A skill is the capacity of a person to do something well. It is an ability acquired through deliberate, systematic, and sustained effort to smoothly and adaptively carry out complex activities or job functions involving ideas (cognitive skills), things (technical skills), and/or people (interpersonal skills).*
<b>Capacity</b>	A capacity is the ability to perform a task in at least a minimally acceptable manner. Capacities need to be well-structured and recurring behaviours to classify as capabilities. This implies reacting purposefully to new inputs and situations also involving a certain degree of strategic decision making.**
<b>Core competence</b>	A core competency is an essential asset for the survival of a firm in the long term and can be a mix of skills, resources, and processes.***

\*Definition of a skill, <http://www.businessdictionary.com/definition/skill.html>

\*\* Helfat et al. 2007. *Dynamic Capabilities: Understanding Strategic Change in Organizations*.

\*\*\* M. Tampoe. "Exploiting the core competences of your organization." *Long Range Planning*.



2

**Digital  
Leadership**

While basic disciplines of leadership might be universal across domains, digital leadership requires leaders to develop new skills and new approaches to thrive in the digital age that in many ways differ from the previous industrial age. We investigate the digital leadership agenda with a focus on public sector leaders from middle management to policy makers. The investigation is based on an understanding of leadership as made up of three key dimensions, namely the leadership profile, the leadership role, and the leadership behaviour. The past decades of increased digitization and automation have seen countries, regions, and cities move ahead on their digital transformation journeys. This study has attempted to categorize a number of typical digital transformation strategies to illustrate leaders' different approaches. Finally, the chapter on digital leadership explores the leadership choices related to governance.

Before leaders can explore what leadership initiatives to implement to facilitate a digital transformation, it is necessary to determine the changes that are caused by the availability of digital technologies:

- » **Digital technologies allow service production and consumption to be separated across time and space** – for many government services there is no longer a need for in-person delivery, a much-valued feature under COVID-19 pandemic. Nevertheless, moving citizen from in-person to digital services may require assistance for those without digital skills, the necessary devices or literacy, or for people with disabilities.
- » **Digital technologies allow for scaling up of service provision** without increase in resources. The scalability of digital services delivered through digital platforms and ecosystems has fundamentally changed the creation of value and the value/cost ratio. Again, this characteristic has been key to enabling remote work, and remote learning under the COVID-19 pandemic.
- » **Digital technologies are combinatorial.** The services can be provided through ecosystems where public and private players participate in value creation. Access to ecosystems, platforms, and data are the key strategic assets, so the ability to lead in networks and across organizational boundaries is important.
- » **Digital technologies are ubiquitous.** Digital-enabled change is hitting most aspects of an economy and a society (at different rates) and the pace of change is accelerating.
- » **Digital technologies allow for two-way communication and general data collection at nearly zero cost.** The ability to store the data, analyse it and act upon the analysis is, however, not easy to achieve or without cost.

- » **Digital technologies allow for more personalization of services.** Using data to profile individuals at zero marginal cost, digital technologies allow for individualization rather than segmentation.
- » **Digital technologies create uncertainty.** Staff, citizens, and businesses are concerned that digitization and automation will lead to job losses. On the other hand, the digitally savvy generations challenge traditional hierarchies and leadership changing the game for attracting digital talents. This is especially true in the public sector, where attracting and retaining talent can be limited by pay scales and other structures that are less attractive than in the private sector.
- » **Risks in the digital age are interconnected.** Challenges such as COVID-19, climate change, and cyber threats are characterized by persistency, complexity, and interconnectedness. Digital technologies can both increase these risks and provide ways of mitigating or alleviating them – e.g., contact tracing apps for addressing COVID-19, smart grids for leveraging sustainable energy sources, and open data providing loopholes for cyber threats.
- » Digital technologies are led, on the public sector side, in Ministries of Digital Economy/ICTs, or in newly created digital agencies. Depending on the country's legacy in digital adoption, several inter-ministerial committees or taskforces including regulators, and representatives of society/industry, are typically part of **the leadership structure**.

Changes afforded by digital technologies, notably the provision of more tailor-made services that are always available (at a distance and at zero marginal cost), are a great opportunity for improving public services. However, the ability of these technologies to provide these services needs to be mobilized through the right leadership capabilities.

Leadership at all levels of the public sector, but especially strong leadership and sponsorship from the top of government, is a key factor that determines whether the digital transformation of a country, region, or city becomes a reality or remains an aspiration. While digital technologies allow bottom-up and emergent strategies to prosper, it is our belief that the primary change agents will be policymakers and digital leaders, and that they in particular have outsized influence on

## BOX 2

### Positioning Digital Leadership

“Limitations in how quickly enterprises can transition their culture is frequently identified as a constraint. While there are unquestionably cultural challenges, our view is that this is a symptom of gaps in leadership capabilities, notably envisioning, decision making, leading organizational development and relationship building. The nature of the disruptions and uncertainties is demanding both strength in leadership as well as new leadership styles. Many enterprises can exhibit great management capabilities but lack the leadership skills. Cultural constraint is all too often a convenient scapegoat masking these root causes.”

Source: Gartner, December 2019: Predicts 2020: Leadership Gaps, More Than Culture, Inhibit Digital Business Transformation

the success of transformation. Their roles must focus on forging alignment at all levels around the transformation initiatives, the new ways of working, and the cultural change necessary to work with speed and agility. They must anchor the transformation and drive change through bold and effective decisions. Strategy and execution are driven by leadership, so any digital transformation plan should include training of leaders in digital skills and in the continuous change of mindset. This continuous training will build leader insight and will ensure that their competencies are aligned with the needs of the digital transformation journey.

The leadership capability thus permeates and influences the other digital capabilities, as well as the enablers and structures that support digital transformation in a country, region or city.

## Dimensions of Leadership Excellence

Leadership excellence is a complex, many-faceted topic. Nevertheless, in an effort to simplify the topic within the limitations of this study, three dimensions have been selected: the leadership profile, the leadership role and the leadership behaviour.<sup>10</sup> Each of these are described in the sections below.

### THE LEADERSHIP PROFILE

Technology changes or digital disruption have, to varying degrees, affected countries, regions, and cities for decades, and many futurists, technologists, and consultancies predict that it will continue at pace or even accelerate in the foreseeable future. If this holds true, digital leaders are going to need to develop organizational capabilities to continuously imagine, deliver, and scale successive waves of investment in digital technologies, and they need to make sure that these investments are integrated in service delivery according to their digital vision and operating model. The changes that are caused by the availability of technology, listed above, place a special obligation on leaders to be adaptable, accountable, curious, inclusive, hands-on, collaborative across boundaries, innovative, and creative in problem solving and solution finding, thinking outside-in, and handling ambiguity.

The leadership profile reflects who the leader is i.e., what mindset he/she possesses and what knowledge and skills he/she has accrued. This leadership dimension includes the development of a digital first mindset, which is

described in the chapter on culture (chapter 4), while the specific knowledge and leadership skills necessary are expanded upon in this section.

**Knowledge and Leadership Skills:** *“The qualities of high-performing leaders are grounded in extensive knowledge of the general business environment; intimate understanding of their industry, company, and work group; and a strong sense of their organization’s strategy, culture, and values.”*<sup>11</sup>

Building on this quote, a leader in the digital era needs to build digital competencies in addition to his or her core proficiency. In other words, digital leaders need to build digital transformation capabilities that combine digital skills and business skills.<sup>12</sup> By combining digital and business skills and knowledge a leader will become able to perceive, imagine, understand, and prioritize the possibilities that digital provides. In this respect, digital refers not only to technology, but to business models, operating models, and ways of working, e.g., agile and design thinking.

To lead the diverse teams necessary for a successful digital transformation, a leader must build specific knowledge and skills that combined add up to the digital transformation capabilities. Bennet, Lewis, and Bennet (2015) suggest seven knowledge types that are particularly useful in the problem-solving, decision-making, execution, and feedback processes of complex situations. These skills are important, and even though they may not all be mastered at the same level, a digital leader must cover all areas at least partially. The research team has adapted and prioritized five<sup>13</sup> that we believe are critical to leaders, when driving the digital transformation journey:

- » **Strategic knowledge:** How to factor strategic and long-term considerations into decisions. This includes, but is not limited to, the ability to imagine the future, understand its meaning, and set a vision that both drives direction and focuses resources by limiting activities that do not support the vision.
- » **Action knowledge:** How to guide action, hands-on activities, and implementation. This includes tacit knowledge of how to manage oneself, manage others, and manage tasks. It also includes knowledge of how to drive the major organizational processes, i.e., creativity, problem solving, decision making; how to build consensus in complex systems to achieve

11 Bennet, Lewis, and Bennet. 2015. [https://www.researchgate.net/publication/282186310\\_Leading\\_with\\_the\\_Future\\_in\\_Mind\\_Knowledge\\_and\\_Emergent\\_Leadership](https://www.researchgate.net/publication/282186310_Leading_with_the_Future_in_Mind_Knowledge_and_Emergent_Leadership)

12 Westerman, G., Bonnet, D., and McAfee, A. 2014. *Leading digital: Turning technology into business transformation*. Harvard Business Press.

13 The knowledge types not prioritized include: 1) *Meta-knowledge*: Knowledge about knowledge, its creation, and attributes, and 2) *Descriptive knowledge*: Descriptive information

the desired results; and how to drive the implementation programs that are necessary to complete the digital transformation.

- » **Praxis knowledge:** How to gain insight into rules and how systems behave. This includes specialized functional knowledge and system knowledge. System knowledge includes understanding how decisions propagate through the system and thereby the consequences of implementing digital solutions.
- » **Research knowledge:** How to experiment and leverage evidence/data and theories, to provide guidance for comprehending phenomena, relationships, attributes, etc. This includes knowledge of why things happen and what is expected to happen, which will help guide expectation-setting and possibilities for digital transformation.
- » **Learning knowledge:** How to learn. This includes, but is not limited to, self-knowledge, understanding the leader's own strengths and weaknesses and the way to enhance or mitigate these.

To build expertise in these knowledge domains, leaders have a number of options including online learning portals, in-person or distance learning from universities, other learning institutions, or non-governmental organizations (NGO), and more intimate learning formats, such as mentorships and coaching.



## THE LEADERSHIP ROLE

The leadership role is defined by the objectives that come with the job. The leadership role in a whole-of-nation perspective extends the leader's responsibility for leading to businesses and citizens in addition to public sector employees. Leaders must, therefore, act as change agents and drive digital transformation across organizational and sectoral boundaries and engage all these stakeholders to build and maintain momentum.

**The why** **Explaining and communicating why digital transformation is necessary.** Leaders must explain why digital transformation makes sense, how it helps citizens, businesses, and the public sector achieve value and why individual citizens, business owners, line managers, and public sector employees should support the transformation and how they will benefit from it. This is the first step in effecting a change of mindset (cf. the section Developing a Digital Mindset). The need for ongoing communication cannot be emphasized enough, whether through digital tools or (paid/owned/earned) media – and the message needs to be adapted to each group of stakeholders. While the specific message requires thoughtful crafting, digital leaders can build on already established cultural norms created in recent years by smart devices, social media platforms, and open forums that are quite diffuse globally.

**The ambition and vision** **Describing vividly the goal of digital transformation and how long it will take.** Leaders must define the ambition and vision of the digital transformation and paint a rich picture of what a digitally enabled society will look like. Leaders must acknowledge that the vision will not be achieved in the short-term but will take years, while realizing that the vision itself will be a moving target. Indeed, leaders need to continually communicate the ambition and vision of the transformation throughout the journey – and be especially clear and open if the destination changes as external factors change or the leader learns more. Constructing the right vision and creating the right mix of technologies requires leaders to excel in two dimensions: the ability to lead the technological acquisition and integration into existing systems and the ability to transform the vision into action. The leadership style should clearly communicate the destination, maintain momentum, and support the digital transformation journey.

**The challenges and risks** **Enumerating and openly accepting the challenges and risks that digital transformation will entail.** Leaders must be open about the challenges and risks that digital transformation will create. These will impact all stakeholders differently and can involve anything from a requirement for new skills and ways of working, the risk of data breaches and risks to citizens' privacy, to the radical change of the foundation of whole sectors of business. Being candid about the challenging journey of transformation that the country, region, or city is embarking on, keeping an open communication channel for feedback and

providing avenues for co-creation that ensure citizen-centricity, will help the stakeholders accept the changes and provide better time to adapt.

**The consequences** **Getting a clear view of the consequences of digital transformation.** As the journey progresses the consequences of digital transformation become clear. Leaders must communicate with key stakeholders, whether middle management in government agencies, business leaders, or NGOs, to help them deal with such consequences. These can be anything from the need for reskilling, and the need for policy or rules changes, to the need for further resource allocation. Providing a channel for ongoing dialogue with key stakeholders allows them to provide feedback so that changes can be made, and support provided, in a timely manner.

The digital leadership role can thus be summarized as a change management role, which aims to build consensus, foster collaboration and coordination, and develop buy-in for the digital transformation of the country, region or city, while leveraging the resources found not only in the public sector, but also in the private sector and society at large.

## THE LEADERSHIP BEHAVIOR

The behaviour of the leadership is an important part of the cultural change necessary for the digital era. Digital leaders need to “Walk the Talk” or “Show not Tell” to exercise authentic and accountable leadership.<sup>14</sup> They need to embrace technologies in their own work praxis as well as inspire change in behaviour throughout the organization and embed these digital work praxes in processes and culture.

As the country, region, or city embarks on the digital transformation journey, the leader needs to display and encourage distinct behaviours that will help guide their organizations and society through the change. As Peter Drucker, management thinker, stated: “*Management is doing things right; leadership is doing the right things*”. Leaders that embark on a digital transformation journey must master both.

The behaviours listed below are not an exhaustive list but are based on a synthesis and adaptation by the research teams of numerous sources, including Deloitte,<sup>15</sup> Gartner,<sup>16</sup> and MIT Sloan Management Report,<sup>17</sup> and while they represent some of the behaviours that are necessary to complete a successful

---

14 Senge, P., Kleiner, A., Roberts, C., Ross, R., Roth, G., Smith, B., and Guman, E. C. 1999. The dance of change: The challenges to sustaining momentum in learning organizations. *Performance Improvement*, 38 (5): 55-58.

15 Bourke and Dillon, Deloitte Insights, 2016.

16 Panetta, Gartner, 2019. <https://www.gartner.com/smarterwithgartner/5-steps-to-become-an-effective-digital-leader/>

17 Mukherjee. 2020. <https://sloanreview.mit.edu/article/5-musts-for-next-gen-leaders/>

digital transformation, they are not digital in nature and are thus also relevant for leaders of transformations not involving digital.

### **Be a Change Agent**

In MIT Sloan Management Review, Monahan, Chmiola, and Roos (2017)<sup>18</sup> identify a leader's ability to take risks and accept failures as one of the key factors in successful digital change. This ability is indeed critical for success in a fast-changing environment, on a journey with a somewhat unknown future destination, where organizations must perform tasks they have never done before, e.g., as is the case during the COVID-19 pandemic. However, the ability to take risks and accept failures often does not fit well with the culture of many public sector organizations. This puts an even greater onus on the strength of the mandate given to the leader and the ability of the leader to be a pioneer and embody the new digital leadership paradigm. One of the other leadership traits identified is openness to feedback and two-way communication. This will make it easier for direct reports, whether middle management or front-line practitioners to emulate the leader and stand fast in the face of adversity. Thus, leaders are the key to inspiring cultural change if they are willing to pioneer these new methods as examples to their employees. They must themselves be agile and nurture risk tolerance, take risks, and learn from the outcomes.

### **Clearly Define the Priorities**

To allow organizations and societies to navigate during a time of change or even disruption it is necessary to understand the underlying priorities. In spite of digital transformation journeys often having a somewhat unknown destination it is important to communicate the current priorities – and for leaders to clearly communicate as priorities shift - and how success will be measured. Thus, setting clear goals and communicating them can help employees, businesses, and citizens track progress and understand their role in achieving the vision for digital transformation. Also, showing a willingness to adapt goals and priorities, when circumstances dictate it, will strengthen credibility during the transformation.

### **Embody Citizen-Centricity**

Governments have historically decided how best to provide services to groups of citizens, but more and more citizens expect government to deliver services in a responsive and equitable manner. This means that where public sector organizations may in some cases be prone to focus on their own, internal logic, when designing or operating public sector services, the main imperative in a citizen-centric digital transformation is not to fit operational structures and processes to the requirements of government departments, but to serve citizens—who are considered the main stakeholders. Consequently, the leader needs to be the user's ambassador, whether that user is a citizen, a business, or one of the leader's staff. When leaders listen and empathize with citizens'

---

18 "How Effective Leaders Drive Digital Change", Monahan, Chmiola, and Roos, MIT Sloan Management Review, 2017.

needs and challenges this may trickle down to the rest of the organization and over time be internalized and effect a cultural change that improves the chance of success in digital transformation. Embodying citizen-centricity also involves an increased degree of delegation as decisions related to providing value to citizens are best informed by those who are closest to them. Delivering citizen-centric government services also requires leaders that view digital transformation through an ecosystem lens. Seamless, citizen-centric services are not necessarily delivered using only public sector resources. Consequently, leaders should adopt a cross-sectoral and cross-ministerial perspective to digital transformation – leveraging the skills and resources of academia, NGO's, the private sector and society at large to deliver citizen-centric services.

### Practice Inclusive Leadership

A digital transformation journey impacts many stakeholders internally in the public sector and in the market and civil society. To ensure the changes that digital transformation brings do not disproportionately favour or disfavour certain groups it is necessary to involve a broad swath of the stakeholder landscape.<sup>19</sup> The traditional hierarchical leadership structure is not sufficient, and leaders must identify and involve influencers (within their own unit, other agencies, in business, and among citizens) who have first-hand experience in the areas that digital transformation is attempting to change. The leader must, consequently, practice a leadership style that focuses on collaboration and teamwork – combining different competencies and backgrounds and fostering new mindsets, training in new skills, and providing new tools and technologies – in the effort to drive new behaviours and outcomes. Inclusive leadership also extends to digital ecosystems, creating new partnerships with business and civil society around platform-based service delivery and engagement models that can attract the digitally savvy talents.

### Build a Team and Share Accountability

As the digital transformation builds momentum and brings together competencies and resources from across the country, region, or city, accountability cannot and should not rest exclusively with the leader. Everyone has a role to play in future-proofing society. All stakeholders, whether state, market, or civil society, and whether reporting to the digital leader or to one of his/her peers, have to understand and accept that they play a part in achieving the vision and are accountable for it. To help facilitate this teaming and common accountability it is important to build a common vocabulary – one that embraces the new ways of working and blends the vocabulary of all the competencies and units that contribute to achieving the vision. This shared language should not be

---

19 Olphert, W., and Damodaran, L. 2007. "Citizen participation and engagement in the design of e-government services: The missing link in effective ICT design and delivery." *Journal of the Association for Information Systems* 8 (9): 27.  
And Rowley, J. 2011. "E-government stakeholders—who are they and what do they want?" *International Journal of Information management* 31 (1): 53-62.

technical but strategic: it should include the vocabulary necessary to be part of the digital journey (e.g., the terminology of agile development methods), but more importantly, articulate the vision and goals of the transformation in terms that everybody can understand.

### Prepare for the Future of Work and Workforce

According to a Gartner survey among CIO's, executives cited talent and leadership as one of the top reasons for success, but also a lack thereof as a major cause of underperformance in digital business investments and initiatives. CIOs identified the lack of skills and resources as the biggest barrier to their success. CIOs recognize their current IT workforce is in urgent need of developing digital competencies critical to digital businesses.<sup>20</sup>

Emerging technology including automation, artificial intelligence, and robotics are going to be able to execute tasks of increasing complexity. These tasks will not be limited to manual tasks but will also be in the domain typically called knowledge work. In the short- to mid-term, the tasks influenced by these technologies will remain limited in scope. Leaders will lead a hybrid workforce where both human workers and robotic workers will cooperate to complete activities. Leaders will likewise be aided in their management by technology. These hybrid configurations will require reskilling, reorganizing, and re-visiting roles in society.

In preparing the organization and the workforce for the future of work, many issues have to be addressed. Building and sustaining a successful organization in digital ecosystems requires a shift in mindset and practices, and on putting the right supportive policies in place as reported in WBG's report on The Future of Work in Africa (Choi et al, 2020). Leaders must define desired behaviours and develop the underlying competencies in the workforce to make the shift.<sup>21</sup>

Best practice suggests that explicit organizational strategies for competencies, attraction of talents, organizational adaptation, and leadership training are required skills, not only in the leaders but throughout the organizations for successful transformation into hybrid organizations made up of a combination of human workers and automated processes or robots. How to acquire these skills is described in chapter 3: Digital Skills.

---

20 Gartner, September 2020: Develop the Competencies Your Workforce Needs for the Digital Ecosystem

21 Op.cit Gartner, September 2020m

## An Institutional Perspective on Digital Leadership

Organizations are made up of individuals, and public sector leaders have a strong impact on the country's, region's or city's ability to implement a digital transformation. However, the leaders work within the structure of existing government institutions and governance models, which can further or hinder the digital transformation of the country, region or city. Consequently, digital leaders must work to define the national priorities for digital transformation and what, if any, changes are required to government institutions and governance models.

The first priority must be to determine the desired digital transformation strategy and which institutions and governance models are required to facilitate the desired digital transformation.

### POSSIBLE DIGITAL TRANSFORMATION STRATEGIES AND THEIR IMPLICATIONS FOR PUBLIC INSTITUTIONS

With a clear line of sight to national priorities for digital transformation, leaders must facilitate the creation of a digital economy. One option is to aim at improving the effectiveness and efficiency of the state. A second option is for leaders to channel considerable resources into improving the digital framework conditions for businesses – providing the regulation, data, services, and infrastructure necessary to foster a digital economy, and letting the remainder of the public sector and civil society follow the market's lead. A third option is for leaders to focus on lifting the skills and services provided in civil society and thereby build a demand for more digital service across the public and private sector, thereby lifting the entire society. In an ideal world, countries, regions, and cities would prefer to do all three, but few organizations have the leadership bandwidth and resources to drive such massive changes simultaneously. Consequently, leaders must make selections and deselections to prioritize scarce resources.

If option one is selected, where the effectiveness and efficiency of the state is the focus of digital transformation, then several pathways are available. Based on a review of literature and interviews with experts internal and external to World Bank Group this study has attempted to categorize a number of archetypical digital transformation strategies and the institutions that support them:

### Strategic and Vision-led Transformers

These countries, regions, or cities develop a clear roadmap, set priorities, and create a central role and/or unit to drive the transformation – providing more or less central support to other agencies, businesses, or civil society. Of the OECD countries surveyed in 2016,<sup>22</sup> many had opted for one or more agencies to lead the development, though only few have vested responsibility with a single high-level government official. A variation of the strategic transformers does not vest responsibility in one agency or ministry but develops a common vision and ambition and make it the responsibility of all agencies or units to take a “digital first” perspective on providing services and regulating the market and civil society.

### Sectoral Transformers

These countries, regions, or cities choose to husband their resources and focus on transforming one or more sectors, harvesting quick wins. Then these exemplary cases are used as beachheads from which to drive wider digital transformation first to other sectors, and then across the country, region, or city. A digital agency or department within the sector is vested with the authority and resources to build sector-wide solutions.

### Leapfroggers

Many leading countries, regions, or cities have followed a linear digital maturity development as technology and thinking progressed from what OECD calls analogue government via e-government to digital government. The linear development model is not, however, the only path to digital government. It is possible for countries, regions or cities to leap one or more maturity step by leveraging new technologies and business models, thereby enabling more flexible and decentralized systems of delivery that do not follow the traditional path of digital development.<sup>23</sup> To achieve sustained, successful leapfrogging government, private sector, and civil society are to demonstrate strong capabilities in implementation, change management and a change in culture. These elements, unlike technological solutions, are the direct result of behaviours and routines. Consequently, public sector leapfrogging – in such areas as telecommunications regulation or democratic performance (transparency and levels of public participation) – will require public institutions with the mandate and resources to make bold decisions such as investing in less proven technologies or approving new business models.

<sup>22</sup> OECD. 2018. Going Digital.

<sup>23</sup> Leapfrogging also applies to the market, where Professor Amit Joshi of IMD Business School argues that India has leapt an industrial era market economy directly to a digital era economy in certain sectors. Joshi, A.M. 2017. <https://www.imd.org/research-knowledge/articles/the-great-indian-leapfrog/>

## DIGITAL TRANSFORMATION GOVERNANCE: AN EMERGING MODEL

Arriving at a strategy for digital transformation can be done using numerous different processes and methodologies such as future search, scenario planning, and ideation. However, regardless of the strategy that is chosen, it will require leadership to ensure alignment and encourage followership. In addition, to provide structure for this transformation leadership, it is necessary to design and implement an effective digital transformation governance model. By governance we refer to *“the manner in which power is exercised in the management of a country’s economic and social resources for development.”*<sup>24</sup>

In general, digital transformation governance can be placed on a number of continuums that range between centralized and decentralized control, public and private delivery, innovation and maintenance, personalization and standardization, and sector-specific and whole-of-nation. There is no one-size-fits-all model, as there are trade-offs for each placement on these continuums – centralized control makes it easier to provide direction, but may disenfranchise local stakeholders, while decentralized control can empower local stakeholders, while resulting in numerous initiatives that are not coordinated. It is important that these choices and trade-offs are made explicitly, rather than by inheriting previous choices or simply by neglect.

A single model for best practice digital era governance has yet to emerge. As early as 2006, Dunleavy et al.<sup>25</sup> proposed a digital era governance model to replace New Public Management, however, it and several other proposed governance models have yet to be fully embraced.<sup>26</sup> Nevertheless, some elements, borrowed from the private sector, seem to enjoy nearly universal acceptance:

- » **Customer or citizen-centricity** – i.e., organizing public services around citizens’ or business’s needs.
- » **Flexible (or no) hierarchies** – i.e., sharing expertise across organizational units and engaging with partners and citizens to solve problems
- » **Regular Involvement and Feedback from Customers (Citizens)** – i.e., able to continuously engage citizens in solving problems along the journey and to leverage that feedback to adapt the solutions to better address their needs.
- » **Whole-of-Nation Perspective and Accountability** – i.e., able to address challenges across organizational units or silos – ignoring or downplaying

---

24 World Bank. 1992. “Governance and Development”. Washington, D.C.

25 Digital Era Governance: IT-Corporations, the State and E-government, Oxford University Press, 2006.

26 Unbounded government – Opportunities for developing new government practices.

jurisdictional or sectoral boundaries, including boundaries between public sector, private sector, and NGOs, and engaging citizens. An example of this perspective would be Singapore’s *Smart Nation and Digital Government Group*<sup>27</sup>

- » **Bimodal** – i.e., able to both exploit novel ideas and technologies to address new problems in an unpredictable environment and to efficiently operate well-established solutions to solve well-understood problems in a predictable environment.
- » **Open data** – i.e., use of public data by private entities and citizens

These elements should be considered and potentially incorporated when a model for governance of the digital transformation is designed.

Roman argues that “[i]n order for e-government to deliver on its original promises it needs to fulfil expectations along three broad dimensions: security, functionality and transformation” and that major failures on any of these dimensions can seriously jeopardize the digital transformation journey.<sup>28</sup> So if citizens do not feel that digital solutions are secure, that digital solutions provide valuable functionality, or that the public sector is transformed for the better through the use of digital solutions, then the digital transformation journey will lose legitimacy and potentially fail. Consequently, good governance of the entire transformation process, including delivering on the promises of security, functionality, and transformation, is critical for increasing the digital maturity.<sup>29</sup> This government-internal perspective can be expanded with a society-wide perspective as described by Kumar, Kumar, and Kumar: *E-governance is a decisional process which involves ICT in governance with the objective of wider participation and deeper involvement of citizens, institution, NGOs and other companies*.<sup>30</sup>

In the analogue era, governance was clear: roles, responsibilities, and accountability were well-defined, and investments and initiatives could be assessed through exhaustive analysis and business cases. In this world, the final product

---

27 The group is responsible for i) applying digital and smart technologies to improve citizens’ lives in key domains, in partnership with other government agencies, industry, and the public; ii) developing the digital enablers and platforms to grow economic value and catalyse innovation by companies and citizens; and iii) driving digital transformation for the public service and building up digital capabilities within government. <https://www.pmo.gov.sg/Newsroom/formation-smart-nation-and-digital-government-group-prime-ministers-office>

28 Roman, Alexandru. “Realizing E-government: Delineating implementation challenges and defining success”, 2013.

29 Lisa Welchman argues that digital governance is the system of decision making, accountability, and roles for a country’s or organization’s digital presence and delivery around a set of key digital elements, such as technical decisions on digital platforms, and investment decisions on digital infrastructure, etc. (Welchman. 2015).

30 Kumar, Kumar, and Kumar. 2014. E-Governance in India: Definitions, Challenges and Solutions. <https://arxiv.org/ftp/arxiv/papers/1411/1411.1876.pdf>

or service was defined and fixed in the early stages of development and, once ready, exploited for a long time.

In the digital era, governance models must be geared to make decisions more quickly and adapt rapidly to changes in the environment and citizen needs, and to new technologies becoming available. The nature of citizen-centric digital transformation is that it follows the needs of the citizen rather than the internal logic of the government structure. As such teams and resources must be gathered from across several business units and locations – inside and outside of the public sector, something that many organizations, whether public or private, are unused to fielding.

Dunleavy and Margetts, building on their model for Digital Era Governance from 2006, in 2015 suggested a number of “Do” and “Choice” principles as a framework for administrative and service design, calling it an “Essentially Digital Governance” (EDGE) model.<sup>31</sup> The model is aimed at government emerging as a *“tight central core of intelligent bureaucracy, setting strategy, architecture, procurement and governance on a pluralistic open innovation platform.”*<sup>32</sup> They go on to argue *“[u]ltimately, the development of EDGE will depend on the capacity of policy-makers to import and emphasize the cultural influences that go with the grain of technological trends, rather than against it.”*<sup>33</sup>

Dunleavy and Margetts suggest that governments should design their administration, services, and policy-making apparatus based on the principles seen in Figure 2 and propose a model of state design with an intelligent core that is informed by big data and focused on policy design, and a devolved delivery organization that leverages internet-based platforms to deliver services. However, they do not elaborate on the concrete structures that need to be in place for this model to be implemented, and consequently, we examine these based on private sector experience.

---

31 Dunleavy and Margetts. 2015. “Design Principles for Essentially Digital Governance.”

32 Ibid

33 Ibid

**FIGURE 2**

**“Do” and “Choice” Design Principles for Essentially Digital Governance.\***

Derived from: Dunleavy and Margetts, “Design Principles for Essentially Digital Governance”, 2015



**Experiential learning**

This principle would involve a build-and-learn approach, moving away from the idea of government as a finished product, but trialling policies and services on citizens and adjusting in response to the findings.



**Provide formal rights and real redress**

This principle means recognizing that administrative or technical protections will not be enough. Citizens need explicitly digital rights to privacy, data protection, freedom of information, access to digital channels and minimum information collection.



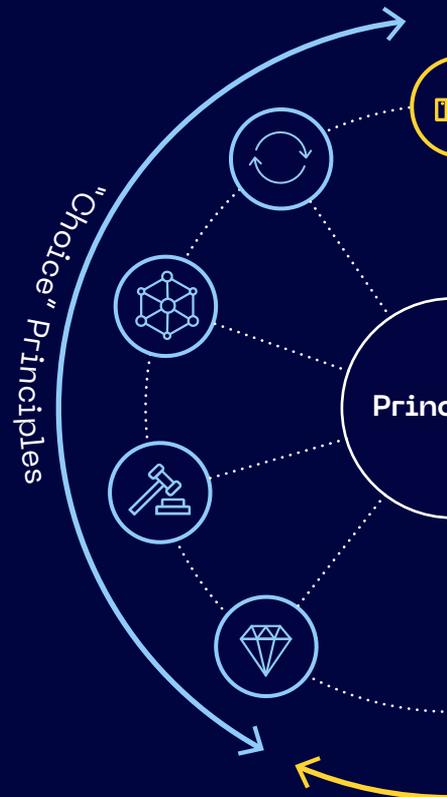
**“Keep the state nodal” obligation**

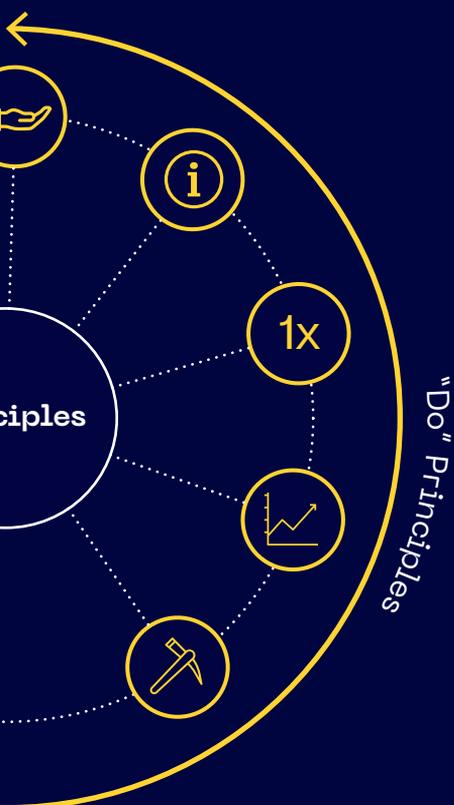
This principle means that government should come to citizens rather than citizens coming to government – providing information and services in citizens’ ‘timestream’ [e.g., social media flow], rather than expect people to search for and come to government websites.



**Experiential learning**

This principle would involve a build-and-learn approach, moving away from the idea of government as a finished product, but trialling policies and services on citizens and adjusting in response to the findings.





### Deliver public services for free

This principle builds on the fundamental shift in what people expect to pay for brought on by citizens' widespread use of the internet. Paying for access to data is no longer automatically accepted.



### Use already existing digital information – non-obtrusively

This principle means that if business and civil society organizations already produce information in digital form, government should tap into and use that.



### Do it once

This principle would mean that government should plan, procure, and provide services once – not many times, not even twice. That can imply services that are planned, procured or provided at the maximum scale, for example at the national level, or even the supra-national level.



### Grow scalable services in competition

This principle leverages the opportunity that the internet, cloud computing and mobile-based application platforms make it possible for innovations to be introduced on a small, modular scale and scaled up across millions of users.



### Isocratic (DIY) administration

This principle would involve a much more systematic approach to using the willingness of citizens to both engage with government policy and services and to manage their own affairs (do it yourself, DIY), at two levels: At the individual level, this would mean citizens manage their own affairs with government. At the collective level, co-production would involve crowdsourcing.

## DESIGNING A DIGITAL TRANSFORMATION GOVERNANCE MODEL

The Massachusetts Institute of Technology (MIT) IT Centre for Digital Business and Capgemini Consulting's Joint Research Program on Digital Transformation<sup>34</sup> identify three new digital challenges that digital governance models must address, and though the research is based on a private sector perspective, we believe the challenges in the public sector are similar:

- » **Faster and more integrated business cycles:** Mobile apps, collaboration networks, connected products or social media create new business opportunities and more challenges for security, regulatory compliance, and legacy system integration – all in an environment of faster business cycles. From a public sector perspective, the same developments provide opportunities for new and/or more efficient services, and similar challenges.
- » **New risks:** Brand (or trust) exposure on social media, and confidentiality breaches and regulatory breaches are relevant risks for both public and private sector organizations.
- » **Increased demand for cross-silo capabilities:** The need for integrated data and employee collaboration is equally challenging in the public and private sectors.

### BOX 3

#### Digital Leadership in the UK

The UK's Government Digital Service (GDS) is composed of small, agile teams of digital experts, including product and project delivery managers, developers, designers, and content creators. The GDS has also led the recruitment of digital leaders into positions across government, mainly from the private sector. They oversee the deployment of, and migration to, digital content and services, training and reskilling of existing civil servants, change management and process optimization, as well as the human and organizational requirements for communication, coordination, collaboration, participation, and continuous improvement.

MIT and Capgemini go on to identify three core elements of digital transformation governance necessary to answer these challenges: Shared digital units, governance committees, and new digital roles.

**Shared Digital Units:** Among the OECD countries, 96 percent have established coordination units at the central government level.<sup>35</sup> In addition, numerous countries have established shared services units with remits stretching from the strategic to the operational. For example, New York City's Office of Data Analytics was launched in 2013 to work with city agencies and show how data can solve city problems. In Estonia, the government will approve funding for digital projects that overlap across departments only if the proposal promises cross-department collaboration. Furthermore, in South Korea, the government's

34 MIT-CDB and Capgemini Consulting, "Governance: A central component of successful digital transformation", [https://www.capgemini.com/wp-content/uploads/2017/07/Governance\\_A\\_Central\\_Component\\_of\\_Successful\\_Digital\\_Transformation.pdf](https://www.capgemini.com/wp-content/uploads/2017/07/Governance_A_Central_Component_of_Successful_Digital_Transformation.pdf)

35 OECD. Effective Organisational & Governance Coordination Framework. <http://www.oecd.org/governance/digital-government/toolkit/principle7/>

Knowledge Sharing Program (KSP) is a robust platform of government best practices and cooperation. It encourages collaboration by pooling resources across agencies and increasing budget allocations based on successful, collaborative implementation of deliverables.

**Governance Committees and Governance Design:** Leading countries have adopted numerous different ways of coordinating and prioritizing digital initiatives and driving the digital transformation. Some, such as Denmark, have implemented whole-of-government digital steering committees, e.g., a steering committee for common digital solutions, one for common digital communication with citizens and businesses, and one for emerging technologies and better use of data. Others have established sector or domain steering committees to answer the critical questions necessary to embark on a digital transformation journey.

**New Digital Roles that Support the Business Leader and Facilitate Digital Transformation Governance:** At each layer of government, new roles may be relevant in order to coordinate and drive digital transformation. They will need to work and collaborate both vertically and horizontally across the public sector as well at the 'edges' of private and community sectors. The specialist roles below are illustrative archetypes, derived from implementation in private sector, and may, dependent on scale and available resources, be merged, so one person fills two or more of the CxO<sup>36</sup> roles described.

**Digital Era Government must Offer Governance of Digital Platforms:** As digital platforms such as Amazon, Facebook, Alibaba, and Google become ever more widespread there is a need for government to take an active part in regulating citizens', businesses' and the government's own interaction with the platforms. Demos Helsinki, in their analysis of digital era government (Demos Helsinki, 2018), argue that there is a need for governments to act "as a regulative platform – for people, for organisations, and for platform companies." This regulatory platform must ensure governance of interfaces with the platforms (i.e., application programming interfaces that allow third parties to work with the platforms), prerequisites to access and to exit services (e.g., the portability of data and the right to be forgotten), transparency of algorithms and decision-making (e.g., basis for credit allocation or friend suggestions), ownership of data streams (e.g., who owns a twitter-feed, and who can the platforms share data with), taxation (e.g., how is local value generation taxed). The digital platforms are by nature transnational, if not global, and this makes it particularly difficult for countries, regions and cities to look after their citizens' and businesses' basic rights. Nevertheless, digital platforms are not just a cause

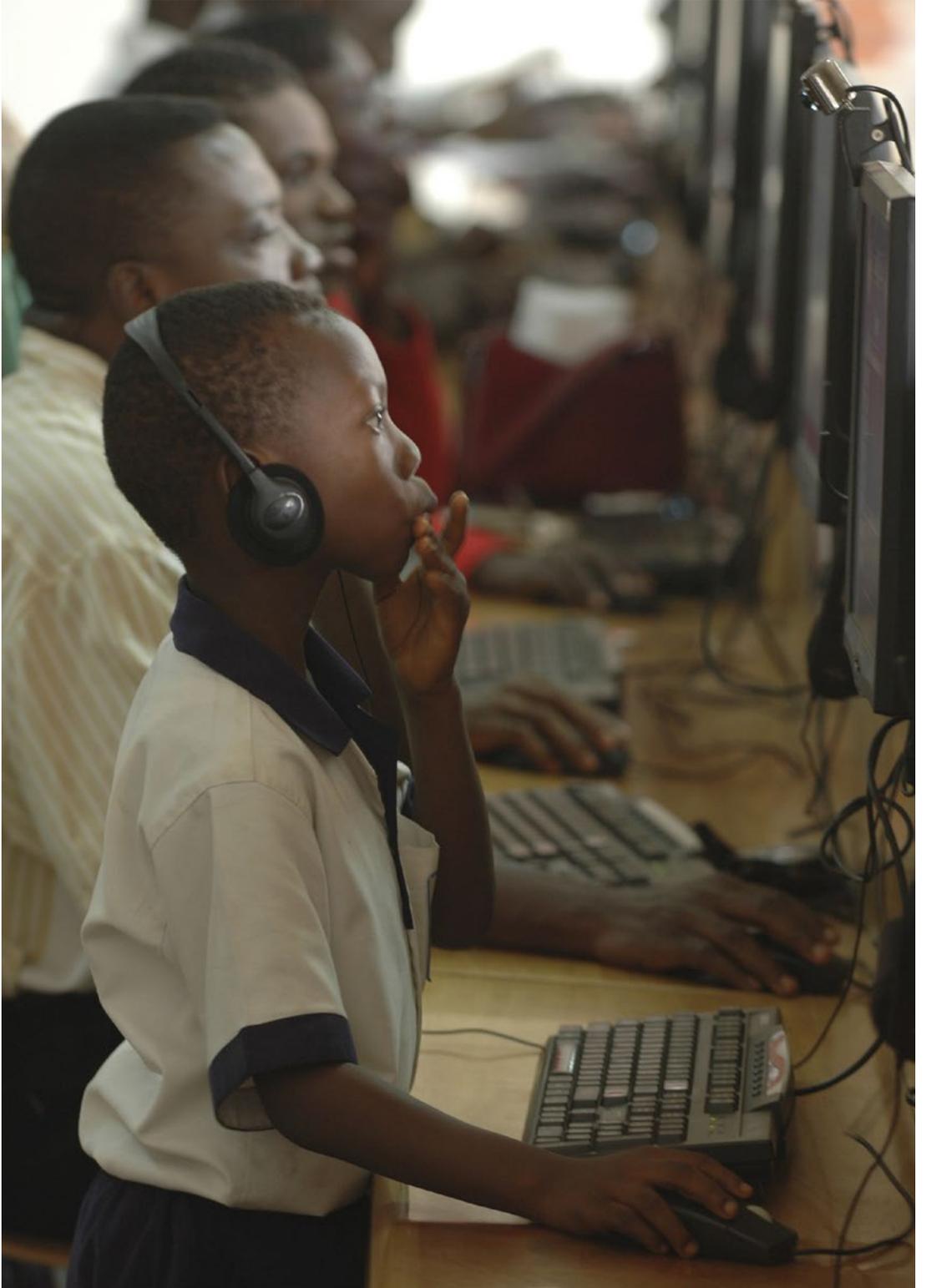
for concern or regulatory challenge, but also a possible source of data about citizens’ and businesses’ needs. Consequently, digital leaders will need to engage with the platforms to provide true digital era governance that benefits all the stakeholders.

**TABLE 1**  
**Specialist roles for digital transformation (Source: WBG research)**

CXO ROLES	DESCRIPTION	BENEFITS
<b>Chief Information Officer</b>	A government CIO is responsible for imagining, developing, and running the IT-infrastructure and applications that will support the use of government data and provide services to citizens and businesses.	Investments in information technology within the government are coordinated, standards are set, and major moves such as a transition to cloud can be facilitated.
<b>Chief Data Officer</b>	A government CDO (Data) is responsible for the asset represented by public sector data. As with all assets data must be both maintained and leveraged in order to gain full value.	Value is extracted from available public data – both within the public sector and in society as a whole, e.g., through open data initiatives. CDO’s are expected to manage the algorithmic risk as AI-based solutions proliferate.*
<b>Chief Digital Officer</b>	A government CDO (Digital) is responsible for transforming public sector services, business models, and citizen-facing ways of working using digital technologies.	Ensures that investments in digital technologies are not solely focused on improving the internal efficiency of the public sector, but also benefit citizens and businesses through better quality service.
<b>Chief Information Security Officer</b>	A government CISO is responsible for safeguarding the public sector from harmful digital risks, including risks to data.	As digital solutions become more and more critical to the public sector and to society in general, a CISO can provide the necessary focus on safeguarding critical digital infrastructure and content and thereby maintaining trust.
<b>Chief Technology Officer</b>	A government CTO is responsible for introducing relevant, value-adding technologies to the public sector.	New technologies are introduced as they become available and leapfrogging from older technologies to new is made possible. The CTO is seen as the agent of change in a recent EY study.**

\* Deloitte Insights and Beeck Center for Social Impact at Georgetown University. 2018. Chief Data Officer in Government, A CDO Playbook. [https://www2.deloitte.com/content/dam/insights/us/articles/5004\\_CDO-Data-strategy/DI\\_CDO-in-govt-playbook.pdf](https://www2.deloitte.com/content/dam/insights/us/articles/5004_CDO-Data-strategy/DI_CDO-in-govt-playbook.pdf)

\*\* Ernst & Young. Agents of Change. [https://www.ey.com/Publication/vwLUAssets/EY\\_-\\_How\\_government\\_CTOs\\_can\\_drive\\_digital\\_transformation/\\$FILE/EY-government-CTO.pdf](https://www.ey.com/Publication/vwLUAssets/EY_-_How_government_CTOs_can_drive_digital_transformation/$FILE/EY-government-CTO.pdf)



# 3 Digital Skills

This chapter begins with a discussion of the definitions and conceptual frameworks underlying digital skills, followed by a presentation of the modalities of developing digital skills through the formal education system, through the corporate sector, and through informal channels. It highlights the specific needs of civil society and vulnerable populations which have to be addressed urgently to create an inclusive digitally enabled society for all demographics. The chapter concludes with an assessment of what governments can do to develop digital skills for the entire population, along with some insights on the role of partnerships between the private sector and governments, as a pathway for promoting the digital skills of citizens, employees, and vulnerable populations.

## Digital Skills Definitions and Frameworks

Ever since digital technologies have become widespread, concerted efforts have been made to develop the concept of digital skills. As early as 2004, DiMaggio et al. distinguished between the skills required to use digital technologies and those for adopting, adapting, and creating digital technologies, as well as “digital skills for all” and “digital skills for ICT professionals”.<sup>37</sup> Further refinements of these concepts were based on the recognition that countries require both a *digitally competent workforce* (for general occupations and for ICT professions) as well as *digitally literate citizens* who could reap the benefits that a digital society brings.

A digitally competent workforce, comprised of both workers with basic digital skills and ICT technicians and engineers, is necessary to support the installation of digital infrastructure, but more importantly to drive the adoption of digital services across multiple sectors. Without widely dispersed competences in the workforce and the population as a whole, the adoption of digital technologies will not have the full transformative impact. Digitally literate citizens drive demand for digital services and can reap the benefits of digital governance, information, and knowledge from across the world, and engagement with the wider community.

An article by the European Commission<sup>38</sup> indicates that there has been little effect on the aggregate number of jobs that are predicated on the technological change so far. However, it is also anticipated based on current estimates

---

37 P DiMaggio, E Hargittai, C Celeste, and S Shafer. 2004. Digital inequality: From unequal access to differentiated use, in *Social Inequality* (Russell Sage Foundation).

38 [https://ec.europa.eu/knowledge4policy/foresight/topic/changing-nature-work/technological-progress\\_en](https://ec.europa.eu/knowledge4policy/foresight/topic/changing-nature-work/technological-progress_en)

that AI-enabled technology may expand the scope of job automation in the future and that the net effect could be anywhere from 2 billion jobs lost to 375 million jobs gained by 2025/2030. The emergence of IoT and AI-enabled work environments that are driving the implementation of smart homes, AI doctors, virtual secretaries, and more, present potential opportunities for leveraging digital skills for citizens, public servants, and private sector employees.

Approximately five new complementary jobs are created for every additional technology job. This creates huge opportunities for new types of jobs and the evolution of new types of digital skills to perform these jobs. Some of the opportunities highlighted in the beforementioned article include:

- » Jobs requiring continued use and maintenance of new technologies.
- » Programmers and specialists in robot maintenance, with a focus on manufacturing of robots or provision of support services in the area of robotics.
- » The service and knowledge work sector could grow by around 50-60 per cent by 2030, mainly driven by the fact that AI capabilities are limited and unable to fully replace human interaction.

Almost all OECD countries, and some Asian and Latin American nations have developed frameworks to support the development of education and training as well as measurement of digital skills in the population. A broad distinction has been made between general digital skills (for citizens and most occupations) and skills for the ICT professions. For private sector employers, the widely used McKinsey model splits skills into three categories, i.e., technological skills, digital citizen skills and classical skills<sup>39</sup>.

For public sector, the most comprehensive and widely used framework is the European Union's DigComp 2.0 and its more recent update DigComp 2.1 (2017).<sup>40</sup> Adapting this framework to developing country contexts and in line with the Sustainable Development Goal on digital literacy,<sup>41</sup> UNESCO's Institute of Statistics has further developed a Digital Literacy Global Framework (2018).

Under this framework, digital skills can be defined as the individual capacity to access, manage, understand, integrate, communicate, evaluate, and create information safely and appropriately, using a variety of digital technologies. The expanded framework covers seven domains/competences and eight proficiency levels, broadly grouped into four categories: Foundational, Intermediate, Advanced and Highly Specialized. The proficiency levels reflect "*the cognitive*

39 <https://www.mckinsey.com/industries/public-sector/our-insights/the-future-is-now-closing-the-skills-gap-in-europes-public-sector>.

40 DigComp 2.1 contains no conceptual updates to DigComp 2.0 competence areas and competences but it includes updates on proficiency levels and examples of use.

41 Sustainable Development Goal Thematic Indicator 4.4.2: "Percentage of youth/adults who have achieved at least a minimum level of proficiency in digital literacy skills".

*challenge, ... the complexity of the tasks as well as ... autonomy in completing the tasks*" (Carretero et al. 2017). For the majority of occupations and to enable citizens to participate in a digital economy and society, "intermediate" proficiency levels in the majority of domains is increasingly considered essential, especially among young people.

Skills for the ICT professions require a separate framework because of the deeply technical, and creative nature of the professions. The European Union's e-Competence Framework 3.0 provides a useful reference that covers 40 competences and five proficiency levels, ranging from the vocational-technician level to the highly qualified engineer, programmer, and software developer. The Skills for the Information Age (SFIA) framework is a globally recognized model for describing and managing skills for ICT professionals. Frameworks have also been developed for specific occupations. One such example is the UNESCO ICT Competency Framework for Teachers.<sup>42</sup> It is intended to guide pre-service and in-service teacher training institutions and teachers themselves on the use of digital technologies in education.

A digital skills framework is relevant for policymakers to promote and enhance digital skills for citizens and the workforce. The frameworks have to be translated into learning designs to be useful for employers, students, teachers, and business leaders. To maintain relevance, they need to be adapted to local contexts and regularly updated, due to rapid advances in technology. This is a major challenge for developing countries that lack the funds and resources to do this systematically. One easy way to start is to use global frameworks and customize them to the country context in consultation with local stakeholders.

**TABLE 2**  
**UNESCO/EU DigComp 2.1 Digital Literacy Framework**

<b>Domains</b>	<ul style="list-style-type: none"> <li>• Devices and software operations*</li> <li>• Information and data literacy</li> <li>• Communication and collaboration</li> <li>• Digital content creation</li> <li>• Safety</li> <li>• Problem solving</li> <li>• Career-related competences*</li> </ul> <p style="font-size: small; margin-top: 5px;">*Included in UNESCO-UIS Digital Literacy Global Framework</p>
<b>Proficiency Levels</b>	<ul style="list-style-type: none"> <li>• <b>Levels 1-2, Foundational:</b> With guidance, deal with simple tasks that involve remembering contents and instructions</li> <li>• <b>Levels 3-4, Intermediate:</b> Independently deal with well-defined routine and nonroutine problems that involve understanding contents</li> <li>• <b>Levels 5-6, Advanced:</b> Independently deal with and provide guidance to others on different tasks and problems that involve applying and evaluating content in complex situations</li> <li>• <b>Levels 7-8, Highly Specialized:</b> The person is a professional who is contributing to technical-scientific knowledge in that domain. Independently resolve complex problems with moving pieces, guide others, contribute to professional practices and propose new ideas to the field.</li> </ul>

An important point is that digital competences apart from the most rudimentary – such as using a mobile phone for voice calls or simple messages – cannot be developed without *foundational literacy and numeracy skills*. Some of the competences, such as communication and collaboration, and higher levels of proficiency in all competence areas, also require *socio-emotional skills*. Socio-emotional skills are behaviours, attitudes, and values, such as self-awareness, leadership, teamwork, self-control, diligence, perseverance, and motivation. Further, in many occupations, specific technical skills are required. Digital skills are therefore part of a more generic skills framework adopted by the World Bank, with three core components comprising cognitive, socio-emotional, and technical skills (World Bank, 2018). The digital skills framework cuts across these three skills components. Hence, while planning digital skills programs, these other skill components must be considered depending on the target groups. In particular, training in socio-emotional skills, which are transversal and are essential for interpersonal collaboration and functioning in society, should be integrated as part of digital skills training.

## DEVELOPING DIGITAL SKILLS AS PART OF FORMAL EDUCATION

The formal education system is the normal delivery system for digital skills. Ideally, foundational digital skills can be provided at the primary level, as part of the core curriculum; intermediate skills at the secondary/post-secondary level; and more advanced general digital skills at the tertiary level. Competences for the ICT professions are normally developed in university programs for computer science and electrical engineering, as well as in technical-vocational education and training (TVET) institutions and technology programs in short-cycle tertiary institutions. During the past two decades, as ICT was initially introduced in education, the emphasis has been on the equipment and infrastructure, rather than on the skill to be developed among students, and competences for teachers to understand and use the technology, and indeed, to feel empowered by it.

International research has shown that innovative learning with ICT predominantly depends on the applied methods in teaching rather than on technology by itself (Mayer, R. 2010). Furthermore, specific conditions need to be created to enable the use of digital technologies in education institutions. These include infrastructure, electricity, and broadband connectivity to the institution as well as adequate connectivity within the institution. A recent World Bank study documents implementation challenges in education technology initiatives in Africa (Bashir et al. 2018).

An important decision is whether to provide “stand alone” basic digital skills training to students or to integrate the use of technology across the curriculum. The latter takes time as teachers need to gain confidence and be continuously supported. Given the need to rapidly develop at least foundational digital skills in secondary students, especially in low-income countries, some “short-cuts” may have to be taken. As an overall approach, this can only remain a short-term measure. Integrating digital skills across the curriculum so that students can apply these skills in a variety of contexts and gain mastery over them requires major investments in continuous teacher training. This is especially so in the case of intermediate digital skills, which require understanding and ability to apply knowledge across various domains. Irrespective of whether “stand alone” training is provided to students, or whether digital skills are integrated across the curriculum, a dedicated implementation mechanism to provide continuous support on technical matters and involve teachers is essential for a long period of time, until the schools or lower levels of administration themselves develop these capacities.

Innovative use of ICT is interrelated at a macro, a meso, and a micro level. In a review of the field, Khalid and Buus (2017) show a common understanding for defining these educational technology application levels: that is, the micro level involves the classroom settings, the meso level encompasses the institutional level, and the macro level includes the national bodies associated with education and ICT. The complexity of coordinating among different levels and with multiple stakeholders is a challenge where Ministries of Education may have weak capacity (Buus and Georgesen 2018). This requires a long-term strategy, high-level political ownership, and great attention to implementation and support for teachers in the classroom. Box 4 shows how one state in India, Kerala, began a systematic implementation of ICT in education, starting with a few high schools and gradually rolling it out through the school system, and involving the teachers at each stage; in strong collaboration with Ministries of ICTs or Digital Economy.

Recent experiences also show that teaching children and students about safety, security, privacy, cyberbullying, and ethics is as essential as the development of technical skills. UNESCO’s DGLF framework encompasses many of these competences which should be an integral part of all basic and intermediate digital skills training.

**BOX 4****A long-term Strategy for Using ICT in School Education: The Experience of Kerala, India**

The Indian state of Kerala, with a population of 34 million, initiated its IT@School program in 2001. The program focused on secondary education, with the aim of training teachers in Information Technology, providing teachers with content closely linked to the curriculum and providing schools with infrastructure. In 2017, the state government converted the program into a special purpose vehicle, the Kerala Infrastructure and Technology for Education (KITE) to implement technology in schools. The “Hi-Tech School project” launched in 2017, followed by “Hi-Tech Lab” project in 2018, was envisaged as a means of using technology to turn public schools (grades 1-12) into centres of excellence. The program owes its success to various design and implementation characteristics, while building on the state’s starting endowments, which include near universal literacy and participation in secondary schooling. Ownership of the project was strong, with successive governments from different political parties continuing the support over a period of almost two decades up to now.

**Key Successes**

- The program was first implemented in 45,000 classrooms in 4,572 high and higher secondary schools, and subsequently extended to 11,274 primary and upper primary schools. More than 4.5 million students are covered, and more than 200,000 teachers have been trained through continuous sessions.
- It combines interventions at the student, teacher, classroom, school, and management level.
- A resource portal for teachers and students, *Samagra*, provides access to a variety of multi-media materials, linked to the curriculum and syllabus. Many digital materials have been co-developed by teachers, adhering to pedagogical guidelines. Cyber safety is an integral part of the teaching.
- Teachers have been trained on use of the materials and equipment on a regular basis. The first official massive open online courses (MOOC) course for schoolteachers allowed them to undergo mandatory certification courses without losing instructional hours.
- Students in schools have formed IT school clubs (Little Kites) and engage in exploration and self-learning, forming the largest ICT network of students in the country. Topics covered include animation, electronics, robotics, AI, local language computing, and cyber safety.
- Students and teachers post videos on the TV channel run by KITE for schools (*VICTERS*), which is available on all cable and DRH networks and social media platforms.
- The program features a suite of e-governance applications, such as school management system, a training management system, textbook supply monitoring system, and management of the state school system’s science fairs, sports competitions, and arts festivals. It also provides technical support to schools for procuring and maintaining equipment and resources.

**ADVANCED DIGITAL SKILLS FOR ICT PROFESSIONS**

One recent study estimates that, by 2030, there will be 230 million jobs requiring digital skills in sub-Saharan Africa alone.<sup>43</sup> This demand is driven by agriculture, industry, and especially services, as digital technologies dramatically change customer behaviours and deliveries. This study also identified that while basic digital skills will be required in all occupations, advanced skills, such as database management, data analytics, and AI/machine learning are also considered requirements in key sectors. The share of employees needing these skills will increase as firms start using data to guide their decisions regarding production, marketing, maintenance, after-sales service, and so on. Such advanced digital skills require university-level training, in computer science, engineering, mathematics, and related fields. Digital skills at the

43 The examination assesses how well CS seniors master CS-related concepts, principles, and knowledge. International Finance Corporation, *Digital Skills in Africa*. 2019.

technician level will also become important to set up and service the huge amount of digital infrastructure, mobile networks, devices (computers, servers, drones, sensors) and manage cybersecurity.

In this period of rapid knowledge generation and technological innovation, fundamental reforms are required in the curricula and teaching methods of computer science and engineering programs in most countries. The quality of these programs undergirds the ability of a country to use and adopt digital technologies. Teaching students, a firm grasp of the fundamentals of the discipline, developing problem-solving skills and an ability to communicate and work in interdisciplinary teams, as well as equipping them with the tools for lifelong learning to keep up new knowledge, are the essentials of a modern engineering or computer science program. New pedagogical approaches such as “project-based learning” encourage independent and innovative solutions-oriented thinking that can enable students to keep up with and drive changes in technologies used at their workplace.

Universities need to put in place mechanisms for assessing the quality of teaching, student learning, and program outcomes, and regularly update curricula. There are vast differences in the quality of these programs, which are underscored by a recent study which assesses the learning outcomes of computer science students in the USA, China, India, and Russia, which covered content areas such as discrete structures, programming, database management, developing complex software applications and algorithms, computing systems, software engineering, and information management and found that U.S. students far outperformed students in the other countries (Loyalka et al. 2019).

The shortage of digital talent, especially at the advanced level, is driving governments and the corporate sector to invest in training programs to upgrade the skills of their own workers and to provide training for graduates, in order to build a pipeline of future workers. To accomplish this, companies and governments are leveraging digitization to design and provide digital skills programs for rapid skilling via online courses or bootcamps. Open educational resources (OERs) and MOOCs, while currently underutilized, still offer opportunities to learn for many workers and citizens. For youth who have dropped out of education and lack the necessary skills, well-designed digital skills programs offer a second chance to acquire relevant skills for integration and re-integration into the industry (OECD 2015). Overall, targeted programs for those active in the labour market can effectively equip jobseekers with more adequate digital skills as well as the latest digital skills. A number of technology and technology consulting companies, such as Accenture, Microsoft, CISCO, HP, Samsung, Apple, and Google offer certificates that MOOC participants can earn directly online. Similarly, Digital Skills Global offer digital skills programs for professionals, in partnership with leading universities and corporate organizations to rapidly produce digital leaders.

## RE-SKILLING OF THE EXISTING WORKFORCE IN THE PRIVATE SECTOR

Digitalization has the potential to help firms increase their competitiveness but a major issue for the private sector is the upskilling of the existing workforce in basic and intermediate-level digital skills. The COVID-19 crisis has changed the future of work and accelerated the need and uptake of digitally enabled remote work and new digitally enabled delivery models. Digital technologies

can enable remote work and support the workforce in adjusting to the remote work situation.

A recent article in Wharton (2019) on *“How Closing the Digital Literacy Gap Helps Workers — and Employers”*, stresses that closing existing skills gaps in many companies could bring new opportunities and rewards. Typical challenges faced by employers are: how much of the existing workforce should be re-trained? In what specific competences? And what should the modalities be for upskilling?

Descriptive, diagnostic, predictive, and prescriptive analytics require different levels of digital skills. Broad-based data literacy, enabling employees to collect and use relevant data, can fuel productivity in many ways. Another competency concerns digital marketing, including knowledge of mobile experience and design of multiplatform user experience. These are among the top industry skills that are in short supply.

### BOX 5

#### COVID-19 and the Future of Work (Baker, 2020)

- **Remote work increases** — Forty-eight percent of employees will work remotely after the pandemic, compared to 30% pre-pandemic.
- **Expanded data collection** — This is a long-term trend that will be accelerated by new monitoring of remote workers and the collection of employee health and safety data.
- **Employer as social safety net** — The pandemic has increased the trend of employers playing a greater role in employee and community support, including both financial and mental well-being.
- **Contingent worker expansion** — Employers will expand their gig worker population to enable more flexibility of workforce management, both for cost savings and to address temporary absences due to illness or caregiving.
- **Separation of critical roles and critical skills** — Organizations will increase the prioritization of critical roles that are linchpins of critical workflows, regardless of the skills required for the role, not just the critical roles that have critical skills.
- **Humanization and dehumanization of workers** — In some cases, organizations have recognized the humanitarian crisis of the pandemic by prioritizing the well-being of employees as people over employees as workers. In other cases, organizations have also pushed employees to work in conditions that are high-risk with little support, emphasizing their role as workers over their well-being as people.
- **Emergence of new top-tier employers** — As the labour market starts to return to normalcy, the most common question that candidates will have is, “How did you treat your workforce during the period of the virus?”
- **Shift from designing for efficiency to designing for resilience** — Employers have been focusing on streamlining roles, supply chains and workflows. This has created efficient but fragile systems. Organizations will start to design for resilience as much as they do for efficiency.
- **Increase in organizational complexity** — Over the next several months, organizational complexity will rise due to an acceleration of mergers and acquisitions (M&As), nationalization of companies and bigger companies becoming even bigger.

**BOX 6****Developing a Digital Workforce, Gartner group**

Identify six to eight competencies that will be critical to your organization's success in digital ecosystems.

Keep business acumen, digital dexterity and growth mindset on your list of competencies and use them as the starting focal point of digital competency development efforts.

Scale the competencies by proficiency levels and provide representative behaviour examples that will direct change in behaviours and practices to improve workforce performance.

Take the lead in implementing these competencies within the IT organization.

Build learning maps to close competency gaps with a blend of training and on-the-job development activities to reinforce behavioural change through practices.\*

\* Gartner, September 2020: *Develop the Competencies Your Workforce Needs for the Digital Ecosystem*

**BOX 7****World Bank: Map/Catalogue of Digital Capabilities, in partnership with OnLine Campus (OLC)**

The World Bank is developing a map/catalogue of digital skills programs and courses developed by universities and private and public providers and offered through various learning platforms. It includes mostly computer science courses that may teach diverse audiences' digital skills at various levels. The search allows users to find courses by category (foundational, intermediate, etc.), target audience, level, language, and certification. The majority of courses are open source, i.e., tuition-free (some may include a fee for certification). To take a course one needs internet access at home or at a hot spot, and a device: a computer, laptop, or mobile phone.

The Map is designed to ensure inclusivity in acquiring digital skills by all populations regardless of the level of computer literacy: children, women, and girls, vulnerable groups (refugees and people with disabilities), aging population, and youth seeking job opportunities. It is recommended both for individuals willing to develop digital skills and acquire agility in navigating the internet, and organizations interested in reskilling their workforce.

For companies and employees, the biggest cost is often the cost of employee time devoted to training, and small companies may not be able to invest heavily in upskilling. Further, the benefits of this training could be lost to the firm if the employees join another firm. The success of the training depends on the motivation of the employees and incentives or perceived benefits derived from the training, as well as the format of the training. These well-known failures in the training market exist in digital training and are accentuated by the fact that digital technologies are constantly changing, requiring repeated investments in training.

Gartner offers concrete suggestions for leaders that wish to develop the digital skills of their workforce.

Also, to assist in upskilling the labour force WBG has developed a Map of Digital Capabilities, that can act as a source of inspiration for leaders looking to leverage publicly available learning platforms to upskill themselves, their staff or the citizens of their nation, region or city (see Box7).

The importance of digital skills is reflected in the wage returns in a variety of industry skills requirements (Falck et al. 2016). Workers performing at Level 2 or 3 (medium-to-highly skilled) are averagely paid 27 percent more, compared to workers who can only perform the most basic (those at level 1 or below) computer functions, such as operating a mouse or sending an email. These gaps are higher than 50 percent in England (UK), Singapore, and the USA. Workers with no computer experience earn around 10 percent less than those with the most basic computer skills. Some jobs that require more intensive use of ICTs also require specific technical, professional,

**FIGURE 3**  
How TESDA Helps the Filipino Worker, in a Nutshell.



SOURCE: Dela Rama, M.S. 2018. Optimizing eCenter resources with TOP: Optimizing TOP with eCenters. Technical Education and Skills Development Authority (TESDA).

and other occupational skills. In addition to these, a sound level of proficiency in information-processing skills such as literacy and numeracy, collaboration techniques, autonomous work, interpersonal skills, and problem-solving skills are largely required (OECD 2015).

These features of digital training programs are leading to innovations in how training is delivered and financed. For example, various governments are incentivizing firms and individuals to invest in their own upskilling. Programs of these sort are promoted through the likes of Festo Didactic SE and BBIT, in which digital skills are connected and enhanced to workplaces and on-the-job

learning with support from government, typically through tax incentives. To broaden access to quality TVET programs, the Technical Education and Skills Development Authority in the Philippines launched an online learning platform as a free, open, educational resource for TVET skills development. Learners of the TESDA Online Program (TOP) achieved a pass rate of 92 percent upon completion of the online courses. Nearly all users claimed that the TOP program helped improve their skills and employability (Figure 3).

Other government sponsored upskilling initiatives include Singapore's SkillsFuture for Digital Workplace. Launched in 2017, the primary objective of the program was to ensure that people acquire the right mindset and basic skills to work in a digitally enabled environment. The program makes

### BOX 3

#### Mobile Training Platforms

One of the pioneers in mobile-first training platforms, Gnowbe, bases itself on the findings in cognitive science and focuses on how adults learn. Adult attention spans are short, which means that content should be bite-sized and easily digestible. Videos are therefore three minutes or shorter. To enable more experiential learning, which is preferred by adults, the learning platform incorporates many interactive features. Curated content is available in the platform from leading companies and institutions.

An interesting aspect of the Gnowbe training approach is that it incorporates non-cognitive skills such as collaboration, which is one of the main attributes of workers in the 21st century workplace. The training modules target core areas for improvement, such as knowledge sharing and changing behaviours. With applications used in more than 20 countries, the platform has increased use for those seeking to upskill and reskill within companies.

SOURCE: Gnowbe. Gnowbe for Business. <https://www.gnowbe.com/platform/>

participants aware of mainstream technologies (such as mobile apps), cybersecurity, how to use data and information, and most critically, makes them aware of the major technological forces that are changing the nature of work and the workplace, as well as the citizen-government relationship. A unique feature of the program is that it helps participants to continue engaging in learning by developing an action plan and accessing modules through a training delivery partner.<sup>44</sup>

A private sector approach to online training can be exemplified by Gnowbe (see Box 8), one of several training platforms that leverages the ubiquity of smartphones to deliver training.

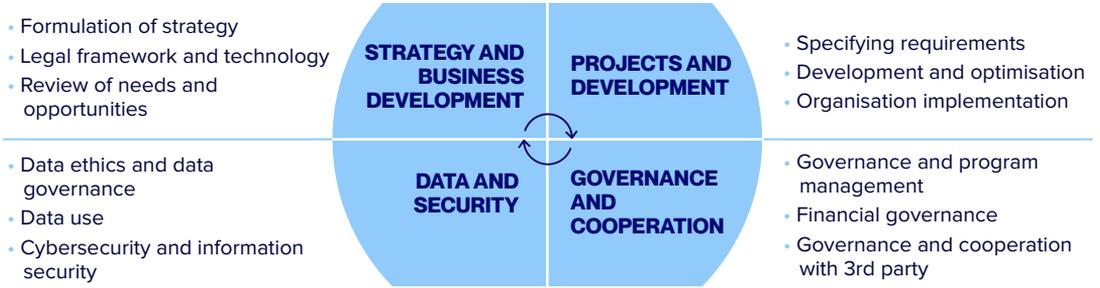
According to Wharton (2019), it was indicated that closing existing skills gaps in many companies could bring about new opportunities and rewards. Cybersecurity, big data, and analytics, for instance, are top industry skills that are in short supply, but the use of which by the workforce is critical to question a problem, collect relevant data, and use the relevant skills to analyse datasets. The value, however, not only accrues from upskilling the private sector labour force. Upskilling other segments of the population could also bring about value to society, including the civil service and civil society.

## DIGITAL SKILLING OF CIVIL SERVANTS AND SERVICE PROVIDERS

Central to the whole-of-nation approach is the idea that civil servants and service providers will adopt a citizen-centric approach. For this, they need to develop at least a certain level of digital literacy and technical and leadership skills. All government employees should acquire at least intermediate-level digital skills focused on data literacy, ability to retrieve and share information, communication, collaboration, and creation of simple content. As experience has shown, massive one-off training has little impact. Repeated, life-long training, related to the jobs done by the employees, is required, some of which is mandatory, and some of which should be incentivized. The World Bank's continuous training of its staff on cybersecurity, through its Online Campus programs, is an example of such repeated capacity building.

Countries that reflect a higher level of maturity in their digital transformation agenda have undertaken more institutional approaches, especially to develop digital leadership at different levels. Digital Israel has established a year-long Digital Leaders Initiative designed to build digital skills among both digital natives and digital immigrants. It brings together a mixed group of senior and mid-level leaders in both central and local government to build core skills and

**FIGURE 4**  
**The Danish Government Digital Academy: Digital model**



apply them to cases – and teaches them to put the user needs at the centre of all initiatives. Supplementing this initiative is Campus-IL, an online platform with more than 220.000 members and 230+ online courses (Apolitical, 2019).

The Government of Denmark established the Digital Academy to provide uniform training for government employees at all levels, to increase maturity and quality of digitalized government services and internal processes. This is done through The Danish Government Digital Academy (cf. Figure 4).

By upskilling both the public and private sector labour force the supply side of a digital transformation can be addressed, but that leaves the demand side, which requires the upskilling of the remaining population.

**CIVIL SOCIETY AND THE VULNERABLE POPULATION**

The digital divide<sup>45</sup> is important as it reflects the differences in the ability of individuals and businesses to take advantage of the internet and leverage the vast source of knowledge it offers, especially women.

Rapid growth in the use of the internet in developing countries over the past decade has somewhat narrowed the gap with industrialized countries. In developing countries, the percentage of the population using the internet grew from 7.7 per cent in 2005 to 45.3 per cent at the end of 2018; in industrialized countries, the share grew from 51.3 percent to 80.9 percent over the same period (ITU, 2020). However, the increased connectivity has had limited effect in reducing information inequality and lack of digital inclusivity. For example, the percentage of people using the internet in Africa increased from 2.1 per cent in

45 The digital divide is defined by the OECD (2016) as “the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard both to their opportunities to access information and communication technologies (ICTs) and to their use of the internet for a wide variety of activities.”

2005 to 24.4 per cent in 2018. However, eighty-five percent of the user-generated content indexed by Google comes from the USA, Canada, and Europe (ITU, 2020), excluding millions of non-English speakers in the global digital society. And, taking into account that about one-fifth of the world's population is illiterate, the spread of digital technologies alone will not close the digital divide.

Countries that have bridged the digital-access divide, face a new divide – in how digital technologies are used. The use of e-government by citizens is highly uneven among different demographic groups – it is positively correlated with higher levels of education, type of employment, urban residence, being male, and broadband access. There is limited information available for developing countries. For example, Africa experiences serious gaps in inclusivity: women are less likely than men to use digital government services. Gaps are even larger between youth (20 percent) and those more than 45 years old (8 percent) (WBG World Development Report, 2016).

Advanced countries are increasingly offering broad digital skills training to the entire population, seeing this as a public good, akin to literacy and numeracy. A case in point is Finland's AI course for the population. The citizens of Finland have access to a free online course on AI. This is offered through two course components and has so far gained 430,000 registered learners from 170 countries, with at least 40 percent women registered on the course (Elements of AI, 2020).

Developing countries, with limited resources, have tried to focus on the younger age groups in the workforce, though even here coverage has been limited. Youth unemployment is an ongoing challenge in Northern Nigeria. A case example of training youth and vulnerable women in partnership with a local non-profit organization is exemplified in Kaduna State, where a digital skills pilot program was implemented to improve the digital skills of youth and vulnerable women between the ages of 18 and 40. The aim is to ensure youth and women take advantage of employment opportunities in the digital economy (ibid).

In developing countries, governments must address the challenges that have emerged in the course of implementing such programs if they are to scale up. These challenges include:

- » Limited internet infrastructure, which therefore prevents access to available digital skills learning platforms. Low network bandwidth or even power supply often contribute to inadequate and/or unavailable internet connectivity.
- » Lack of relevant devices and digital tools available for digital skills programs, including computer tools and packages, up-to-date operating systems, etc.

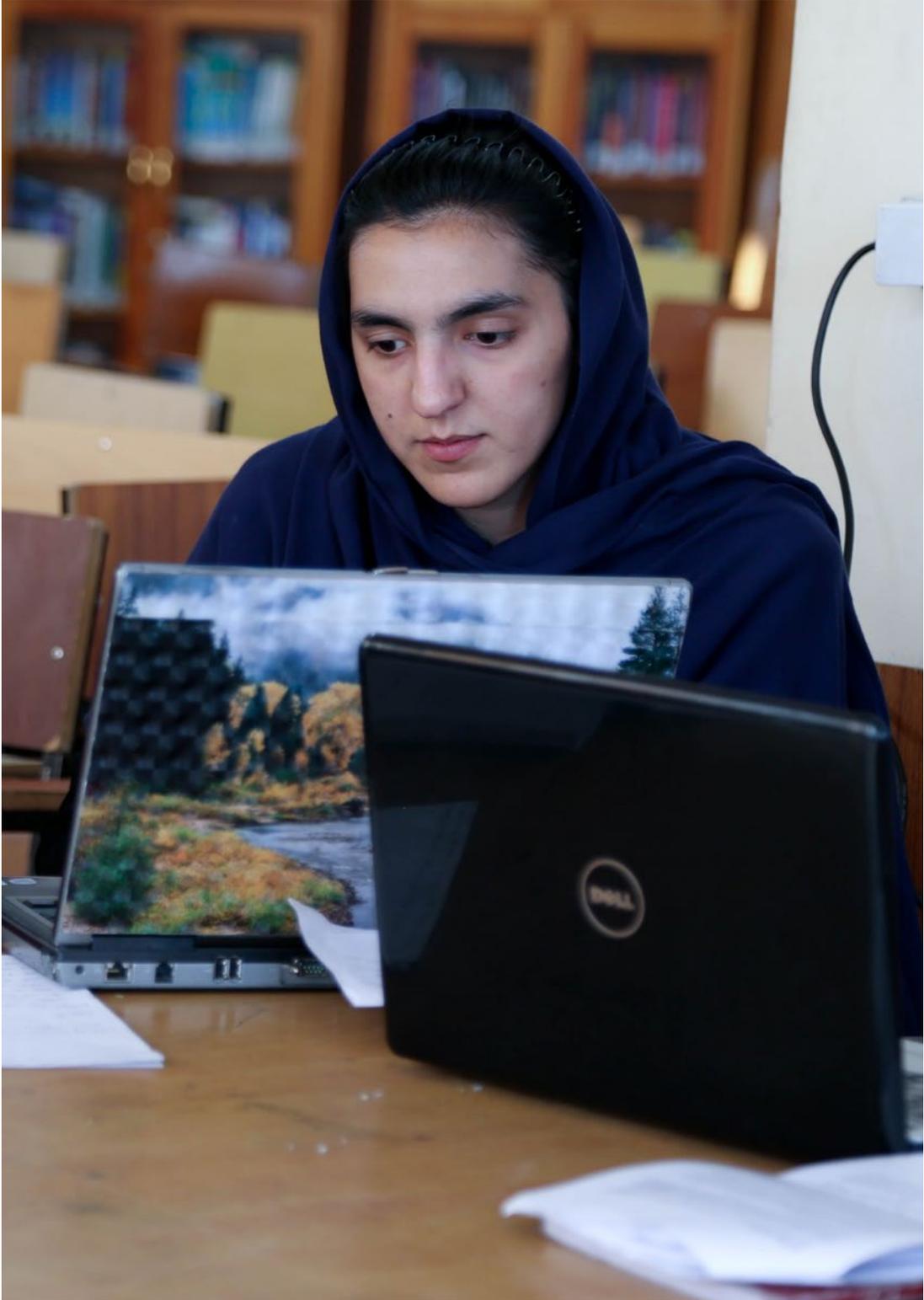
**BOX 9****Case Study on Kaduna State Digital Skills Program**

The Kaduna State Government launched the ‘Click-On Kaduna’ program in partnership with the World Bank Group and the Rockefeller Foundation. ‘Click-On Kaduna’ aims to empower disadvantaged youth and women between the ages of 18 and 40 in fragile and conflict zones, by training them to leverage employment opportunities in the digital economy, because many young people in Kaduna State have limited access to gainful employment opportunities in the local market. The program uses digital technologies to drive innovation, digital skills, and job creation, and break the cycle of unemployment, and fragility, violence, and conflict in Kaduna State, especially for young people. The ICT sector offers new opportunities for youth in Nigeria as they enter the virtual economy and earn an income by performing paid tasks in a growing global marketplace.

- » A limited local technology ecosystem to prepare/adapt and deliver training content.
- » Inability to incorporate local language and knowledge into programs.
- » Socio-cultural and religious norms that restrict certain population segments (e.g., women) from accessing digital skills programs.

A serious impediment to bridging the digital divide is the lack of information that throws light on inequalities. Data collected and disseminated by telecom operators typically do not collect such information and provide a misleading picture of increasing access. One good approach is to regularly publish data on the geospatial coverage and usage, which provides information on gaps within a country.





# 4

## **Digital Culture— Building an Inclusive Digital Culture and Society**

This chapter discusses the importance of cultivating a digital culture to sustain the digital transformation efforts of any given country. A digital culture is discussed in terms of the beliefs, values, and behaviour of people. The attributes of a digital culture are described, and emphasis is made on ensuring inclusivity for all in society, as the country advances in its trajectory towards digital transformation.

Considering the changes brought about by the COVID-19 pandemic, the importance of a strong digital culture in sustaining the digital transformation during uncertain times cannot be understated. Governments, as digital leaders, can intentionally cultivate the attributes of digital culture through leading a range of digital initiatives and pro-digital innovation regulatory frameworks and policies, as well as championing a digital first mindset in all engagement with their citizens.

## CULTURE IS KEY

A culture can be described as the normative values and behaviour of a people group. It codifies and expresses, often in unspoken and tacit terms, what is acceptable and what is transgressive in a social group. The culture is a reflection of what matters to the society. This culture is expressed in the ways of thinking and doing among a group of people. Scholars have shown how citizens in societies are enculturated and socialized into the acceptable ways of the culture through observations, learning, and practising the normative thinking, artefacts, and behaviour (Vygotsky, 1978). They then continually reproduce and reinforce the culture of the society (Bourdieu 1986; Navarro 2006).

Cultural change is therefore not easy. It requires a certain level of intentionality and resistance to default towards the norms. Digital leaders are aware of this and through careful designs, signalling, incentivizing, communication, institutional, and structural modifications, as well as new programs and initiatives, they endeavour to shift the people's beliefs and actions towards the desired cultural values and practices for digital transformation.

A national culture can be described in the dimensions of how inequalities among its people are handled, the values for competition or cooperation, collective response to uncertainty and ambiguity, maintenance of links with the past and preparation for the future, and indulgent or restraint social norms (Hofstede, Hofstede, and Minkov 1991/2010). Geert Hofstede defines a national culture as “the collective programming of the mind distinguishing the members of one group or category of people from others” (Hofstede Insights, 2020).

In a report commissioned by the Singapore Management University through Trompenaars Hampden-Turner Consulting (2018), legacy culture and mindsets

were identified as the biggest barrier to digital transformation. There was a need for digital leaders, managers, and the people to decisively “dismantle legacy processes and platforms, unlearn and recreate”.<sup>46</sup> The academic study concludes that culture determines digital transformation success and argues that it is culture that determines transformation, rather than technology. As such, there is an urgent need for digital leaders to review and rethink the legacy, that is the existing, cultural values and practices present in society and determine the desired digital culture they seek to cultivate.

The defining factor in the sustaining and scaling up of digital transformation efforts across a nation is thus culture. The tenets discussed in this report underscore the need for a digital ecosystem that comprises strong and inspiring digital leadership, clear structure and plans for nurturing of digital skills, and accessibility to quality digital content and services. The constitution of this digital ecosystem, however, is cultural. Culture is about citizens’ values, beliefs, and behaviours, as well as the extent in which the last and the least are taken care of through systemic inclusivity schemes (Hofstede, Hofstede, and Minkov, 1991/2010).

Culture has been widely regarded as the key to digital transformation efforts by various international studies and consultancies. For example, the Boston Consulting Group (2020) compared digital champions and digital laggards among some 1,900 companies in the USA and Europe. It reported that the impact of culture was of high significance and a greater influence than investment in digital initiatives and recruitment of digital talent. A positive digital culture, as described by the Boston Consulting Group, is one that encourages an outward-looking orientation and collaboration between people. It is also action-oriented, prizes empowerment, and rewards risk-taking.

Similarly, a global study conducted by McKinsey & Company (2017) highlighted that insufficient attention paid to the cultivation of a digital culture is the most significant barrier to digital transformation efforts. Cultural and behavioural challenges are deemed more debilitating than weaknesses in other aspects of digital ecosystems such as funding, structures, processes, infrastructure, content and services, and leadership support. While these studies have focused on digital culture in business corporations, this chapter builds on the understanding and extends to the domain of a digital culture for a country and the actions governments can perform to cultivate a digital culture for its citizens. Deborah Ancona, MIT Sloan School professor, states that “leadership often underestimates the importance of culture”.<sup>47</sup> However, without sufficient attention

---

46 Trompenaars Hampden-Turner Consulting, 2018, p.37

47 Capgemini Consulting (2015).

paid to cultivating a digital culture, it is impossible to progress, sustain, and scale up digital transformation efforts.

In this light, it is fitting that our study concludes with a chapter on digital culture. As the invisible constituent of the digital ecosystem, cultural issues, such as beliefs and values, can often remain tacit and neglected in digital transformation efforts. In the sections below, we define digital culture and discuss how it can be intentionally cultivated. Case studies of countries that have embodied the importance of the role digital culture plays in its expression of the digital capability framework are also offered for inspiration.

## Defining a Digital Culture

The attributes of a digital culture in organizations have been studied and reported in the work of many scholars, including researchers from MIT (Capgemini Consulting, 2015), on which we base our conceptualizations. Attributes of digital culture that have been identified in their report include innovation, data-driven decision making, collaboration, openness, data first mindset, agility and flexibility, and customer-centricity. We appropriate and re-define these terms in relation to the attributes of the desired digital culture of a country. In relation to such a culture at the societal level, we also add inclusivity to the attributes, which ensures that the weak and vulnerable are neither left out nor left behind as the country advances in its digital transformation efforts.

As such, we describe the attributes of a digital culture in terms of attention being paid towards cultivating the beliefs and behaviours of citizens in the following areas:

- 1. Digital First Mindset:** a mindset where digital solutions are the default way forward.
- 2. Citizen-Centricity:** the use of digital technology to design solutions for citizens' experiences that are seamless and integrated.
- 3. Data-driven Decision Making:** the use of data and analytics to make better life decisions.
- 4. Digital Innovation & Experimentation:** the prevalence of behaviours that support risk-taking, disruptive thinking, and the exploration of new ideas.
- 5. Collaboration & Citizenry Co-Creation:** the promotion of active citizen engagement and contribution to digital initiatives.

- 6. Openness & Accountability:** the collection and use of data in accordance with privacy regulations and ethical guidelines to engender trust through communication.
- 7. Agility & Flexibility:** the speed and dynamism of decision making and the ability to adapt to changing demands and technologies.
- 8. Digital Inclusivity:** Ensuring that the weak and vulnerable can participate fully in digital transformation initiatives.

The digital leaders are responsible for intentionally cultivating the desired attributes of the digital culture. This can be achieved through personal leadership, such as role-modelling and espousing across media platforms the values of the desired norms. For instance, leaders could highlight the benefits of cash-less payment in terms of the ease and efficiency it brings to promote a digital mindset where technological solutions are embraced.

Leaders could also design systemic and organizational structures through programs and activities to encourage desired behaviours. For example, government agencies could organize hackathons where organizational data are made available for the community to develop solutions to digital challenges. Such activities harness the wisdom of the crowd by promoting greater ground-up contributions and citizens' involvement. They also cultivate the collaboration and citizenry co-creation attribute of a digital culture.

Further to this, leaders could also apply principles of behavioural sciences to motivate desired behaviours through defaults and nudges, as well as providing incentives to reward and motivate those behaviours (Thaler and Sunstein, 2008). For instance, leaders could design defaults that require companies to inform citizens on the nature of data collected and the use of data in accessible, jargon-free, and non-legal terms. This will contribute to the attribute of openness and accountability in the digital culture and engender greater trust and reception among citizens.

## DIGITAL FIRST MINDSET

The COVID-19 pandemic has accentuated the value of digitalization of services and the responses to ensuring business continuity in this time has accelerated countries' digital transformation efforts. Through the experiences of working from home, remote learning, and digitally mediated socializing during the lockdowns in countries, people have embraced the value of technology and have developed new digital practices that are likely to continue in the new normal, post-pandemic. A positive outcome of the pandemic is its contribution to cultivating a digital culture and fostering a digital first mindset in people.

A digital first mindset is not about the ability to use technology. Instead, it is about the beliefs, attitudes, and pre-disposition towards digital solutions as the way forward in addressing various societal or organizational challenges. It requires a strong and sensible understanding of the affordances of technology and the limitations it brings. In the design of solutions to complex and wicked problems confronting the nation, a digital mindset seeks out opportunities to harness technology productively.

An advantage of a digital mindset among the populace is to bring about greater productivity and efficiency through seamless connectivity. This can be achieved through greater interactivity across digital systems and through a culture of data sharing. For example, citizen-centric services could be experienced in an integrated manner where government ministries and agencies share citizens' data across organizations, while respecting data privacy. This reduces the need for paperwork and repetitive form-filling when applying for government schemes and services. Countries such as Estonia have stimulated a collective digital mindset by pushing for “paperless” transactions, and digitalization of business processes.

A digital first mindset can encourage citizens towards a greater acceptance of technological solutions and lower the resistance against the changes wrought by disruptive technologies. The digital transformation will inevitably bring about a change in job functions and even a loss of jobs (Susskind and Susskind, 2015). These disruptions place a demand on the development of digital skills and a positive attitude towards lifelong learning. Encouraging a digital mindset among citizens is thus a foundational attribute of the digital culture in society that must be intentionally cultivated.

## CITIZEN-CENTRICITY

A central thrust in the digital culture is citizen-centricity. This attribute of the digital culture defines the relationship that the government has with its people. Rather than a one-way process, where the government engages in projects to create services they believe are needed, citizen-centricity is about a two-way collaborative relationship between the government and citizens (Sense Corp, 2020). The shift towards a citizen-centric digital government involves a focus on improving the experience of citizens such as delivering more transparent, and more responsive, services across channels and digital platforms (Sense Corp, 2020).

Government agencies need continuous engagement with citizens – whether through ethnographic research, inclusive surveys, focus groups, co-creation of digital

**BOX 10****Recommendations for a Digital Era****Digital democracy and the digital citizen**

- Co-design and co-create with citizens by opening legislative processes to constituents and enabling constituents to vote or engage digitally with their political representatives.
- Enhance the share of participatory budgeting at local and regional levels, allowing people and communities to decide their own priorities.
- Shift all interactions (beyond transactions) to self-service in a citizen-centric approach that encourages communication and access.

**A new digital “operating model”**

- Develop a national digital strategy that is based on design principles like “digital by default.”
- Accelerate use of pervasive technologies like social media, mobility, big data, and cloud to leverage their full potential and embed user-centricity in any future service design.
- Create a simplified and personalized service design emulating high-quality private and entertainment services.
- Reinvent a leaner and more agile centre of government for on-line services, with quality of user experience, simplicity, ubiquity and affordability as key design principles
- Encourage innovation, transparency, ethics, security and safety online for all; while discouraging misinformation, cyber bullying, fake news and other negative usages of social media
- Upgrade the justice ecosystem to comply, and enforce, the adequate international conventions to combat cybercrime, while ensuring all society members take one quality cybersecurity training.

SOURCE: [How Europe can lead public sector transformation](#)

of other engagement methods, some powered by social media. Whatever method is chosen, the quantitative and qualitative data needs to make its way back up the chain and be linked to the citizen journeys and distributed to all relevant stakeholders in an actionable way; and government staff need to be empowered to act on this feedback. Deloitte suggests implementing a “find-fix-repeat” cycle of iterative loops that leverages real-time data to drive continuous improvement.<sup>48</sup>

In a report on Driving Citizen Centricity (Ernst & Young, 2017), EY consulting highlights the best practice across the world on how governments can deliver better citizens’ experiences sustainably. This includes the government putting in place national-level citizen-centric vision and citizen experiences with clear performance indicators, setting up incentives to encourage public servants to embody and drive the delivery of better citizen experiences, as well as to encourage the participation of citizens. The incentives include a blend of both rewards and recognition, through the use of financial levers. The EU makes similar suggestions in its Recommendations for a Digital Era (cf. Box 10).

The research notes that by focusing services on the needs of people (or users), government leaders, can make a triple value impact—improving citizens’ lives, improving the business environment, and increasing efficiency and enhancing the effectiveness of government while ensuring ownership of the design process. Thus, people-centric digital

transformation should promote development and simultaneously enable businesses and citizens to evolve from passive information consumers to active participants in designing and co-producing solutions and services aligned with

48 Fishmann, Hosea, Datar. 2016. “Rx CX, Customer experience as a prescription for improving government performance”, Deloitte Insights.

expectations of society (OECD, 2019).<sup>49</sup> Thus, engaging people/users at the very start of designing services; through design thinking, will ensure support, collaboration, and ownership while creating a level playing field based on rights, trust, accountability, and transparency, and putting people at the centre of the service delivery and organizational change.

The design thinking approach implies understanding user needs in various life events and contact points and building an organizational response and the capabilities to meet them. It also means silo structures are replaced, and end-to-end service delivery based on life events creates new and simpler processes, new consolidated data repositories, and different KPIs.

Engagement methods that are critical to the people-centred design thinking approach:

- » **User-Driven or User-Centred Design:** User-driven design is characterized by putting the user/citizen at the centre of the development process through an explorative and agile process with numerous pivots and iterations. New ways of engaging citizens can be mediated through new social platforms enabled by disruptive technologies, such as sensing technologies (e.g., sensors, biometrics) and analytics technologies (e.g., machine learning, deep learning).<sup>50</sup>
- » **User Journeys:** User journeys systematically map the steps that users must complete to achieve a task or mission. Looking at the end-to-end service allows the provider to identify the most important steps, gaps, duplicated steps, and overlaps (see Box 10). In many countries, regions, and cities, the citizen acts as service integrators – bridging the gaps between services provided by disparate units of government. Designing the journey based on the needs of the user over time rather than the internal logic of the organization can lift user satisfaction and improve efficiency. Doing away with organizational silos, process orientation in the organization, integrating data so that they are accessible across the organization, and standardizing technologies are steps towards understanding the citizen's journey.<sup>51</sup> Numerous countries have implemented citizen-centric solutions, e.g., UK's "Digital by Default" user journey approach<sup>52</sup>, Singapore's "Moments of Life";<sup>53</sup> New Zealand's "SmartStart" and "End-of-Life";<sup>54</sup> and Denmark's "Divorce" and "Move to a New House" guides.<sup>55</sup>

---

49 OECD and ADB. Government at a Glance Southeast Asia 2019: Towards a citizen-centric civil service.

50 "The usability of digital information environments: planning, design and assessment", Anthony Chow, in Trends, Discovery, and People in the Digital Age, 2013.

51 Adapted from "Using Customer Journey Maps to Improve Customer Experience", Harvard Business Review, 2010, Adam Richardson.

52 <https://www.capgemini.com/us-en/2016/09/the-citizen-life-cycle-your-driving-force-for-radical-transformation/>

53 <https://www.tech.gov.sg/products-and-services/moments-of-life/>

54 <https://smartstart.services.govt.nz/> and <https://endoflife.services.govt.nz/welcome>

55 <https://www.borger.dk/familie-og-boern/Skilsmisses-og-familiebrud> and [https://www.borger.dk/bolig-og-flytning/flytning\\_oversigt/flytteguide](https://www.borger.dk/bolig-og-flytning/flytning_oversigt/flytteguide)

- » **Personas:** The purpose of personas is to create a reliable and realistic representation of the user segments based on qualitative and quantitative research.<sup>56</sup> Based on the analysis of the citizen journeys, personas represent a major user group, express the major needs and expectations of the users, and how they are likely to interact with the organization – and all of this information is summarized in a fictitious, but real-seeming person, who represents a certain type of citizen. The persona is used throughout the process from strategy to execution to help leaders and practitioners empathize with users, prioritize and test solution features,<sup>57</sup> and guide the implementation processes. Personas and segmentation of users are important to close the digital divide, and are used for digital skilling programs, as discussed in the skills chapter.
- » **User Feedback:** As part of the people-centred design framework, users must be engaged in evaluating the initiatives. User feedback can be gathered both directly and indirectly. Direct user feedback will include three different types: general user feedback, contributory user feedback, and co-creational user feedback (Sturm and Tscholl, 2019). Direct user feedback can be combined with more indirect user feedback collected from, for example, usage data and mobile network analysis to strengthen the insights gained and the validity of the user feedback.
- » **Built-in Engagement** models such as crowdsourcing and open-source communities are good tools for collecting citizens' inputs and data. However, to use them at scale would require introducing advanced analytics and AI into the data platforms with the necessary safeguards to protect citizens, as is examined in WBG's World Development Report 21: Data for Better Lives.

---

**56** Cooper, A. 2004. *The inmates are running the asylum: [Why high-tech products drive us crazy and how to restore the sanity]* (Vol. 2).

**57** Andrea Carugati et al.; Take it Personally – The Role of Consumers' Perceived Value of Personalization on Cross-Category Use in a Smart Home Ecosystem. <https://scholarspace.manoa.hawaii.edu/bitstream/10125/63883/0115.pdf>

**BOX 11****Milan: Crowdsourcing Sustainable Mobility Insights**

An Italian start-up called [WeCity](#) is working with local governments to encourage citizens to leave their cars at home and use public transport or bicycles instead. Their mobile app allows cyclists in major cities, such as Milan and Rome, to rate roads by safety, crowdsourcing information to calculate an Urban Cyclability Index. In turn, this provides insights to local traffic authorities and planning departments to define new bus routes, build cycle lanes, or pedestrianize certain streets.

**DATA-DRIVEN DECISION MAKING**

Data-driven decision making (DDD) involves the collection and use of data to make evidence-based and informed decisions. This is regularly encouraged at the organizational level but is also applicable at the level of the citizen's personal life. Governments around the world are adopting DDD as a response to citizens' needs and concerns, as well as anticipating potential issues as part of scenario-planning and future-casting (Prasadh, Chang, and Bansal, 2020). This is evident when big data, AI, and analytics are harnessed to offer timely information. One example of DDD among citizens that has been found in countries during the COVID-19 pandemic is the use of social clustering information to provide citizens with updates on crowd sizes at various public places, such as parks and beaches. DDD empowers citizens and governments to make informed and good decisions.

**DIGITAL INNOVATION AND EXPERIMENTATION**

Placing value on innovation and experimentation, a tolerance for risk-taking, and an acceptance of failure are desired attributes for advancing towards digital transformation. In a world that is driven by changes brought about through the advancement of technology, old ways of doing things are no longer appropriate to handle the load, speed, and implications of change. Experimentation is thus critical to prototype and test digital innovations that harness the latest technology to deliver novel solutions.

A digital ecosystem is essential to support digital innovations and experimentation efforts. For example, the review of competition law could be undertaken towards the limits of intellectual property (IP) rights, especially with the objective to promote access to data. Strengthening IP rights also assures creators, who take the risks of innovating, are rewarded with the fruits of their labour fairly. Other elements include the development of technology incubators for start-ups and the provision of funding support for technology entrepreneurs through public-private partnerships (PPP) with private sector, Research Centres and Think tanks, and Academia.

At the societal level, encouraging digital innovation and experimentation among citizens may also involve the design of social safety nets to cushion the impact of failure. Such a culture can also be expressed through a celebration of diversity, non-conformity, and mavericks. A digital culture that values digital innovations and experimentations is also promoted when organizations review

existing structures to break down silos and flatten hierarchies. Such environments empower the people to push boundaries, innovate, and experiment, and with each small step, advances are made towards digital transformation.

## DIGITAL COLLABORATION AND CITIZENRY CO-CREATION

Another attribute of the digital culture is to promote digital collaboration and citizenry co-creation. This is where new services and solutions are developed not only in consultation and with feedback from citizens, but also with their active involvement and contribution of ideas and expertise in the co-creation process (Deloitte, 2019).<sup>58</sup> The importance of digital collaboration and citizenry co-creation is brought about by the government redefining its relationship with its citizens. A paradigmatic shift from seeing citizens as merely passive service beneficiaries to a view of citizens as informed and engaged partners in public service innovation and problem-solving provides the foundation for digital collaboration.

### BOX 12

#### eCitizens Ideas

Designed with the notion of enabling all Singapore government agencies to engage citizens and give them a platform for their voices to be heard, eCitizens Ideas! is a centralized platform for whole-of-nation crowdsourcing activities. Beyond giving citizens a voice, eCitizen Ideas! also empowers communities to drive the process of development that shapes their lives for the better.

Via this portal, each government agency can independently organize and manage crowdsourcing activities such as app development competitions, hackathons, and campaigns. The public can also access eCitizen Ideas! to submit, comment, and vote on the best ideas, as well as share them on their social networks.

SOURCE: [Co-Creating with Citizens in the Digital Government Era](#)

There are many strategies to encouraging co-creation between the government and its citizens. One example is the framework for engaging citizens in co-creation in public services by the IBM Centre for the Business of Government (Nambisan and Nambisan, 2013). In particular, four strategies for government leaders who wish to encourage citizen co-creation are discussed. They include (1) fit the approach to the innovation context, (2) manage citizen expectations, (3) link the internal organization with the external partners, and (4) embed citizen engagement in the broader context. Singapore's eCitizens Ideas! attempts to embody these strategies (see Box 12).

**TABLE 3****Australian Government Open Source Software Policy**

**Principle 1:** Australian government ICT procurement processes must actively and fairly consider all types of available software.

**Principle 2:** Suppliers must consider all types of available software when dealing with Australian government agencies.

**Principle 3:** Australian government agencies will actively participate in Open-Source software communities and contribute back where appropriate.

SOURCE: [A Guide to Open Source Software for Australian Government Agencies](#)

**OPENNESS AND ACCOUNTABILITY**

Openness and accountability are fundamental attributes of the digital culture that government needs to cultivate for digital transformation. Openness enables transparency and facilitates responsiveness and resilience in those transformation efforts. A transparent culture promotes innovation and creativity and encourages citizens to experiment and innovate (Gupte, 2019). A related attribute for the digital culture is accountability, which is based on mutual respect and trust between the government and its people. This is premised on effective communication which enables every citizen to develop a sense of implicit faith and goodwill towards the initiatives put in place by the digital leaders.

One of the ways openness and accountability is achieved is through open infrastructure. For example, open rules, open algorithms, and programmatic explainability are needed to ensure traceability, accountability, and appealability of decisions. For algorithmic transparency, governments need to design explainability and decision capture into systems, machines, and the use of AI. Another aspect of openness is through open data. Open data is about making available government datasets and information that do not contain personal information or pose security considerations for citizens. This could involve permissive copyright (such as Creative Commons BY), be machine-readable, time stamped, subscribable, and available in an openly documented format (open standard), have useful metadata, and wherever possible have good geospatial information available (Andrews, 2019).

**AGILITY AND FLEXIBILITY**

Agility and flexibility are signature attributes of a digital culture and have been embraced as such in an increasing number of countries around the world. An agile culture encourages risk-taking and builds both transparency and accountability (Mukerjee, 2019). In the digital age, the premium has shifted from stability to adaptability, from standardization to customization, from policy-driven to judgment-driven, from isolation to collaboration, and from incremental to exponential change (Kasoji, 2017). In this light, agility and flexibility in a digital

culture become more important than ever. An agile and flexible attitude and practice at work enables the populace not only to develop resilience but also to meet complex problems with novel and creative solutions.

A barrier to digital transformation, which was highlighted in the report by Deloitte Digital (a digital consulting agency) on *The Journey to Government's Digital Transformation* (Eggers and Bellman, 2015), is the lack of agility and flexibility. For example, the report highlighted that public sectors' procurement capabilities are constricted by rules and regulations, lack of flexibility, and a lack of procurement skillsets. Agile development and "relaxation of control from the centre" (Eggers and Bellman, 2015) will facilitate a stronger thrust towards digital transformation. An approach towards this is in the promulgation of agile methodologies, with smaller, quick release cycles and greater collaboration. This encourages flexibility as work progresses and provides space to respond to changes in the development (Discerning Digital 2020).

In public service agile research conducted by Accenture (Ng, Tambe, and Gault, 2019), it is reported that when public service organizations become agile, it enables new ways of working across policy, regulatory, and service delivery. Agile organizations are able to pivot to a citizen-centric culture that responds to citizen needs the moment they arise. They are also able to deliver dynamic regulatory and compliance frameworks, while balancing fiscal constraints to ensure efficient management and accountability of public funds (Ng, Tambe, and Gault, 2019). In this they enable the agility and flexibility ethos and practices that are instrumental in shaping the digital transformation of society.

## DIGITAL INCLUSIVITY

A shared goal espoused at the World Economic Forum's report on Our Shared Digital Future Building an Inclusive, Trustworthy and Sustainable Digital Society is to leave no person behind. The concern over the digital divide has grown ever more pressing. The report reveals multiple gaps that must be addressed by all nations. This includes income levels, age, gender, and geographical localities within the country as well as wide variations in affordability – more than 2 billion people live in a country where 1GB of mobile data is priced above the affordable threshold of 2 percent or less of average monthly income (World Economic Forum, 2018).

The digital divide, even within a nation, is a concern related to digital inclusivity. Enabling all the world's people to access and use the internet—and remove digital divides—remains a challenge that needs to be addressed if the world community is to achieve the United Nations Sustainable Development Goals (SDGs) by 2030 (International Telecommunication Union, 2019).

Ensuring that the weak and vulnerable in society can participate fully in the digital transformation efforts must be a priority for sustainable and scalable growth. Governments exist to improve the lives of the people and while digital transformation is a pressing issue for most governments, the imperative to modernize workplaces and services brings with it an opportunity to empower every citizen with technology that is designed with accessibility, utility and inclusiveness in mind (Reyes, 2019).

The groups that require special focus will vary from country to country, but as Tiffany Chow and Maria Charles show in their recent paper “An Inegalitarian Paradox” (Chow, 2019), women’s representation, in ICT programs, even in affluent societies such as the United States and European Union has actually dropped in recent years. In less affluent societies, where women play a key role in reducing poverty and promoting social and economic development, it is essential that women and girls are not left out of ICT-related initiatives. Cecilia Collado in a paper for UNESCO argues that women’s lower rate of activity on the internet is the result of a combination of lower rate of employment, greater involvement in professions that rely less on computers, as well as “lower level of computer and internet skills among female users compared to male counterparts, which makes it hard for them to obtain the maximum benefit from ICTs”. (Collado, 2014).

Collado goes on to argue that:

“Digital divisions look like technological divisions but are in fact social divisions. So, the policies for gender digital inclusion shouldn’t concentrate only on providing access, but on increasing women’s skills and abilities to allow appropriation – taking, seizing and shaping – of ICTs for their personal and professional development. This is a complex social process involving education, work and leisure, and many other domains, that cannot be left to market forces alone. Public authorities must lead the way, launching programmes and initiatives and coordinating other public and private actors, in order to overcome former and new digital gaps and to accomplish a complete inclusion of women in the [information society].” (Collado, 2014).

Consequently, gender inclusion in digital transformation projects, and accessibility for all, are critical to the success of digital transformation. The important topics and principles concerning gender inclusion are discussed in specialized WBG research; such as “Information and Communication Technologies for Women’s Socio-Economic Empowerment” and “Gender and ICT Toolkit”<sup>59</sup>, while accessibility issues are covered in more detail by the International

**BOX 13****Enabling People with Disabilities**

With the help of cloud and AI platforms, people with disabilities in Moscow are using an urban mobility app called Moovit to help navigate public transit and gain independence. The app carefully labels all content for use by mobile screen readers and simplifies condensed intricate data such as routes, trip duration, start and end times, entry and exit stops, thereby allowing the visually impaired to navigate using the Moovit solution.

Moovit, along with Microsoft, is partnering with cities the world over to help create more accessible transit solutions. Azure Maps underpins these mobility-as-a-service solutions for governments, helping produce more accessible transit apps.

SOURCE: [How Moovit improved its app to help people with disabilities ride transit with confidence](#)

Education Union and the Global Initiative for Inclusive ICT (G3ict) in their joint work on e-Accessibility.<sup>60</sup>

In a report on Inclusive Smart Cities, *Delivering Digital Solutions for All* (O'Dell et al., 2019), Deloitte highlights the shifts of moving from technology-centric to citizen-centric smart cities. In particular, it foregrounds the importance of ensuring that communities are not neglected in digital transformation efforts. For example, it describes a joint venture between Google and the Royal London Society for Blind People that is helping the visually impaired navigate the city's transportation network using beacons to provide audio instructions via a smartphone application (Heath, 2015).

Digital leaders and governments can institute policies and programs that support the weak and vulnerable in their society to participate in the digital transformation. For example, it can provide training for less digitally savvy citizens, such as the elderly, to develop basic digital skills so they are able to access the digital government services offered, as well as to perform digital financial transactions so as to participate in the digital economy (Clastornik, 2019).

The concern over digital inclusivity has been discussed across the chapters in this study. Here, it is emphasized again to highlight its importance in relation to building up the digital capabilities of the country, and to ensure all citizens are able to participate fully in the digital transformation.

## TOWARDS A CULTURE FOR DIGITAL TRANSFORMATION

A digital ecosystem is needed to support digital transformation efforts. Digital culture is the constituent of this ecosystem. The UNESCO report on *Digital Culture: The Changing Dynamics* highlights how digital culture determines the "new social ecology" (Uzelac 2008). The beliefs, values, attitudes, and behaviours of the people need to progress in tandem to sustain and scale up digital transformation across the country. Much of the cultural knowledge is codified and embedded within daily social practices and routine structures and activities experienced in everyday life. However, while culture is often reproduced and reinforced through appropriating the normative ways of thinking and doing, digital leaders can shape the culture through clear communication

and strong signalling, as well as designing programs and processes that reflect the ideologies of the new normal. Thus, government leaders need to champion the desirable attributes of the digital culture proactively through the levers of power and influence they exercise. The attributes identified in this chapter include nurturing a digital first mindset among citizens and encouraging informed choices through data-driven decision making. This will encourage a shift in the mental model of citizens towards a paradigm where digital technology is inextricably a part of their lives.

Digital leaders may be able to find allies in changing entrenched cultural norms by working with what Marc Prensky in 2001 termed “Digital Natives” (Prensky, 2001) – the generations that have grown up with digital technologies, spending more time on their smartphones, playing video games or watching TV than reading. These generations want their learning and working environment to reflect their preferences, and in spite of a tenuous link between youth and digital skills (Creighton, 2018), their preferences for using digital solutions and services are well established and may be leveraged to move towards a culture for digital transformation.

An environment that promotes digital innovation and experimentation should also be intentionally cultivated through a fail-safe culture where entrepreneurs are celebrated. A robust IP rights regulatory framework and a vibrant angel-investment landscape, along with a hub of technology incubators offers incentives for innovators and entrepreneurs to create and innovate.

A digital culture is also a participatory culture, where the relationship between the government and its people is redefined through greater engagement. Building on citizen consultation and feedback, government needs to provide platforms to invite collaboration and citizenry co-creation of solutions, including content and services.

A digital culture is marked by a privileging of transparency and responsibility. Given increasing concerns over data privacy and ethical use issues, governments need to model and promote openness and accountability through its workings across ministries and agencies. It should also set up and enforce regulatory frameworks to ensure private companies adhere to a high level of openness and accountability to build a deep sense of trust among citizens towards digitalization efforts. Ability to ensure safe use of cyberspace, mitigating cybersecurity risks, and cyber criminality is key, involving law enforcement and Justice ministries, equipped with lawyers and judges fully versed in the digital sector.

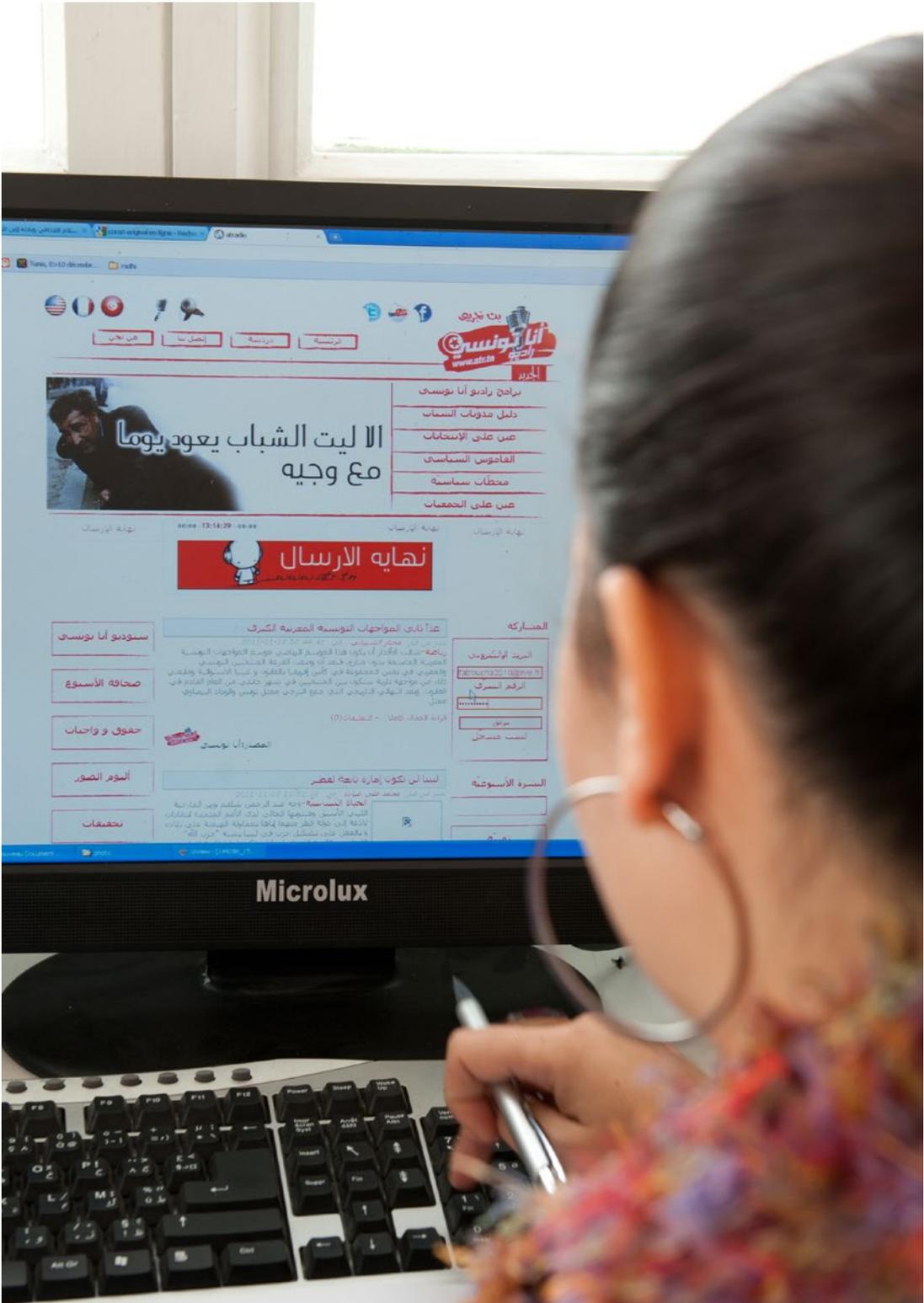
Agility and flexibility are also key attributes of the digital culture, in a world where changes due to advances in digital technology are accelerating at an unprecedented pace. People will need to adjust and continuously learn new

digital skills as changes become more frequent. Governments will do well in anticipating and responding to these issues by developing the capability of adaptive expertise.

People must remain at the heart of the digital transformation of a society. This requires government to recalibrate its measure of success beyond efficiency to experience. The focus on delivering goods and services efficiently and measuring productivity must now be seen in light of the focus on the user's experience. Citizen-centricity necessitates a breakdown of organizational silos towards an adoption of a whole-of-nation approach to better citizen experiences of digital content and services.

As society advances towards digital transformation, it is imperative that all citizens, including the weak and vulnerable, progress with it. Digital inclusivity is a core attribute of the digital culture. It requires that the government takes special care of these groups of people – the elderly, the poor, and the marginalized communities. This will ensure the digital divide is not exacerbated as the government attempts to leapfrog towards digital transformation.





# الا ليت الشباب يعود يوما مع وجيه

- برامج راديو انا تونسسي
- دليل مدونات السماء
- صن على الانتخابات
- القاموس السياسي
- محطات سياسية
- عن على التجمعات

## نهاية الإرسال

- سوديو انا تونسسي
- صحافة الأسبوع
- حقوق و واجبات
- الأمور الصور
- تحقيقات

عاد ناى المواجهات التونسية المغربية المكرر  
 سببها كان محترم كمنهاج - من 4:00م - 10:00م  
 رياضة-تلك الأقدار أن تكون هنا القوسم القرائي موقع المواجهات التونسية  
 المغربية الفاسقة بدون مزارع فقد أن وجدت الفرقة العنصرية التونسية  
 والعمري التي تدين المحكومة من كابي وروانيا والفقير و تبتا الأستوائية والذين  
 تلك من مواجعة رأية سكون من الضحايا في سنون بخاص من القوا القمام في  
 القرون بعد الهوي القاتل الذي جمع البرخي مثل تومي وروان البيضاوي  
 جعل  
 فرقة القمام الكلا - - التجمعات (3)

المشاركة

البريد الإلكتروني

الرقم الشخصي

اسم

لست متأكد

البريد الإلكتروني

Microlux

5

**Postscript:  
How the World Bank  
Group Can Help**

In this final chapter we will provide an overview of what WBG has done and can do to operationalize its support of the development of each of the digital capabilities in the WBG’s client countries. The recommendations have been developed through a review of WBG’s past and present digital development projects and through interviews with WBG’s Task Team Leaders. We will finish the chapter by putting these recommendations into the context of WBG’s COVID-19 response.

Digital capabilities are not an area that WBG has traditionally focused on. A few exceptions exist, such as “Leveraging ICT for Growth Employment and Governance” in Bangladesh, which successfully increased digital leadership, skills and culture for more than 30,000 local CEO’s, middle managers and youth – more than a third women.<sup>61</sup> Nevertheless, as we will show below, many of WBG’s initiatives and support have tangentially supported the development of digital capabilities and it is an area that should receive greater focus in the post-COVID-19 era.

## DIGITAL CAPABILITIES FOR WHOLE-OF-NATION DIGITAL TRANSFORMATION STRATEGIES

As mentioned in the introduction of this study, as the digital economy expands and as countries are developing their digital maturity, there is a need for increased focus on coherent digital transformation strategies for a whole-of-nation approach. To succeed, digital transformation of countries, regions or cities must be driven by leadership and include strategies that address digital skills for all and fosters a digital culture. This approach would align the undergirding institutional structures, the physical and immaterial enablers of a digital economy and digital capabilities towards the ambition of the digital transformation strategy – thereby enabling the desired outcomes. To support this work the WBG five pillar framework of the digital economy (part of WBG’s flagship DE4A initiative)<sup>62</sup> could be updated with the digital capability perspective. The pillar of “digital skills” in the digital economy framework could be updated and renamed “digital capabilities” and consequently updating the DECA framework as well. This would serve as an appropriate foundation for areas of support to client countries related to digital government transformation, digital platforms, digital strategies and so forth and provide solid analytical foundation for up-stream strategic advice for government. As connectivity expands, more demand will be seen in this type of whole-of-nation frameworks and applications.

---

61 <https://projects.worldbank.org/en/projects-operations/project-detail/P122201>

62 <https://www.worldbank.org/en/programs/all-africa-digital-transformation> and <http://pubdocs.worldbank.org/en/312571561424182864/062519-digital-economy-from-africa-initiative-Tim-Kelly.pdf>

The strength of the digital capability framework in this regard, is that it links strategy to execution and outcome, and it includes structures, enablers and capabilities in an operating model looking at the ability of the system to produce a desired outcome.

## OPERATIONALISATION OF DIGITAL LEADERSHIP

Evidence indicates that for governments to effectively execute the national high-level digital transformation strategy, departments and agencies need the right structures, operating model, roles, responsibilities, mandates, and skills to deliver. In-house technology skills in government are often flagged as the biggest challenge in transforming government to a digital model, suggesting that digital leaders in Ministries of ICT, or Digital Economy, or Digital Agencies - need to drive recruitment and capacity-building initiatives to support the success of their plan. Having the budget and mandate to recruit external expertise to the CxO office, or into government departments, is a critical success factor.

The necessary skills cover a vast range of specialized technology verticals - ranging from digital infrastructure expertise (telecommunications, connectivity, cloud computing), to content management and software application development, online services development (web service developers, system programmers, application developers) and database management expertise (overseeing the collection, curation, management, analysis, and use of advanced big data analytics/AI tools). This could mean WBG engaging technology experts to work directly with government departments and engaging in supporting digital leadership in building the fit for purpose digital capabilities. To support this type of engagement, the WBG could redesign and expand a platform for digital leadership providing resources such as the digital capability course for policy makers, peer to peer connect - such as the HELP network and other resources. Such a platform would position the WBG as a leading agency for digital leadership support.

The digital capability perspective should also impact the implementing arrangements of WBG operations. Support for implementation such as the Project Implementation Units or Project Implementation Agencies could emphasise the opportunities for building digital capabilities in the respective Ministry or Agency. Hiring international or external expertise could be mandated with “capability transfer” and sharing knowledge in for example agile development or co-creation.

Other concrete pathways for operationalization of the leadership component include:

- » Financing institution strengthening and capacity building of ICT Ministries or Agencies. These Ministries, Departments or Agencies are sometimes designated as Digital Economy Ministries / Agencies, Digital Transformation Ministries / Agencies or other names along these lines. We have provided financing to these institutional bodies in previous lending operations for Kenya (KTCP), Rwanda (e-Rwanda), Burkina (e-Burkina) etc.
- » Institutional strengthening: Funding for the creation of a leading Digital Agency/Authority or Digital Ministry, including the legal and regulatory framework and the staffing. For example, WBG is promoting the creation of data privacy agencies, in several of our projects. In the past, we have funded Telecoms regulatory authority, and competition authorities/agencies.
- » Create new leadership positions for digital within the existing civil service – such as CIO, CDO, or the CTO positions, as earlier described in this chapter. The WBG often provide lending for specialized leadership functions like cybersecurity, for which we support creation and staffing of CERTs (Cybersecurity Emergency Response Team).
- » Provide funding and technical assistance for leadership training in combination with developing digital transformation strategies.
- » Providing financing to recruit residential advisors and experts with international expertise to support and transfer knowledge to our existing project counterparts.
- » Providing financing for sharing cross-country expertise, such as providing funding for knowledge exchanges and study tours between several countries (South-South exchange).
- » Provide funding for establishing an operating model driven by leadership as enabler for digital transformation, from the whole-of-nation perspective guided by the digital capability framework – reshaping the administration's ICT/Digital workforce for the 21<sup>st</sup> century.

These typical components require an investment in the \$2-\$10 Million range, depending on their scope, breadth and depth, and size of government at hand. Components can be scientifically calculated based on our past funding of such activities; and on a per unit basis (e.g., leadership position created per agency involved, investments in law or digital act reform, cost of South-South knowledge exchange initiatives, etc.). The WBG continues to build experience that can help inform these estimates, e.g., the “Enhancing Digital Government and Economy Project” (EDGE)<sup>63</sup>, which is a follow-on project to the “Leveraging ICT for Growth Employment and Governance” project mentioned at the

beginning of this chapter. The EDGE project will fund the (i) set up and operations of a digital leadership centre, (ii) promote digital innovation through research centres and strengthening of intellectual property institutions and laws, and (iii) carry out immediately needed training on digital skills and culture for more than 100,000 youth. These activities will be done in partnerships with the local private sector and academia; and with international universities that have strong records in building such digital capabilities (e.g., the e-Government Leadership Center in the National University of Singapore). Projects of this scale will provide important learnings that can be leveraged when including digital capabilities in WBG programs.

## OPERATIONALISATION OF DIGITAL SKILLS

The World Bank Group has invested significantly in digital skills delivery through its active and pipeline investment operations. In the Digital Development Global Practice, digital skills programs have been financed for public servants in existing digital transformation projects. Examples of these activities can be found in Rwanda, Kenya, Bangladesh and many other client countries. Some of these projects detail the exact number of people to be trained (for example – 5,000 civil servants) while others help create or strengthen civil service academies and provide guidance on number of civil servants to be trained. Still, other activities focus on digital skills training, youth development, and encouraging entrepreneurship, for instance in e-Burkina and e-Gabon.

Other more concrete pathways for operationalization of the digital skills component include:

- » Continue to finance digital skills as part of the Education Global Practice’s education sector reforms - offering financing for teachers and students as part of a comprehensive transformation of school curricula, for every student to acquire foundational digital skills; and every teacher to acquire intermediate digital skills. Examples include the Education Global Practice’s projects in Bangladesh “Accelerating and Strengthening Skills for Economic Transformation” and “Higher Education Acceleration Transformation” and the upcoming project “Private Investment & Digital Entrepreneurship” project, which provides includes limited-scale training on digital entrepreneurship and skills to complement its main activities of building high-tech parks.<sup>64</sup>

---

64 <https://projects.worldbank.org/en/projects-operations/project-detail/P167506>, <https://projects.worldbank.org/en/projects-operations/project-detail/P168961> and <https://www.worldbank.org/en/news/loans-credits/2020/06/19/bangladesh-private-investment-and-digital-entrepreneurship-project>

- » Perform impact analysis of existing digital skills components in upcoming projects. This study's research found that there have been no impact evaluations performed on projects with digital skills components except on a single activity, which involved gamification for learning outcomes. The findings of this impact evaluation identified a strong correlation between gamification in on-line learning content and better test results.
- » Intensify WBG's "peer-to-peer knowledge exchange" programs and study tours to address the dissemination of digital skills and knowledge about how to build them.
- » Communicate the availability of free resources for upskilling staff and citizens among client countries – e.g., the WBG's Map of Digital Capabilities (see Box 7: World Bank: Map/Catalogue of Digital Capabilities **Error! Reference source not found.**).
- » Provide massive digital upskilling to civil servants in key areas and government contractors; to acquire at least intermediate skills – as was recently done for the eBangladesh project.
- » Understand through impact evaluation: Technical assistance and lending on digital skills for the future of work based on systematic evaluation of current WBG operations.

## OPERATIONALISATION OF DIGITAL CULTURE

The World Bank Group has not invested explicitly in digital culture, except in few niche areas such as:

- » Fostering Trust in Digital society through cybersecurity awareness raising and training.
- » Communication campaigns encouraging people to adopt digital transactions online (as opposed to the traditional paper-based methods where people transact face to face in physical offices).
- » Enacting reforms such as "paperless government", "Ask Once", and "open data" regulations.
- » Provide incentives for adopting online services, and digital transactions - such as online registration for schools/universities; or digital payments (wave fees, provide points, etc.).
- » Invest in regular innovation and crowdsourcing activities in partnership with private sector and academia, as well as youth associations.
- » Finance stakeholder consultations, ethnographic studies, communication campaigns, and partnerships between telecoms actors and communication or information agencies to strengthen the change management

aspect – which needs to be pervasive, adapted to local context, and scaled-up at a national scale – for digital culture to prevail.

Digital culture can be integrated into WBG operations as specific components, which can for example be linked with digital leadership components that promote the “digital first” mindset among the key players of the digital transformation. Going forward, this component, the least developed/recognized, will need further analysis possibly through future analytical work and impact evaluation.

## COVID-19 MITIGATION AND THE STRENGTHENING OF DIGITAL CAPABILITIES IN CLIENT COUNTRIES

The four thematic pillars of the WBG crisis response are strongly aligned with the digital capabilities explored in this study. Digital is critical to enable remote work and education during the social distancing rules imposed by the pandemic. Under the WBG COVID-19 crisis response (cf. Figure 5), Pillar 3 and 4 require strong and sustained digital leadership, skills and culture especially for the long term “resilient recovery stage” where digital capabilities will enable building back in better, smarter, more sustainable manner the institutions and infrastructures distressed by COVID-19.

World Bank emergency support to health, education, social protection interventions for saving lives and protecting poor and vulnerable people from the impact of the economic and social crisis triggered by the pandemic, will require World Bank clients to be fully equipped with digital skills to work remotely. The leadership around the shift to digital, on our client’s side, is key to the recovery and resilience. The ability to work and learn remotely is directly related to the enabling environment (leadership, culture, and availability of digital services and infrastructure) as well as the ubiquity of digital skills, above and beyond schools and education systems. Last but not least, cybersecurity and resiliency are key priority areas to grow in today’s digital leaders’ agendas, and infrastructure budgets.

The massive unemployment generated by COVID-19 highlights the importance of digital transformation, as on-line companies offering goods and services have thrived, judging by the valuation of the IT industry companies, from Amazon to Netflix (a tripling of market value for some).

With remote work and remote learning, everyone needs to have basic/foundational skills. In addition, job seekers of all ages have a much higher chance of being recruited, especially job seekers with intermediate, advanced, and highly specialized digital skills. The recovery and long-term development prospects of International Development Association (IDA) countries will require

a sharpened focus on the four cross-cutting issues under IDA19: debt, technology, human capital, and disability inclusion. This digital capability study covers both technology and human capital development. Thus, the implementation of its recommendations, through intentional design of digital capabilities components in WBG digital development, and education operations, will support a faster COVID-19 recovery.

**FIGURE 5**  
**WBG Financing Capacity for COVID-19 Crisis Response (WBG 2020)<sup>1</sup>**

WBG COVID-19 CRISIS RESPONSE PARTNERSHIPS				
UN AGENCIES	IMF & MDBS	PRIVATE SECTOR	VACCINE PARTNERSHIPS	CIVIL SOCIETY
WBG COVID-19 CRISIS RESPONSE		RELIEF STAGE	RESTRUCTURING STAGE	RESILIENT RECOVERY STAGE
<b>PILLAR 1</b> Saving Lives		Public health emergency	Restructuring health systems	Pandemic-ready health systems
<b>PILLAR 2</b> Protecting the poor & vulnerable		Social emergency	Restoring human capital	Building equity and inclusion
<b>PILLAR 3</b> Ensuring sustainable business growth & job creation		Economic emergency	Firm restructuring & debt resolution	Green business growth & job creation
<b>PILLAR 4</b> Strengthening policies, institutions and investments for rebuilding better		Maintain line of sight to long-term goals	Policy and institutional reforms	Investments to rebuild better

1 <http://documents1.worldbank.org/curated/en/136631594937150795/pdf/World-Bank-Group-COVID-19-Crisis-Response-Approach-Paper-Saving-Lives-Scaling-up-Impact-and-Getting-Back-on-Track.pdf>



- Choi, Jieun, Mark A. Dutz, and Zainab Usman, eds. 2020. "The Future of Work in Africa: Harnessing the Potential of Digital Technologies for All". Africa Development Forum. World Bank.
- Choi, Jieun, Mark A. Dutz, and Zainab Usman, eds. 2020. "The Future of Work in Africa: Harnessing the Potential of Digital Technologies for All". Africa Development Forum. World Bank.
- Chow, Anthony. 2013. "The Usability of Digital Information Environments: Planning, Design and Assessment." in *Trends, Discovery, and People in the Digital Age*. Chandos Publishing.
- Chow, Tiffany, and Maria Charles. 2019. "An Inegalitarian Paradox" in *Cracking the Digital Ceiling, Women in Computing Around the World*. <https://www.cambridge.org/core/books/cracking-the-digital-ceiling/5B74B6983B2DD0E9FC341459FA855C6B>
- Clastornik, J. 2019, August 5. The Digital Citizen is Here — Are Governments Ready? *Apolitical*. [https://apolitical.co/en/solution\\_article/the-digital-citizen-is-here-are-governments-ready](https://apolitical.co/en/solution_article/the-digital-citizen-is-here-are-governments-ready)
- Collado, Cecilia Castaño, 2014, "Women's access to ICTs in the information society", in *Media and gender: a scholarly agenda for the Global Alliance on Media and Gender*, UNESCO. <http://www.unesco.org/new/en/communication-and-information/resources/publications-and-communication-materials/publications/full-list/media-and-gender-a-scholarly-agenda-for-the-global-alliance-on-media-and-gender/>
- Coombes, R., Coppola, M., Hatfield, S., Nuerk, C. 2018. "Voice of the Workforce in Europe: Understanding the Expectations of the Labour Force to Keep Abreast of Demographic and Technological Change." <https://www2.deloitte.com/content/dam/Deloitte/at/Documents/human-capital/at-deloitte-insights-eu-ropean-workforce-survey.pdf>
- Coombes, R., Coppola, M., Hatfield, S., Nuerk, C., 2018. "Voice of the Workforce in Europe: Understanding the Expectations of the Labour Force to Keep Abreast of Demographic and Technological Change." <https://www2.deloitte.com/content/dam/Deloitte/at/Documents/human-capital/at-deloitte-insights-eu-ropean-workforce-survey.pdf>
- Cooper, A. 2004. "The Inmates are Running the Asylum: [Why High-tech Products Drive Us Crazy and How to Restore the Sanity] (Vol. 2)". Indianapolis: Sams.
- Corydon, B., Ganesan V., Lundqvist, M. 2016. "Digital by Default: A Guide to Transforming Government.", McKinsey Center for Government. <https://www.mckinsey.com/~/media/mckinsey/industries/public%20sector/our%20insights/transforming%20government%20through%20digitization/digital-by-default-a-guide-to-transforming-government-final.ashx>
- Coward, C. and Fellows, M. 2018. "Digital Skills Toolkit", International Telecommunication Union. <https://www.itu.int/en/ITU-D/Digital-Inclusion/Youth-and-Children/Pages/Digital-Skills-Toolkit.aspx>
- Creighton, Theodore B. 2018. "Digital Natives, Digital Immigrants, Digital Learners: An International Empirical Integrative Review of the Literature." ICPEL Education Leadership Review, Vol. 19, No. 1– December, 2018. <https://files.eric.ed.gov/fulltext/EJ1200802.pdf>
- Day, R. 2019. The Top 10 Most Important IT Skills for 2019. <https://www.globalknowledge.com/us-en/resources/resource-library/articles/the-10-most-important-it-skills-for-2019/>
- Deloitte Insights and Beeck Center for Social Impact at Georgetown University. 2018. "Chief Data Officer in Government: A CDO Playbook." [https://www2.deloitte.com/content/dam/insights/us/articles/5004\\_CDO-Data-strategy/DI\\_CDO-in-govt-playbook.pdf](https://www2.deloitte.com/content/dam/insights/us/articles/5004_CDO-Data-strategy/DI_CDO-in-govt-playbook.pdf)
- Deloitte. 2019. Co-Creation for Impact: How to Design Multi-Stakeholder Initiatives for Tackling Wicked Problems. <https://www2.deloitte.com/us/en/insights/industry/public-sector/design-thinking-co-creation.html>
- Demos Helsinki. Unbounded government – Opportunities for developing new government practices. 2018. <https://www.demoshelsinki.fi/en/julkaisut/unbounded-government-opportunities-for-developing-new-government-practices/>
- Digital Education Team. 2020. "Digital Capabilities Toolkit.", University of Plymouth. <https://www.plymouth.ac.uk/about-us/teaching-and-learning/digital-education/digital-capabilities-toolkit>
- Digital Skills Global. 2018. 50 South Africans Achieve International Digital Skills Certification. <https://digitalskills-global.com/blog/50-south-africans-achieve-international-digital-skills-certification>

- Digital Skills Global. 2020. The Top 10 Digital Skills Tech Companies Are Looking for Today. <https://digitalskills-global.com/blog/the-top-10-digital-skills-tech-companies-are-looking-for-today>
- Digital Transformation Institute of Capgemini Consulting. 2017. The Digital Culture Challenge: Closing the Employee-Leadership Gap. [https://www.capgemini.com/consulting/wp-content/uploads/sites/30/2017/07/dti\\_digitalculture\\_report.pdf](https://www.capgemini.com/consulting/wp-content/uploads/sites/30/2017/07/dti_digitalculture_report.pdf)
- Digital Work Research. 2018. The Digital Workplace Skills Framework: Ensuring the Workforce is Ready to Work Digitally. <https://digitalworkresearch.com/wp-content/uploads/2018/08/The-Digital-Workplace-Skills-Framework-final.pdf>
- DiMaggio, P. Hargittai, E. Celeste, C. and Shafer, S. 2004. Digital Inequality: From Unequal Access to Differentiated Use. In *Social Inequality*, Russell Sage Foundation.
- Discerning Digital. 2020. The Rewards of Agility in a Competitive Digital World. <https://digitalbusinessstratification.co.uk/post/169228472446/the-rewards-of-agility-in-a-competitive-digital>
- Dunleavy, P., and Helen Margetts. 2015. "Design Principles for Essentially Digital Governance." LSE Research Online. <http://eprints.lse.ac.uk/64125/1/Essentially%20Digital%20Governance.pdf>
- Dunleavy, P., Helen Margetts, Simon Bastow, and Jane Tinkler. 2006. *Digital Era Governance: IT-Corporations, the State and E-government*, Oxford University Press. <https://global.oup.com/academic/product/digital-era-governance-9780199547005?cc=gb&lang=en&>
- Eggers, W. D., and Bellman, J. 2015. *The Journey to Government's Digital Transformation*.
- Deloitte University Press. [https://www2.deloitte.com/content/dam/insights/us/articles/digital-transformation-in-government/DUP\\_1081\\_Journey-to-govt-digital-future\\_MASTER.pdf](https://www2.deloitte.com/content/dam/insights/us/articles/digital-transformation-in-government/DUP_1081_Journey-to-govt-digital-future_MASTER.pdf)
- Elements of AI. 2020. Welcome to the Elements of AI (free online course). <https://www.elementsofai.com/>
- Ernst & Young. 2015. "Digital Capability Framework." [https://www.ey.com/Publication/vwLUAssets/ey-digital-transformation-for-2020-and-beyond/\\$FILE/ey-digital-transformation-for-2020-and-beyond.pdf](https://www.ey.com/Publication/vwLUAssets/ey-digital-transformation-for-2020-and-beyond/$FILE/ey-digital-transformation-for-2020-and-beyond.pdf)
- Ernst & Young. 2015. Agents of Change. [https://www.ey.com/Publication/vwLUAssets/EY\\_-\\_How\\_government\\_CTOs\\_can\\_drive\\_digital\\_transformation/\\$FILE/EY-government-CTO.pdf](https://www.ey.com/Publication/vwLUAssets/EY_-_How_government_CTOs_can_drive_digital_transformation/$FILE/EY-government-CTO.pdf)
- Ernst & Young. 2017. Driving Citizen Centricity. [https://www.ey.com/Publication/vwLUAssets/EY-what-is-driving-gcc-governments-to-deliver-better-citizen-experiences/\\$FILE/EY-what-is-driving-gcc-governments-to-deliver-better-citizen-experiences.pdf](https://www.ey.com/Publication/vwLUAssets/EY-what-is-driving-gcc-governments-to-deliver-better-citizen-experiences/$FILE/EY-what-is-driving-gcc-governments-to-deliver-better-citizen-experiences.pdf)
- European Commission. (n.d.) Knowledge for Policy: Technological Progress. [https://ec.europa.eu/knowledge4policy/foresight/topic/changing-nature-work/technological-progress\\_en](https://ec.europa.eu/knowledge4policy/foresight/topic/changing-nature-work/technological-progress_en)
- European Commission. 2020. Shaping Europe's Digital Future. [https://ec.europa.eu/info/sites/info/files/communication-shaping-europes-digital-future-feb2020\\_en\\_4.pdf](https://ec.europa.eu/info/sites/info/files/communication-shaping-europes-digital-future-feb2020_en_4.pdf)
- European Commission. European Industrial Strategy. [https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/european-industrial-strategy\\_en](https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/european-industrial-strategy_en)
- European Union Science Hub. 2019. "Digital Competence Framework for Education (DigComEdu)." <https://ec.europa.eu/jrc/en/diqcompedu>
- European Union Science Hub. 2019. "Learning and Skills for the Digital Era." <https://ec.europa.eu/jrc/en/research-topic/learning-and-skills>
- Falck, O., A. Heimisch and S. Wiederhold. 2016. "Returns to ICT Skills." OECD Education Working Papers 134, OECD Publishing, Paris. <http://dx.doi.org/10.1787/5ijzfl2p5rzq-en>
- Fishmann, Hosea, Datar. 2016. Rx CX: Customer Experience as a Prescription for Improving Government Performance. Deloitte Insights. <https://www2.deloitte.com/us/en/insights/industry/public-sector/improving-customer-experience-government-performance.html>
- General Electric. 2016. "Digital Industrial Transformation Playbook: Capabilities Pillar." [https://www.ge.com/digital/sites/default/files/download\\_assets/digital-industrial-transformation-playbook-capabilities-whitepaper.pdf](https://www.ge.com/digital/sites/default/files/download_assets/digital-industrial-transformation-playbook-capabilities-whitepaper.pdf)
- Gill, K.S. (ed). 2012. *Human Machine Symbiosis: The Foundations of Human-centred Systems Design*. Springer.
- Govtech Singapore. (n.d.) Moments of Life. <https://www.tech.gov.sg/products-and-services/moments-of-life/>

- Gregg, C., Hofmann, C., Khachatryan, L., Luksha, P., Strietska-Illina, O., Sudakov, D. 2016. "Skills Technology Foresight Guide", International Labour Organization. [https://www.ilo.org/wcmsp5/groups/public/---ed\\_emp/---ifp\\_skills/documents/publication/wcms\\_534225.pdf](https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---ifp_skills/documents/publication/wcms_534225.pdf)
- Gupte, V. 2019, August 30. Transparency: Cultural Pillar of Digital Transformation. *People Matters*. <https://www.peoplesmattersglobal.com/article/culture/transparency-cultural-pillar-of-digital-transformation-22913>
- Harvard Business Review. 2010. Using Customer Journey Maps to Improve Customer Experience. <https://hbr.org/2010/11/using-customer-journey-maps-to>
- Heath, A. 2015, December 4. This App is Helping Blind People Navigate the World. *Business Insider*. <https://www.businessinsider.com/wayfindr-maps-subway-stops-for-the-blind-2015-12?IR=T>
- Helfat et al. 2007. "Dynamic Capabilities: Understanding Strategic Change in Organizations". Wiley.
- Hess, A. 2019. The 25 Most In-Demand Technical Skills of 2019, according to LinkedIn. <https://www.cnbc.com/2019/01/08/the-25-most-in-demand-technical-skills-of-2019-according-to-linkedin.html>
- Hofstede Insights. 2020. National Culture. <https://hi.hofstede-insights.com/national-culture>
- Hofstede, G., Hofstede, G. J., and Minkov, M. 1991/2010. *Cultures and Organizations: Software of the Mind*. Third edition 2010. New York: McGraw-Hill Professional.
- International Finance Corporation – World Bank Group. 2009. Measuring Impact Framework Methodology: Understanding the Business Contribution to Society. <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/550171468338972685/measuring-impact-framework-methodology-understanding-the-business-contribution-to-society>
- International Telecommunication Union. 2019, November. Digital Inclusion Of All. <https://www.itu.int/en/mediacentre/backgrounders/Pages/digital-inclusion-of-all.aspx>
- ITU. 2020. <https://www.itu.int/en/ITU-D/Digital-Inclusion/Pages/default.aspx>
- Jcom. 2019. The Role of Digital User Feedback in a User-Centred Development Process in Citizen Science. [https://jcom.sissa.it/sites/default/files/documents/JCOM\\_1801\\_2019\\_A03.pdf](https://jcom.sissa.it/sites/default/files/documents/JCOM_1801_2019_A03.pdf)
- Joshi, A.M. 2017. The Great Indian Leapfrog. <https://www.imd.org/research-knowledge/articles/the-great-indian-leapfrog/>
- Kasoji, U. 2017, August. Adaptable, Agile & Fast: Process Principles for Digital Business. *Cognizant*. <https://www.cognizant.com/whitepapers/adaptable-agile-fast-process-principles-for-digital-business-codex2772.pdf>
- Khalid, M.S. and Buus, L. 2017. A Theoretical Framework Mapping Barriers of Integrating and Adopting Educational Technology. Research and Practice in Technology Enhanced Learning. Asia-Pacific Society for Computers in Education. [https://www.academia.edu/17081270/A\\_Theoretical\\_Framework\\_Mapping\\_Barriers\\_of\\_Integrating\\_and\\_Adopting\\_Educational\\_Technology](https://www.academia.edu/17081270/A_Theoretical_Framework_Mapping_Barriers_of_Integrating_and_Adopting_Educational_Technology)
- Krebs, A. 2012. Education and Access to Digital Culture: The Current Situation and Future Directions for European Culture. *Education & Learning Working Group*. <http://www.houseforculture.eu/upload/Docs%20ACP/educationdigitalencatcannekrebsENGL.pdf>
- Kumar, Kumar, and Kumar. 2014. E-Governance in India: Definitions, Challenges and Solutions. <https://arxiv.org/ftp/arxiv/papers/1411/1411.1876.pdf>
- Lafley, A.G., and Martin R.L. 2013. *Playing to Win: How Strategy Really Works*.
- Law, N., de la Torre, J., Wong, G., Woo, D. 2018. "A Global Framework of Reference on Digital Literacy Skills for Indicator 4.4.2", UNESCO Institute for Statistics, Information Paper no.51. <http://uis.unesco.org/sites/default/files/documents/ip51-global-framework-reference-digital-literacy-skills-2018-en.pdf>
- Learn to Code. 2020. 17 In-Demand Technology Skills to Learn in 2020. <https://learntocodewith.me/posts/tech-skills-in-demand/>
- Lloyds Bank. 2018. UK Business and Charity Digital Index 2018. The fifth edition – Benchmarking the Digital Capability and Skills of UK SMEs and Charities.

- Loyalka et al. 2019. Computer Science Skills across China, India, Russia, and the United States. PNAS. 116 (14). <https://www.pnas.org/content/pnas/116/14/6732.full.pdf>
- Maffei, S., Mortati, M., Villari, B. 2014. "Design Capabilities for Value Creation." <https://www.researchgate.net/publication/269996253>
- Maffei, Stefano, Marzia Martati, and Beatrice Villari. 2016. Design Management in an Era of Disruption. Conference Paper for Design Capabilities for Value Creation Conference. <https://davidjcmorris.com/2016/10/understanding-capability-competence-and-capacity/>
- Mayer, R. 2010. "Learning with technology", in Dumont, H., D. Istance and F. Benavides (eds.), The Nature of Learning: Using Research to Inspire Practice, OECD Publishing, Paris. <https://doi.org/10.1787/9789264086487-10-en>
- McKinsey & Company. 2017, July 20. Culture For a Digital Age. <https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/culture-for-a-digital-age>
- McKinsey & Company. 2020. The Future is Now: Closing the Skills Gap in Europe's Public Sector. <https://www.mckinsey.com/industries/public-sector/our-insights/the-future-is-now-closing-the-skills-gap-in-europes-public-sector>
- Microsoft. 2016. "Digital transformation: Seven steps to success." <https://info.microsoft.com/rs/157-GQE-382/images/Digital%20transformation%20seven%20steps%20to%20success.v2.pdf?alid=860635945>
- Microsoft. 2018. "Digital capabilities for a cloud-first, mobile-first education." <https://www.slideshare.net/JISC/digital-capabilities-for-a-cloudfirst-mobilefirst-education>
- MIT Sloan, Management Review, Daugherty, Wilson, Ghosh, and Shukla. 2020. How Leading Organizations are Getting the Most Value from IT. <https://sloanreview.mit.edu/article/how-leading-organizations-are-getting-the-most-value-from-it/>
- MIT-CDB and Capgemini Consulting. 2012. Governance: A Central Component of Successful Digital Transformation. [https://www.capgemini.com/wp-content/uploads/2017/07/Governance\\_A\\_Central\\_Component\\_of\\_Successful\\_Digital\\_Transformation.pdf](https://www.capgemini.com/wp-content/uploads/2017/07/Governance_A_Central_Component_of_Successful_Digital_Transformation.pdf)
- Monahan, Chmiola, and Roos. 2017. MIT Sloan Management Review: How Effective Leaders Drive Digital Change. <https://sloanreview.mit.edu/article/how-effective-leaders-drive-digital-change/>
- Mukerjee, D. 2019, August 27. Agility to Drive Digital Transformation. *People Matters*. <https://www.peoplemattersglobal.com/article/culture/agility-to-drive-digital-transformation-22757>
- Mukherjee, A.S. 2020. 5 Musts for Next-Gen Leaders. <https://sloanreview.mit.edu/article/5-musts-for-next-gen-leaders/>
- Nambisan, S., and Nambisan, P. 2013. Engaging Citizens in Co-Creation in Public Services: Lessons Learned and Best Practices. *IBM Centre for the Business of Government*. <http://www.businessofgovernment.org/report/engaging-citizens-co-creation-public-services>
- Navarro, Z. 2006. "In Search of a Cultural Interpretation of Power: The Contribution of Pierre Bourdieu." *IDS Bulletin*, 37 (6): 11-22.
- New Zealand Government. End of Life Service. <https://endoflife.services.govt.nz/welcome>
- Ng, W. W., Tambe, H., and Gault, S. 2019, July 25. Public Service Agility: Unleashing Innovation. *Accenture*. <https://www.accenture.com/sq-en/insights/public-service/agility>
- NSW Government. 2020. Customer Journey Mapping. <https://www.digital.nsw.gov.au/design-system/guides/user-research-methods/customer-journey-mapping>
- O'Dell, K., Newman, A., Huang, J., and Hollen, N. V. 2019, August 28. Inclusive Smart Cities: Delivering Digital Solutions For All. *Deloitte Insights*. <https://www2.deloitte.com/us/en/insights/industry/public-sector/inclusive-smart-cities.html>
- OECD (Organisation for Economic Co-operation and Development). 2015. OECD Science, Technology and Industry Scoreboard 2015, OECD Publishing, Paris. [http://dx.doi.org/10.1787/sti\\_scoreboard-2015-en](http://dx.doi.org/10.1787/sti_scoreboard-2015-en)
- OECD. 2018. "Going Digital". <http://www.oecd.org/going-digital/>

- OECD and ADB. 2019. Government at a Glance Southeast Asia 2019: Towards a Citizen-Centric Civil Service. <https://www.adb.org/sites/default/files/publication/518351/government-glance-southeast-asia-2019.pdf>
- OECD. 2016. "OECD Policy Brief on the Future of Work: Skills for a Digital World." <https://www.oecd.org/els/emp/Skills-for-a-Digital-World.pdf>
- OECD. 2016. "Skills for a Digital World." Policy Brief. <https://www.oecd.org/els/emp/Skills-for-a-Digital-World.pdf>
- OECD. 2019. "Educating 21st Century Children: Emotional Well-being in the Digital Age." <https://www.oecd-ilibrary.org/sites/2d4352c2-en/index.html?itemId=/content/component/2d4352c2-en>
- OECD. 2019. "Educating 21st Century Children: Emotional Well-being in the Digital Age." <https://www.oecd-ilibrary.org/sites/71b7058a-en/index.html?itemId=/content/component/71b7058a-en>
- OECD. Effective Organisational & Governance Coordination Framework. <http://www.oecd.org/governance/digital-government/toolkit/principle7/>
- Olphert, W., and Damodaran, L. 2007. "Citizen Participation and Engagement in the Design of e-government Services: The Missing Link in Effective ICT Design and Delivery." *Journal of the Association for Information Systems* 8 (9): 27.
- Omar, Abdul Malik. 2021. "The Whole-of-Nation Approach: The Case of Brunei Darussalam, Wawasan 2035, and the 4th Industrial Revolution" in *Handbook of Research on Global Challenges for Improving Public Services and Government Operations*
- Panetta, K. 2019. Gartner: 5 Steps to Become an Effective Digital Leader. <https://www.gartner.com/smarterwithgartner/5-steps-to-become-an-effective-digital-leader/>
- Prasadh, H., Chang, W., and Bansal, D. 2020. Data-driven Decision Making at Work in the Public Sector. *TTEC*. <https://www.ttec.com/articles/data-driven-decision-making-work-public-sector>
- Prenski, Marc. 2001. "Digital Natives, Digital Immigrants" in *On the Horizon*, MCB University Press, Vol. 9 No. 5, October 2001 <https://www.marcprensky.com/writing/Prensky%20-%20Digital%20Natives,%20Digital%20Immigrants%20-%20Part1.pdf>
- PwC. 2017. "State of Digital Talent: Digital IQ 2017-Canadian Insights." <https://www.pwc.com/ca/en/services/consulting/publications/digital-iq-survey-2017-state-of-digital-talent.html> PwC. 2015. "Accelerating Innovation Through Responsible AI." <https://www.pwc.co.uk/services/risk-assurance/insights/accelerating-innovation-through-responsible-ai.html>
- Reyes, M. 2019, August 20. Digital Transformation Helps Governments be More Inclusive. *Microsoft Industry Blogs*. <https://cloudblogs.microsoft.com/industry-blog/government/2019/08/20/digital-transformation-helps-governments-be-more-inclusive/>
- Roman, Alexandru. 2013. "Realizing E-government: Delineating Implementation Challenges and Defining Success." [https://www.researchgate.net/publication/264273654\\_Realizing\\_e-government\\_Delineating\\_implementation\\_challenges\\_and\\_defining\\_success](https://www.researchgate.net/publication/264273654_Realizing_e-government_Delineating_implementation_challenges_and_defining_success)
- Rowley, J. 2011. "E-Government Stakeholders—Who Are They and What Do They Want?" *International Journal of Information Management* 31 (1): 53-62.
- Senge, P., Kleiner, A., Roberts, C., Ross, R., Roth, G., Smith, B., and Guman, E. C. 1999. "The Dance of Change: The Challenges to Sustaining Momentum in Learning Organizations." *Performance Improvement*, 38 (5): 55-58.
- Sense Corp. 2020. The Data Journey to Citizen-Centric Digital Government. <https://sensecorp.com/the-data-journey-to-citizen-centric-digital-government/>
- Simmons, R., Tymms, A., Zecha, J. 2016. "Measuring a Company's Digital Competence." Bain & Company. <https://www.bain.com/insights/measuring-companys-digital-competence/>
- Singapore Infocomm Media Development Authority. 2019. Digital Economy Framework for Action. <https://www.imda.gov.sg/infocomm-media-landscape/SGDigital/Digital-Economy-Framework-for-Action>
- SmartStart. Find the Right Services for You and Your Child. <https://smartstart.services.govt.nz/>
- Sturm, U. and Tscholl, M. 2019 "The role of digital user feedback in a user-centred development process in citizen science." <https://doi.org/10.22323/2.18010203>

- Susskind, R., and Susskind, D. 2015. *The Future of the Professions: How Technology Will Transform the Work of Human Experts*. Oxford, UK: Oxford University Press.
- Tampoe, M. 1994. "Exploiting the core competences of your organization." *Long Range Planning* 27 (4): 66-77.
- Thaler, R. H., and Sunstein, C. R. 2008. *Nudge: Improving Decisions About Health, Wealth and Happiness*. London, UK: Penguin Books.
- Tigo. Mobile Birth Registration. <https://www.tigo.co.tz/mobile-birth-registration>
- Trompenaars Hampden-Turner Consulting. 2018. Cultural Transformation in the Digital World: Research Report 2018. <http://exdmarketing.smu.edu.sg/acton/media/11523/cultural-transformation-in-the-digital-world>
- Unilever. 2016. "The Digital Capability Framework Methodology.", Business transformation in operation(s), Luyckx, F.
- Uzelac, A. 2008. "How to Understand Digital Culture: Digital Culture – A Resource for a Knowledge Society?" In A. Uzelac and B. Cvjetèanin (Eds.), *Digital Culture: The Changing Dynamics* (pp. 7-21). Zagreb, Croatia: Institute for International Relations.
- Vygotsky, L. S. 1978. *Mind in Society: The Development of Higher Psychological Processes*. Cambridge, MA: Harvard University Press.
- Welchman, Lisa. 2015. "The Basics of Digital Governance." In *Managing Chaos: Digital Governance by Design*. Rosenfeld Media.
- Westerman, G., Bonnet, D., and McAfee, A. 2014. *Leading Digital: Turning Technology into Business Transformation*. Harvard Business Press.
- Wharton. 2019. How Closing the Digital Literacy Gap Helps Workers — and Employers. Knowledge@Wharton. October 03. <https://knowledge.wharton.upenn.edu/article/how-a-digital-literacy-list-can-help-workers-and-employers/>
- World Bank Group. 2019. "Digital Jobs for Youth in Fragile, Conflict and Violence (FCV) Setting: Lessons from the Click-On Kaduna Pilot." Knowledge Brief Series, Issue 7. <https://www.s4ye.org/sites/default/files/2020-01/S4YE%20Knowledge%20Brief%207%20-%20Digital%20Jobs%20for%20Youth%20in%20FCV%20Settings%2C%20Click-On%20Kaduna%20%28Final%29.pdf>
- World Bank Group. 2020. "Saving Lives, Scaling-up Impact and Getting Back on Track World Bank Group COVID-19 Crisis Response Approach Paper".
- World Bank, ITU, GSMA and WEF. 2020. COVID-19 Crisis Response: Digital Development Joint Action Plan and Call for Action. <http://pubdocs.worldbank.org/en/788991588006445890/Speedboat-Partners-COVID-19-Digital-Development-Joint-Action-Plan.pdf>
- World Bank. 1992. Governance and Development. Washington, DC: World Bank. <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/604951468739447676/governance-and-development>
- World Bank. 2016. World Development Report 2016: Digital Dividends. <https://www.worldbank.org/en/publication/wdr2016>
- World Economic Forum. 2018, December. Our Shared Digital Future Building an Inclusive, Trustworthy and Sustainable Digital Society. [http://www3.weforum.org/docs/WEF\\_Our\\_Shared\\_Digital\\_Future\\_Report\\_2018.pdf](http://www3.weforum.org/docs/WEF_Our_Shared_Digital_Future_Report_2018.pdf)

