

In collaboration with
FTI Consulting



Digital Transition Framework: An action plan for public-private collaboration

WHITE PAPER
JANUARY 2023

Contents

3	Foreword
4	Leadership perspective on the digital transition
5	Introduction: A guiding framework for the digital transition
7	1 Digital and sustainable transformation of industries
9	2 Universal adoption of affordable digital services
11	3 Strategic development of new technologies
13	4 Digital skills and human capital
15	5 Trust, security and protection
17	6 Cross-border trade and cooperation
20	Annex
23	Contributors

Disclaimer

This document is published by the World Economic Forum as a contribution to a project, insight area or interaction. The findings, interpretations and conclusions expressed herein are a result of a collaborative process facilitated and endorsed by the World Economic Forum but whose results do not necessarily represent the views of the World Economic Forum, nor the entirety of its Members, Partners or other stakeholders.

© 2023 World Economic Forum. All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, including photocopying and recording, or by any information storage and retrieval system.

Foreword



Cristiano Amon
President and Chief
Executive Officer,
Qualcomm Inc.;
Chair, ICT Industry,
World Economic Forum



Derek O'Halloran
Head, Shaping the Future
of Digital Economy and
New Value Creation; Member
of the Executive Committee
World Economic Forum

The world has entered a profound period of transition where we are seeing incredible development of new technologies transform economies and inspire future generations. Breakthroughs in connectivity, biotechnology, quantum and exascale computing, and artificial intelligence, as well as the metaverse, advancements in industrial robotics and an emerging space economy, hold extraordinary promise for human development, economic productivity and sustainability goals. This rapid pace of innovation requires a clear vision combined with substantial investments and collaboration across all sectors.

Yet, in the first few years of the 2020s public-private, leaders have responded to countless economic, social, and environmental pressures – forcing many to make a trade-off between long-term technology investments or focusing on short-term needs. So, what can be done?

Ultimately, digital technology is the *key enabler* for the broad set of challenges business and governments face. It is one of our most important toolkits for future success; for example, the capacity to reduce emissions in hard-to-abate sectors by as much as 20% by 2050.

Governments and businesses are increasingly working together through strategic economic planning and targeted investments. As they do so, developing a straightforward roadmap for utilizing technology is a critical component to drive success across all other goals.

We are already on a path to full digitization of our societies and industries. Adapting to a digital-first marketplace is a top priority for businesses across all sectors, including health, finance, heavy industry, energy and mobility. However, we have a long way to go, especially as 2.9 billion people worldwide still do not benefit from digital participation. Collaboration, agile policies and continuous investments in connectivity, skills, devices and relevant content are needed to accelerate progress and achieve the ambitions of an inclusive digital economy.

As countries navigate the impacts of the digital transition, private-public collaboration is essential. Governments play an important role in establishing clarity through strategic priorities, and creating the right environment through monetary and foreign policies and strategic economic investments. Those countries where business and government can pool their intelligence, resources and capabilities will advance the fastest.

To this end, we offer this document as a simple, but holistic strategic framework to facilitate whole-of-economy dialogue and action. It represents a point of departure to facilitate cross-sector collaborative efforts to develop and align shared priorities, and to provide some actionable recommendations and examples for each area.

We have two hopes for this document. First, we hope that it sparks a dialogue for collective action. Second, we hope this is a living document, which evolves as we collectively learn from leading practices.

Leadership perspective on the digital transition

- “ Digital transformation across governments and industries has the potential to grow the economy and enable a brighter future for all. Now is a critical time for the public and private sectors to come together to embrace this opportunity through a shared vision and strategic planning.
Cristiano Amon, President and Chief Executive Officer, Qualcomm Inc.; Chair, ICT Industries, World Economic Forum
- “ The digital skills gap is a key barrier to inclusion and opportunity in the digital age. Closing this gap is central to unlocking new social and economic value.
José María Álvarez-Pallete, Chairman and Chief Executive Officer, Telefonica
- “ Improving broadband infrastructure enables innovation across all critical sectors. Cemented by a digitally literate population, with access to devices and pertinent content, it defines the digital transformation of our society.
Paula Ingabire, Minister of Information Communication Technology and Innovation of Rwanda
- “ At Apollo Hospitals, we have been strengthening our focus towards prevention and supporting well-being, through integration of healthcare and technology, to achieve true health equity for all.
Shobana Kamineni, Executive Vice-Chairperson, Apollo Hospitals Enterprise
- “ In the Kingdom of Bahrain, modernizing government ICT technologies is a key pillar of our growth as we transition to a digital economy.
Salman bin Khalifa Al Khalifa, Minister of Finance and National Economy of Bahrain
- “ It’s going to take real cooperation and action to deliver on the vision of a more digital world. That’s how we’ll ensure our future works for all.
Michael Miebach, Chief Executive Officer, Mastercard
- “ Deriving value from data is essential to enabling governments to advance their policy goals – everything from improving healthcare and strengthening defense to advancing industry and safeguarding the environment.
Antonio Neri, President and Chief Executive Officer, Hewlett Packard Enterprise
- “ Today, 2.6 billion people are disconnected from the digital economy, constraining those households and fragmenting the countries in which they live. We can bridge this divide through innovative financing arrangements to fund digital inclusion and other strategic initiatives.
Robert F. Smith, Founder, Chairman and Chief Executive Officer, Vista Equity Partners
- “ Building a resilient and sustainable economy is something we can only achieve together, through greater industry collaboration and investment in infrastructure, with digital transformation at the heart of our business models.
Jean-Pascal Tricoire, Chairman and Chief Executive Officer, Schneider Electric

Introduction:

A guiding framework for the digital transition

The remarkable acceleration of digitization since the beginning of the COVID-19 pandemic has reset the baseline for progress. Governments and their partners are now re-establishing their priorities and strategies for the period ahead. They do so in the context of increased expectations and urgency across multiple domains – domains where connectivity, data and intelligence are critical enablers.

However, for business and policy leaders across every industry – be it health, finance, heavy industry, energy, mobility, or economic planning – trying to navigate the ever-changing tech landscape is a challenge.

While the development of a robust, shared digital ecosystem is a whole-of-society concern, it can be difficult to track the development, opportunities, leading practices and barriers across a wide range of rapidly developing technologies and related issues.

This hampers action and slows progress. Against a fragmented landscape, it can be challenging for individual organizations to know where to focus their energy and investments, let alone to align multiple organizations under common objectives. When addressing environmental issues, there are common conceptual frameworks and science-based targets that have developed over many decades. When embarking on collaboration on digital issues, there are no such common frameworks or external targets.

This document has been developed in response to leaders in governments and business from many sectors and regions. It became clear from discussions with them that to maximize the speed of a responsible digital transition, there are six key pillars of private-public collaboration are critical:

1. Digital and sustainable transformation of industries
2. Strategic development of new technologies
3. Universal adoption of digital services
4. Digital skills and human capital
5. Trust, security and protection
6. Cross-border trade and cooperation

Each of the areas is the subject of ongoing innovation, investment, research and debate. As such, this document offers a framework, along with actionable recommendations and leading examples, to help deliberately embed private-public collaboration in digital transition strategies that will be in various levels of development depending on a region or country's unique circumstances and stage in their digital journey.

Neither the framework nor the recommendations are intended to be *mutually exclusive and comprehensively exhaustive*. This is not offered as the result of academic research, but as a pragmatic guide for collaborative efforts ongoing across the world. Many of these discussions will take place within a country or other jurisdiction level. While the language throughout reflects this, the principles apply more broadly.

By using this framework as a basis to engage stakeholders from across all industries and sectors, the World Economic Forum and its partners hope to shed light on common priorities, and accelerate collaboration, investment, business innovation and agile policy solutions in specific areas.

To successfully accelerate the digital transition of your country and lead through public-private collaboration, four steps must be prioritized:

1. A comprehensive national (or equivalent) digital economy strategy with clear and ambitious shared goals for society.
2. A standing private-public group of leaders to champion the digital transition across all sectors.
3. An investment gap analysis complete with a multi-year financing strategy including contributions from public and private sectors.
4. A digital skills gap mapping, along with a multi-year strategy for upskilling, reskilling and the future of work.

Through 2023, the World Economic Forum and its government, international organizations and business partners will host a series of roundtables to go deeper on specific geographies or issues. You are invited to join this digital transition journey.

1

Digital and sustainable transformation of industries

COVID-19 catapulted organizations everywhere into the digital first world. Growing access to connectivity and digital services had already been reshaping many industries, business models and supply chains, yet the pandemic further accelerated these digital trends, thrusting organizations of all types to rely more heavily on digital operating and business models to create new value and experiences. Some organizations are progressing towards their digital transformation goals while others are struggling to reach their full potential.

Through the pandemic, the digital transformation gap widened, with some governments and organizations speeding ahead towards their digital transformation goals, while others struggling to survive, let alone thrive.

Without a comprehensive government approach for a digitally equipped economy, including sustainable investment in connectivity infrastructure and services, inequalities widened. A complete and responsible digital transformation of industries requires important considerations of digital infrastructure investments and related policies to enable the digital transition across the entire economy, and in ways that benefit society

as a whole, not just today but for years to come. Some questions that need consideration include: How can emerging technologies such as artificial intelligence (AI), the internet of things (IoT) and supercomputing be leveraged and how can the application of these technologies be encouraged to tackle challenges facing society, economy and the planet?

How can the cloud – private, public, hybrid and at the edge – be leveraged in ways that spur innovation and collaboration, break down data silos, and fully embrace a data-first world, all while respecting data privacy and security?

How can software innovations that help minimize carbon footprints of data be adopted and made prevalent, while incentivizing actions to tackle every inefficiency in data centres?

A government's own digital transformation should be included in a holistic national roadmap developed in collaboration with sectors critical to their economy. Governments should foster a citizen-centric mindset to infuse technology solutions across all sectors of the economy, thereby improving citizen experiences and public services.

Potential value

Governments have an opportunity to advance step changes in technological advancements across industries and within their own operations, through sound policy and investments in digital skills and infrastructure. Research shows that digital transformation can reduce emissions in hard-to-abate sectors by as much as 20% by 2050 ([World Economic Forum, 2022](#)). Moreover, the World Bank estimates that the digital economy is equivalent to 15.5% of global GDP, growing two and a half times faster than global GDP over the past 15 years (World Bank, 2022). Low productivity and scaled back growth, coupled with the inability to fully (and responsibly) benefit from technologies such as cloud, 5G and AI, and high-performance computing will lead to deteriorating quality of essential services and block the transition towards a more advanced economy. Interoperability will be vital to ensure information exchange and enable collaboration.

Action plan

Recommendation 1

Encourage a cross-sector, public-private dialogue on value creation to design new frameworks around sustainable investments in connectivity infrastructure and services

- 1.1.** Assess network capacity requirements to future-proof infrastructure to enable innovations such as edge-computing, autonomous driving, industrial IoT, blockchain, metaverse and other areas at scale
- 1.2.** Foster ecosystem-wide partnerships to develop mutually agreeable value creation to connect vertical industries, and accelerate the understanding and uptake of technologies that leverage data to help tackle climate and other societal issues
- 1.3.** Ensure agile policy frameworks given the ever-evolving innovation that is taking place around current and emerging technologies, which require investment in digital infrastructure

Recommendation 2

Stimulate growth through digitally enabled collaboration models that enable transformation of industries

- 2.1.** Encourage open data standards and platforms to enable insights (rather than data) sharing between companies within and across industries that create better outcomes for customers and citizens
- 2.2.** Incentivize digitally-enabled business models through government policies
- 2.3.** Support SMEs digital transformation efforts across supply and demand factors (e.g. access to affordable financing, connectivity, cloud, AI and highperformance computing platforms)

Recommendation 3

Accelerate the “twinning” of the digital and green transitions to promote sustainability, circularity and fairness

- 3.1.** Design policy frameworks to accelerate digitalization of high greenhouse gas (GHG) emitting sectors and minimize GHG footprint of the digital sector through smart cloud policies underpinned by hybrid cloud strategies
- 3.2.** Support regional, national and local governments with funding and knowledge sharing to promote smart and climate neutral cities
- 3.3.** Create a uniform emission reporting mechanisms and standards toward a circular economy

Leading practices

EU Green and Digital ‘Twin’ Transition (Green Deal)

A holistic solution that places new technologies and innovation at the heart of the pathway towards circular economy transition.

ASEAN Digital Masterplan 2025

A digital action plan enabling governments and regulators to accelerate the growth of digital economy and enable digital society.

Bahrain’s Cloud First Policy

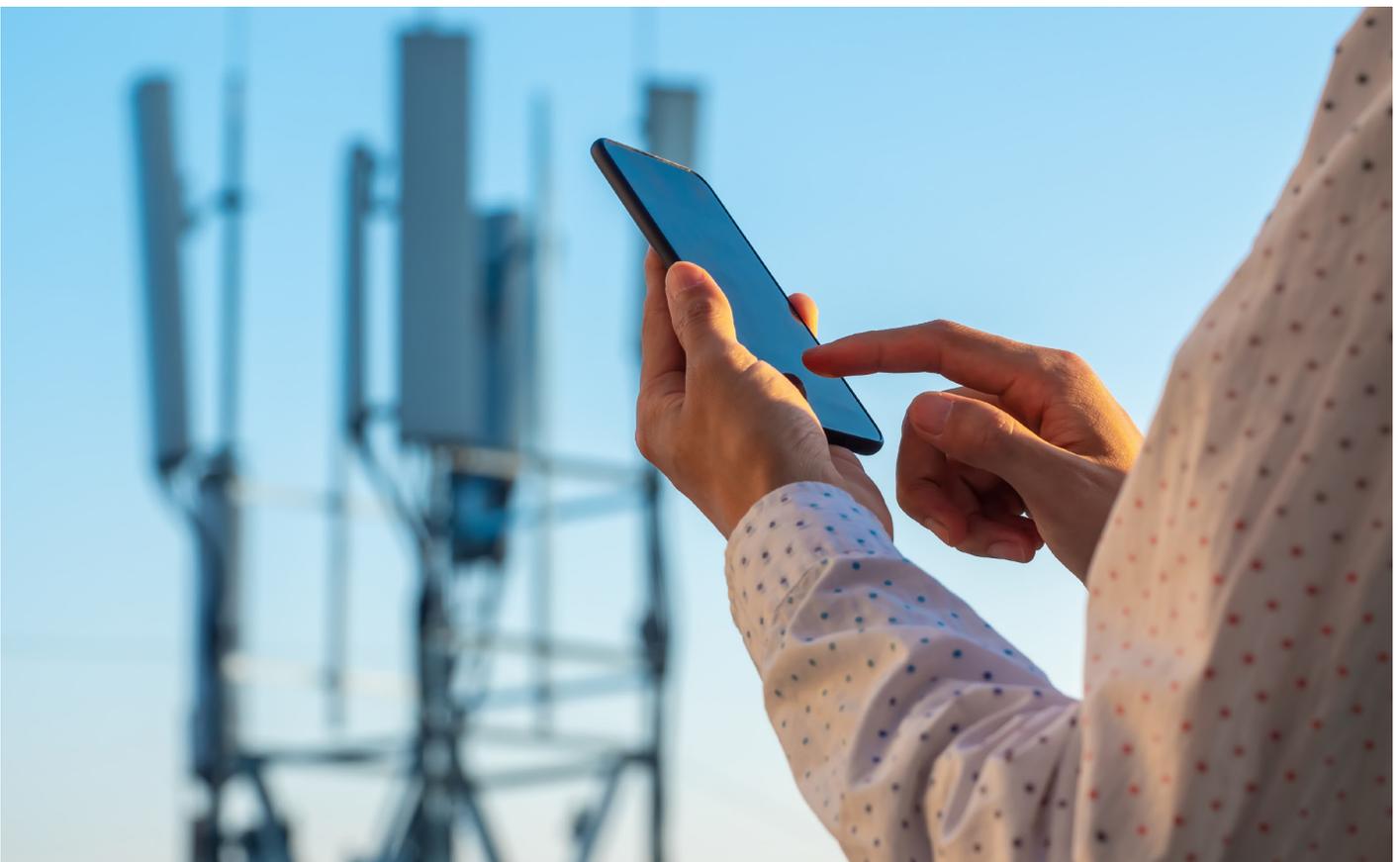
A government-led digital strategy towards a digital-native ecosystem to improve the public’s quality of life through innovation and effective policy implementation.

2

Universal adoption of affordable digital services

Every person should be able to affordably participate in the digital economy. In a fragmented world, technology should be seen as a means of connecting and empowering people and economies, and not as a tool to drive further exclusion. However, more than a third of the world's population remains offline despite 95% within range of some form of connectivity. While challenges will vary in each country, enabling connectivity will require basic infrastructure investment as well as addressing

the affordability and usage gap of digital services. Despite the progress made in the past decade, there is an urgent need for policymakers to address the widening digital divide and implement the right mechanisms to encourage cross-sector, public private dialogues. This can lead to broad value creation through sustainable investment new financing vehicles, and a combination of new and emerging connectivity solutions to enable full participation in the digital economy.



Potential value

To derive new value from emerging technologies, governments need favourable policies and appropriate regulatory standards to drive demand for digital infrastructure and encourage supply among private sector players. An estimated 70% of new value created in the economy over the next decade will be based on digitally enabled platform business models (World Economic Forum, 2022). However, 37% of the world's population remains unconnected to the internet (ITU, 2021). Moreover, it is estimated between \$450 billion and \$2 trillion is needed to reach universal digital inclusion (BCG, 2020; Broadband Commission, 2021). Through public-private partnerships, governments can enable the private sector to become integral to the society it operates in, leading to a comprehensive affordable access to the digital economy.

Action plan

Recommendation 1

Develop holistic national digital strategies in collaboration with industry partners

- 1.1.** Develop a digital transformation roadmap and adopt a digital-first approach to existing and new government services
- 1.2.** Set up horizontal national digital strategies across all sector authorities (e.g. Ministry of Health) to ensure cost efficiencies from scale and enable greater knowledge sharing
- 1.3.** Adopt a citizen-centric and digital-first approach to enhance government services at the national and sub-national level, ensuring systemic feedback from citizens

Recommendation 2

Adopt measures addressing the usage gap and affordability in unserved underserved regions

- 2.1.** Ensure affordability of devices and services through favourable taxation and circular economy principles
- 2.2.** Earmark proceeds from ICT sector participants on initiatives supporting affordability and usage gaps
- 2.3.** Build trust, support the development of relevant content and promote the benefits of digital services for low digital penetration regions

Recommendation 3

Support a combination of existing and emerging technologies to deliver affordable and sustainable connectivity

- 3.1.** Encourage corporates to continue optimizing the right mix of technologies across fixed, wireless, and new non-terrestrial technologies across regions and contexts
- 3.2.** Implement policies that expand infrastructure sharing across physical and digital networks with traditional and non-traditional partners
- 3.3.** Futureproof digital and energy infrastructure through transparent and streamlined permitting systems

Leading practices

Bangladesh's Perspective Plan 2021-2041

A visionary 20-year plan that will pave the way for Bangladesh to become an upper middle-income country by 2031 and a prosperous country by 2041, embedding digital technologies as key enabling solutions for success.

Rwanda's Smart Rwanda 2020 Master Plan

A national ICT strategy, focusing on increased private sector participation in ICT investment and development through public-private partnerships to spur job creation and economic growth.

India's Right of Way Amendments for 5G Roll-Out

Updates made to existing telecom infrastructure policies to streamline permitting and set uniform and transparent fees to accelerate 5G roll-out in the country.

3

Strategic development of new technologies

New and emerging technology innovations, such as advanced robotics, quantum and supercomputing, and AI will completely reshape industries. As such, governments must adopt agile governance structures to frame strategic priorities as a focus for innovation, identify what capabilities need to be built, and foster the right mix of incentives for sustainable public-private investment across the entire innovation ecosystem. While many governments and industries lead the race to develop and scale new technologies, it is imperative that competition yields positive sum benefits to economies, societies and the environment. Governments should prioritize strategic technologies

that will spur economic growth and address national and local challenges. Private-public collaboration can help realize such ambitions and lead to establishing a robust in-country innovation ecosystem that encourages start-up communities, leverages academia and builds stronger links across networks and borders. Taking a mission-oriented and purpose-driven approach to technology innovation depends on greater public-private collaboration and dialogue to solve problems and imagine possibilities that matter to citizens, societies and the planet.



Potential value

Through effective policies, governments can foster sustainable investment, development and adoption of new technologies. Particularly, benefits from government funding in the early stages of testing, piloting and early scaling where headwinds can be strong. Enabling that is greater diversity in innovation – across companies, sectors and geographies – empowering all societies to create new value. At the same time, managing the effects that innovation has on the citizens, such as the evolving ways of working, will help build new skillsets fit for the jobs of the future, leading to higher productivity and greater economic output.

Action plan

Recommendation 1

Provide the right mix of economic incentives for companies undertaking R&D underpinning sustainable technology innovation

- 1.1.** Prioritize critical challenges where technologies can significantly boost a country’s output and competitive edge and lead to sustainable technology innovation
- 1.2.** Provide direct financing and tax incentives for companies adopting and diffusing sustainable technology innovation
- 1.3.** Provide tax reduction to companies adopting Fourth Industrial Revolution innovations with ESG benefits

Recommendation 2

Use mission-oriented R&D to boost public-private collaboration

- 2.1.** Leverage public procurement to drive publicprivate collaboration and lead to more innovative and scalable solutions for the Sustainable Development Goals (SDGs_
- 2.2.** Ensure cross-sector and cross-disciplinary approaches by establishing regional, national, and local hubs and alliances
- 2.3.** Sponsor hackathons and challenges requiring public-private collaboration, including academia, to foster fertilisation of ideas and excitement for new solutions

Recommendation 3

Develop agile technology governance frameworks and mindsets to instil confidence and provide flexibility to stakeholders

- 3.1.** Develop capabilities in the principles and tools of agile governance, including regulatory sandboxes, policy labs, or performance-based regulation
- 3.2.** Expand governance beyond the government, including encouraging ethical standards, model contract clauses, or creating collaborative governance ecosystems
- 3.3.** Collaborate and share learnings across jurisdictions

Leading practices

United States Chips and Science Act

A mission-driven national strategy aiming to strengthen key sectors through targeted R&D investment, focus on science and technology, and talent development.

France’s 5G Acceleration Strategy and Networks of the Future

A national strategy aiming to incentivize 5G and 6G R&D across diverse industry verticals (e.g. new Qualcomm 5G/6G R&D centre in Lannion partnering with local industry ecosystems on industrial drones, IoT, mission critical devices and XR).

United States Frontier Exascale Supercomputer

A breakthrough innovation in high-performance computing and AI made possible by an ongoing public and private partnership between the US Department of Energy, Oak Ridge National Laboratory, HPE and others.

4

Digital skills and human capital

The rapid development of technologies will continue to transform the world of work and international labour markets. Cultivating robust digital skills will be crucial to participate in the digital economy and drive growth. Among the key priorities, most essential is the need for governments decision-makers to understand the value that digital skills can bring to their economy and facilitate an inclusive approach to investing in human capital development. Policymakers should devise long-term strategic plans and incentives to build public awareness and attract private sector partners to share technical expertise and support the government in upskilling and

reskilling its workforce in a way that is resilient and future-proof. Establishing clear roles for the cultivation of upskilling and reskilling across academia, government and industry can play a very important role in assessing the digital skills gap and developing comprehensive strategies for the future of work. Understanding that technology is for everybody and equipping the public with the right tools to promote digital literacy and ingrain responsible AI principles, while training highly skilled data scientists and cybersecurity experts, will help create societies that can collectively respond and adapt to change better.



Potential value

Emerging technologies are not at odds with social and economic growth, but require more advanced digital skills to ensure better inclusion to unlock new value and enhance productivity. In Europe, for example, 90% of jobs require basic digital skills, along with literacy and numeracy skills ([European Commission, 2022](#)). Through effective policies and digitally appropriate educational programmes, governments can pave way for technological progress by putting citizens at the centre of the digital transition and equipping them with the right skillset to drive digital growth. Educational systems and vocational training that are in sync with the emerging dynamics of the labour market will help countries gain economic competitiveness and help the public benefit from the advantages brought by emerging technologies.

Action plan

Recommendation 1

Develop holistic national education systems to ensure inclusive digital and financial literacy for the future of work

- 1.1.** Anticipate the job market demand, collect job market data and adapt curricula to foster digital and financial literacy for education systems
- 1.2.** Encourage hiring labour based upon skills rather than education level to expand opportunity and incentivize reskilling
- 1.3.** Increase efforts to build digital resilience, online safety for children, education programmes for fraud, and provide basic technologies to enable an agile learning environment

Recommendation 2

Incentivize private sector to support governments throughout the upskilling and reskilling journey of the existing workforce

- 2.1.** Re-evaluate strategies to attract and retain talent by assessing remote work opportunities
- 2.2.** Encourage entrepreneurial learning activities through incubators, knowledge sharing hubs and mentoring networks
- 2.3.** Promote internship and apprenticeship training among the private sector, through country-specific programmes – tapping digital natives

Recommendation 3

Co-create innovative teaching methods and key competencies required for the future of work

- 3.1.** Leverage digital technologies to co-develop innovative and evidenced-based teaching methods, including online learning platforms to complement in-person learning when appropriate
- 3.2.** Identify broad skills required for employability and long-term success
- 3.3.** Collaborate with institutes of higher education to bolster graduates with strong data science, responsible AI and cybersecurity skills

Leading practices

ProFuturo, a Telefonica Foundation and La Caixa Foundation partnership

The world's largest digital education programme focusing on technology and use of innovative digital teaching-learning experiences to promote the development of digital skills.

Smart Communities Coalition

A public-private initiative with a vision to transform refugee settlements into digitally-connect communities through technology, innovation and strategic support.

BBVA Microfinance Foundation open and free digital platforms for low-income entrepreneurs

A public-private initiative with a vision to transform refugee settlements into digitally-connect communities through technology, innovation and strategic support.

5

Trust, security and protection

While technological innovations bring many benefits, including new means of deriving economic value, the risks need to be addressed, including new forms of cybercrime, data privacy, and the erosion of digital trust in developed and developing economies alike. To successfully transition to a digital economy, governments should foster public-private collaboration to inform the design of secure, responsible, trusted and culturally relevant digital

technologies. Across these parameters, data policies, protocols and partnerships should be co-shaped with multistakeholders. Public trust is a key component in the digital transformation of the society; therefore, to develop a truly digital identity, governments should implement the right mechanisms to boost public trust and enhance public-private cooperation through effective governance frameworks.



Potential value

With appropriate policies, regulation, trust-based partnerships and cyber resilience approaches, governments can unlock new value and enable a safe environment for digital opportunities to be seized. There is room for governments to partner with the private sector to build a digital ecosystem that is designed securely yet boldly to drive innovation, foster technology adoption, and offer a safe environment for privacy and collaboration in a world that is already moving towards greater fragmentation.

Action plan

Recommendation 1

Adopt an ecosystem-wide collaboration approach to strengthen cyber resilience, disrupt cybercrime, and reduce harms online

- 1.1.** Engage with private sector to identify information, content, risks and online behaviours that need to be prioritized and addressed
- 1.2.** Increase awareness of existing and emerging cyberthreats and privacy breaches, and instil ownership of every organization to develop strong cyber-resilience practices
- 1.3.** Adopt universally recognized standards and promote international cooperation to prevent (to the best extent possible) and respond to cyberthreats effectively and efficiently

Recommendation 2

Assess how digital technologies and platforms are shaping the online information environment without creating unintended consequences

- 2.1.** Seek to prevent harm online through proactive awareness, research and education of citizens
- 2.2.** Protect users by enabling them to report harmful content where there is adequate redress through company channels
- 2.3.** Proactively drive systemic change by encouraging the upfront company to adopt safety principles in the design and within the product development process

Recommendation 3

Cultivate trustworthy data stewardship by building collaborative ecosystems; accelerate adoption of tools that generate insights without exposing underlying raw data

- 3.1.** Create citizen-centric data foundations that allow data rights holders the opportunity to review details regarding the purpose and intended uses from the collecting agency
- 3.2.** Incorporate data empowerment into policy designs to consider values and culturally appropriate norms that balance interest of individuals, and public and private interests
- 3.3.** Design proactive services for data ecosystems and ensure they are ethical, sustainable and human-centric

Leading practices

Cybersecurity Tech Accord	U.K.'s Cyber Security Information Sharing Partnership	EU GDPR
A public commitment of more than 150 private companies to promote a safer online world through greater collaboration.	A joint industry and government digital service enabling organizations to share cyberthreat information in a secure environment and collaborate with the government.	A pan-European approach towards the handling and sharing of personal data through an agile government system equipped to adjust policies as technology evolves.

6

Cross-border trade and cooperation

Technological innovation and digitization have already had a profound impact on global and international trade. Digital trade in services is among the most dynamic sectors in the global economy as evidenced by the role of digital financial payments and cross-border data flows following the pandemic. Still, despite the growing trade of digital products and services, barriers persist that prevent governments from achieving their national digital economy goals. Forms of such barriers include outdated rules and

regulations, new forms of protectionism, and the lack of international collaboration on global digital governance. Governments should collaborate across sectors to level the playing field, explore ways to close the trade finance gap and promote greater interoperability of cross-border data flows. Creating suitable digital trade rules for the digital world, and developing an appropriate ecosystem, which can enable sustainable, equal growth opportunities for all should be seen as a priority on governments' agendas.



Potential value

Investing in digital infrastructure remains one of the central prerequisites to enabling seamless data transmission. Breaking data and digital identity silos are key to enabling consistent data flows powering the digital economy. Through greater alignment on data collection and data-sharing processes, governments can significantly increase the extent to which information can be shared cross-border. In turn, this will help prevent further economic fragmentation and enable access to the global market.

Action plan

Recommendation 1

Develop next generation trade agreements for the digital age

- 1.1. Design and adopt digital-first trade agreements to help local businesses take advantage of the global digital economy
- 1.2. Promote interoperability for data flows policies while ensuring privacy and security
- 1.3. Cooperate with private sector to build responsible digital payments systems and promote financial inclusion as the foundation for digital trade

Recommendation 2

Adopt C4IR technologies (TradeTech) to facilitate domestic resilience, global trade and supply chain

- 2.1. Create an enabling policy environment to harness the benefits of technology, such as adopting UNICTRAL MLETR
- 2.2. Invest in human capital and skills for TradeTech adoption
- 2.3. Foster testing/sandbox environment for new technologies and regulation

Recommendation 3

Identify and address broader issues rising from digital trade

- 3.1. Establish new policy framework and approach on international tax in the digital age, including working with the OECD Inclusive Framework
- 3.2. Facilitate digital trade through an effective and fair customs regime
- 3.3. Invest in both “hardware” (e.g. infrastructure, cloud) and “software” (e.g. laws and regulations, digital skills) to advance digital trade

Leading practices

U.K.-Singapore Digital Economy Agreement

The world’s most innovative international trade agreement, covering the digitized trade in services and goods across the whole economy.

HKMA-BOT-CBUAE-PBC DCI Project Inthanon-LionRock

A digital currency and cross-border payment initiative among the Hong Kong Monetary Authority (HKMA), Bank of Thailand (BOT), Central Bank of the United Arab Emirates (CBUAE) and Digital Currency Institute of the People’s Bank of China (PBC DCI).

USA-EU Trade and Technology Council (TTC)

A forum for the US and EU to coordinate approaches to key global trade, economic and technology issues and deepen transatlantic trade and economic relations.

Conclusion

Technology has proved to become a key enabler to success across all industries, striving to modernize the economy and society, and do so responsibly. However, without regional and global cooperation between governments and businesses, progress towards digital transformation may be at risk. Accelerating the digital transition will require buy-in and support from all stakeholders. The public sector is now in a unique position to drive technology-enabled solutions for the benefit of society, harnessing frontier technologies and innovation to tackle the world's most pressing problems.

To achieve this, a cohesive and concerted effort is required from both the government and the industry to steer progress towards digitally equipped ecosystems that rest on strategic and sustainable investment decisions, smart and agile policies, and public-private collaboration.

This document offers a guiding framework on how public and private sector stakeholders can work together and approach the transition towards a digitally enabled future more effectively. Key takeaways include:

- **Designing and developing comprehensive national digital economy strategies that set out ambitious goals for society.** This will require a whole-of-government approach, taking a holistic view of the critical vectors of development. Investing in digital infrastructure is essential to connecting *everyone* and *everything*, *everywhere*.
- **Encouraging greater collaboration among public and private sector leaders to champion the digital transition across all sectors.** A concerted effort will mean that leaders from both public and private sectors will be willing to collaborate across all digital transition pillars outlined in this framework.
- **Understanding the investment gap and mobilizing capital at scale.** Innovative financing models such as [Digital Inclusion Bonds](#) can provide a valuable source of financing to meet the global challenge of financial and digital inclusion and futureproof for successful digital transformation objectives.
- **Identifying the digital skills gap and developing comprehensive programmes to address skills shortage.** Equipping the talent pipeline of the future with robust digital skills is essential for long-term human capital success. Public-private leaders should co-develop comprehensive upskilling and reskilling strategies for future of work resiliency.

Such renewed focus on public and private collaboration will not only help make economies more resilient, but also enable the global community to create new value and realize the promise of technology.

This guiding framework provides a starting point for critical conversations to be had between the public and private sector. The much-needed dialogue will identify common priorities and steer resources, investment, and innovation towards the most critical areas of development.

Through 2023, the Forum will welcome its government, international organization and business partners to a series of roundtables to identify common priorities for value creation and investment, foster greater collaboration on agile policies solutions, and build a shared agenda for the digital transition.

You are invited to join us on the digital transition journey next year and beyond.

Annex

Please refer to the list below of a collection of existing initiatives supporting each pillar as well as other examples illustrating progress against key recommendations:

Digital and sustainable transformation of industries

- [5G 'Smart Farming' initiative \(Liberty Global, Huawei, Eastern Switzerland University of Applied Sciences, et al.\)](#)
- [Apollo Tele Health Services \(Apollo Hospitals Enterprise, ATHS\)](#)
- [Nava Raipur Smart City \(AVEVA Group, City of Nava Raipur Atal Nagar\)](#)
- [CEO Alliance policy recommendations on emissions trading schemes and carbon pricing \(Ericsson, Iberdrola, Schneider Electric, et al.\)](#)
- [European Green Digital Coalition](#)
- [Digital for Climate Scenarios \(World Economic Forum\)](#)
- [Digital Industries Lighthouse Examples \(World Economic Forum\)](#)
- [Digital Indonesia Roadmap 2021-2024 \(Government of Indonesia\)](#)
- [Digital Economy Framework for Action \(Government of Singapore\)](#)
- [FinTech Regulatory Sandbox Framework \(Government of Bahrain\)](#)
- [Denmark Digital Government Strategy \(Government of Denmark\)](#)
- [USA SEC Proposed Rules to Enhance and Standardized Climate-Related Disclosures for Investors \(Government of the United States of America\)](#)
- [Regulatory Technology for the 21st Century \(World Economic Forum\)](#)
- [Accelerating Digital Transformation for Long Term Growth \(World Economic Forum\)](#)
- [Digital Transformation: Powering the Great Reset \(World Economic Forum\)](#)
- [Harnessing Technology for the Global Goals: A framework for Government Action \(World Economic Forum\)](#)
- [Digital Sprinters: Driving Growth in Emerging Markets \(Google\)](#)
- [The Digital Sprinters: How to Unlock a \\$3.4 trillion opportunity](#)

Universal adoption of affordable digital services

- [Internet Para Todos \(Telefónica, Meta, IDB, CAF\)](#)
- [Digital Spain 2025 \(Government of Spain\)](#)
- [Digital Centres \(Government of Bangladesh\)](#)
- [Social Innovation Challenge \(Government of Bangladesh\)](#)
- [The EDISON Alliance](#)
- [Guidebook to Digital Inclusion Bond Financing \(EDISON Alliance\)](#)
- [The Mobile Economy Report \(GSMA\)](#)
- [Global Connectivity Report 2022 \(ITU\)](#)
- [The State of Broadband 2021 \(Broadband Commission\)](#)
- [Achieving Universal and Meaningful Digital Connectivity: Setting a Baseline and Targets for 2030 \(ITU\)](#)

Strategic development of new technologies

- [Lung Cancer Network Malaysia AI X-ray partnership \(AstraZeneca, Qure.ai\)](#)
- [IBM Quantum Network \(IBM, Goldman Sachs, Capgemini, University of Tokyo, Oak Ridge National Laboratory, et al.\)](#)
- [Global Smart Grids Innovation Hub \(Iberdrola, Provincial Council of Bizkaia, et al.\)](#)
- [Artificial Intelligence for Sustainable Energy Transition \(Iberdrola, University of Granada, Polytechnic University of Madrid, et al.\)](#)
- [Asian Development Bank AI and Digitalization Fund \(Asian Development Bank\)](#)
- [Malaysia Digital Economy Blueprint \(Government of Malaysia\)](#)
- [Vietnam National Strategy for Digital Economy and Digital Society Development \(Government of Vietnam\)](#)
- [Mars Perseverance rover and Ingenuity helicopter \(Qualcomm, NASA Jet Propulsion Labs\)](#)
- [European Alliance for Industrial Data, Edge and Cloud](#)
- [5G Technological Cities \(Government of Spain, Telefonica\)](#)
- [Small Business Innovation Research \(SBIR\) and Small Business Technology Transfer \(STTR\) programs \(Government of the United States of America\)](#)
- [Central Bank Digital Currency: Policymaker Toolkit \(World Economic Forum\)](#)
- [Redesigning Trust: Blockchain Deployment Toolkit \(World Economic Forum\)](#)
- [Global Future Council on Quantum Computing \(World Economic Forum\)](#)

Digital skills and human capital

- [IBM Global Skills partnerships and programs \(IBM, et al.\)](#)
- [Education for Digitalization of Energy \(Iberdrola, European Union, et al.\)](#)
- [Blended Education for All \(Government of Bangladesh, BEFA\)](#)
- [Future of Work Lab \(Government of Bangladesh, NISE\)](#)
- [School Connectivity Management Entity \(Government of Brazil, Anatel\)](#)
- [EqualAI Badge© Program \(EQUAL AI, World Economic Forum\)](#)
- [AcademiaBID – Technology Fluency MOOCS \(IDB\)](#)
- [Reskilling in European industry \(ERT\)](#)
- [FORSATI \(Tamkeen and Microsoft\)](#)
- [Reskilling Revolution \(World Economic Forum\)](#)

Trust, security and protection

- [Charter of Trust \(IBM, Canadian Centre for Cyber Security, German Federal Office for Information Security, et al.\)](#)
- [APEC Cross-border Privacy Rules System \(Asia-Pacific Economic Cooperation\)](#)
- [Indonesia's Personal Data Protection Act \(Government of Indonesia\)](#)
- [AstraZeneca data and AI ethics framework \(AstraZeneca\)](#)
- [Charter of Digital Rights \(Government of Spain\)](#)
- [Ethics of Artificial Intelligence \(UNESCO, Telefonica\)](#)
- [Catena-X Automotive Network \(Government of Germany\)](#)
- [Principles for Board Governance of Cyber Risk \(World Economic Forum\)](#)
- [Data for Common Purpose Initiative \(World Economic Forum\)](#)
- [Facilitation 2.0: Trade and Investment in the Digital Age \(World Economic Forum\)](#)
- [Advancing Digital Safety: A Framework to Align Global Action \(World Economic Forum\)](#)
- [Global Cybersecurity Outlook \(World Economic Forum\)](#)

Cross-border trade and cooperation

- [Vietnam and Singapore's Strategic Digital Partnership \(Government of Vietnam and Government of Singapore\)](#)
- [Singapore's Mutual Recognition Arrangements \(Government of Singapore\)](#)
- [Platforms and Ecosystems: Enabling the Digital Economy \(World Economic Forum\)](#)
- [Advancing Data Flow Governance in the Indo-Pacific: Four Country Analyses and Dialogues \(World Economic Forum\)](#)
- [Digital Trade in Services and Taxation \(World Economic Forum\)](#)
- [Defining and Measuring Payment Interoperability \(World Economic Forum\)](#)
- [Data Collaboration for the Common Good: Enabling Trust and Innovation Through Public-Private Partnerships \(World Economic Forum\)](#)

Contributors

Becca Gould

Senior Vice-President, Public Affairs, American Tower Corporation

Sanjay Aggarwal

Senior Director, Public Affairs, American Tower Corporation

Cindy Hoots

Chief Digital Officer and Chief Information Officer, AstraZeneca

Vinita Sethi

Senior Vice-President and Chief Public Affairs Officer, Apollo Hospitals Enterprises

Sophie Miremadi

Vice-President, Government Affairs, AVEVA Group

Gabriela Eguidazu

Director, Innovation for Inclusive Growth, BBVA Microfinance Foundation

Heather Johnson

Vice-President, Sustainability and Corporate Responsibility, Ericsson

Mikael Bäck

Corporate Officer and Vice-President, Ericsson

Waleed Al-Meraj

Director of Policy, Government of Bahrain

Anir Chowdhury

Policy Advisor, Access to Information (a2i), Government of Bangladesh

Yves Nsabimana Iradukunda

Permanent Secretary, Ministry of Information Communication Technology and Innovation, Government of Rwanda

Ann Ewasechko

Director, Corporate Affairs, Hewlett Packard Enterprise

Yanqing Lin

Vice-President of Government Affairs, Huawei Technologies

Beatriz Crisostomo Merino

Head of Innovation Management, Iberdrola

Austin Imperato

Chief of Staff, Government and Regulatory Affairs, IBM

Manuel Kohnstamm

Senior Vice-President and Chief Corporate Affairs Officer, Liberty Global

Julia Jasinska

Head, International Relations and Trade Policy, Nokia

Wassim Chourbaji

Vice-President, Government Affairs, Europe, Middle East and North Africa, Qualcomm Inc.

Audrey Scozzaro Ferrazzini

Senior Director, Government Affairs, Europe, Qualcomm Inc.

Eric Loeb

Executive Vice-President, Government Affairs, Salesforce

Caroline Garnier Charty

Manager, Strategic Partnerships, Office of the Chief Executive Officer, Schneider Electric

Eduardo Navarro de Carvalho

Chief Corporate Affairs and Sustainability Officer, Telefonica

Tom Riege

Senior Vice-President, Office of the Chief Executive Officer, Telenor

Ami Desai

Chief of Staff to Founder, Chairman and Chief Executive Officer Robert Smith, Vista Equity Partners

World Economic Forum

Jonathan Bahmani

Platform Curator, Digital Economy and New Value Creation

Isabelle Mauro

Head, Information and Communication Technology Industries

Derek O'Halloran

Head, Shaping the Future of Digital Economy and New Value Creation; Member of the Executive Committee

FTI Consulting

Valerija Cymbal

Director, Technology, Media and Telecommunications, FTI Consulting

Charles Palmer

Global Head, Technology, Media and Telecommunications, FTI Consulting



COMMITTED TO
IMPROVING THE STATE
OF THE WORLD

The World Economic Forum, committed to improving the state of the world, is the International Organization for Public-Private Cooperation.

The Forum engages the foremost political, business and other leaders of society to shape global, regional and industry agendas.

World Economic Forum
91–93 route de la Capite
CH-1223 Cologny/Geneva
Switzerland

Tel.: +41 (0) 22 869 1212
Fax: +41 (0) 22 786 2744
contact@weforum.org
www.weforum.org