B20 BRASIL 2024

INCLUSIVE GROWTH FOR A SUSTAINABLE FUTURE

DIGITAL TRANSFORMATION

POLICY PAPER

CNI Brazilian National Confederation of Industry

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DIGITAL TRANSFORMATION

POLICY PAPER

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G20
BRASIL 2024
INCLUSIVE GROWTH FOR
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POLICY PAPER

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FOREWORD BY THE TASK FORCE CHAIR

Among the most notable achievements of humanity, technological solutions stand out for their direct benefits to people's quality of life and life expectancy, such as those that have enabled affordable access to food, health and hygiene, decent housing, and leisure.

Our planet, while signaling the depletion of exploitable resources, is home to a growing population and a significant group of people who lack access to essential resources and a dignified life.

There is no other way to solve this complicated paradigm than by significantly increasing the efficiency of resource use, equalizing opportunities, and eliminating bottlenecks in the development process using new technologies, especially by harnessing the full potential of Digital Transformation.

Often treated as something parallel to the physical world, Digital Transformation is, in fact, an inseparable and fundamental part of the solution to humanity's challenges, such as access to basic infrastructure, decent housing and food.

The Digital Transformation phenomenon is not just about technology itself, it will define our future as a society.

Digital technologies have enabled businesses and society to continue to function even during the pandemic lockdowns, helping businesses survive, vulnerable people access healthcare and children continue to learn.

On the other hand, the pandemic has also exposed and exacerbated digital inequality and the gaps that still exist in digital access.

We have developed this document under the assumption that Digital Transformation must be put at the service of people and in addressing current challenges.

We have defined possible paths and delved into priorities that have generated public policy recommendations that, in our perspective, will stimulate ethical progress and more equitable access to the benefits of technology.

In this document, the result of a collective, collaborative, and diverse effort, we present guidelines for a journey of change in our present, developed by business leaders at the forefront of digital transformation, proposing strategies to ensure an equitable digital transformation.

This document aims to improve the relationship between the productive sector and the G20 governments, making Digital Transformation a lever to raise the well-being of populations.

The physical world and the digital world are the same, where the benefits of new digital technologies are necessary for building an inclusive and sustainable future.

Enjoy your reading

Fernando Cestari de Rizzo
Chair of the B20 Brasil Digital Transformation Task Force
CEO, Tupy

FOREWORDS BY THE TASK FORCE CO-CHAIRS

CO-CHAIRS	FOREWORDS
 **Darío Werthein** Chairman of the Board of Directors, VRIO/ Grupo Werthein	*Technology has profoundly and rapidly transformed the way people live, interact, work, access healthcare, information, culture and education. But digital transformation still does not benefit a large part of the world's population and this digital divide represents an obstacle to the development of full citizenship.* *The Digital Transformation Task Force addresses to G20 governments significant recommendations to include individuals in the center or policy making, using digital transformation as a vector of inclusive growth and well-being for marginalized groups, especially in remote areas. To promote a universal and meaningful connectivity and reap the benefits of the digital economy there is an urgent need to ensure a balanced and modern regulation, encouraging private and public initiatives and efforts focus on this goal.* *In addition, we are proud to recommend direct support measures for the less favored people and to put forward the concept of "Edutainment" to use available means to include children in the education process.*
 **Fábio Coelho** President, Google Brazil	*In Brazil, we are witnessing the transformative power of technology and artificial intelligence (AI) in improving lives and fostering economic growth on a daily basis. We are deeply excited about AI's potential to create a more inclusive and prosperous future. The B20's longstanding dedication to promoting digital transformation aligns seamlessly with this vision, providing a valuable framework for collaboration and progress between governments, private sector and civil society.* *This is the first time the Digital Transformation Task Force in the B20 discussions selected Artificial Intelligence as one of the main pillars of its work. We believe to harness the full potential of AI, countries need investment in AI infrastructure, equipping our workforce with the skills of the future, and democratizing access to AI. By embracing these principles, we will unlock the full potential of AI to drive innovation, create economic opportunities, and address some of the most pressing challenges facing our society, becoming Digital Sprinters.* *By continuing to invest in AI research and development, and by fostering a culture of collaboration and of regulation that promotes innovation, we will be able to ensure that countries and other emerging markets are at the forefront of the global digital transformation. We are confident that this is the way forward to build a world where technology serves as a catalyst for progress and prosperity.*

CO-CHAIRS

FOREWORDS

Fariba Wells
Vice President, Kyndryl

Digital transformation promises unprecedented opportunities to uplift every part of society, from individuals to businesses to governments. But to maximize benefits and mitigate challenges, fostering trust, resilience and equity must be at the heart of progress. With this policy paper, the B20 Digital Transformation Task Force lays out our collective vision and recommendations on important policy issues—including cybersecurity and resilience, responsible adoption of AI, digital skilling—to ensure that we harness the full potential of digital transformation, and that we can work together toward a future that is inclusive, sustainable, and accessible to all.

Kate Purchase
Senior Director, International AI Governance, Microsoft

We are at an important inflection point, where the promise of rapid digital transformation can unlock transformative opportunities for our society, but only if that progress is inclusive and shared globally. The B20 Task Force on Digital Transformation's report tackles the critical issues policymakers and business leaders need to consider in order to fully seize this enormous potential. Whether it's addressing universal connectivity, harmonizing cybersecurity and data protection standards, or strengthening international collaboration on responsible AI development and deployment, the report demonstrates that we have the tools, and the collective will to succeed. It provides a clear path forward on how to build trust in our technologies and our institutions to ensure progress is equally shared.

K Krithivasan
CEO & Managing Director, Tata Consultancy Services

Digital evolution is transforming our society, businesses, and our environment at a fast pace. In this agile world, it is imperative that the shift is inclusive and beneficial to society. B20 Digital Transformation Task Force has emerged as the leading voice in shaping policies which are critical to digital evolution. Each of the pillars—universal connectivity, resilient and trustworthy cyber systems, digital skilling, and preparing our MSME's to accelerate digital readiness—are relevant and significant. We are thrilled to see the task force's commitment to unlock the full potential of the digital economy, fuel innovation, and advance sustainable growth.

Michael Miebach
CEO, Mastercard

To unlock the full power of our digital future, everyone needs to be at the table. That principle must be at the heart of our digital transformation efforts. And for leaders in a digital-by-default world, it's the North Star. But we won't get to where we need to be without addressing key barriers holding us back. With this report, the B20 Task Force on Digital Transformation offers a clear road map for policymakers and business leaders around the world. By increasing digital access and investing in ICT infrastructure, growing people's skills to navigate digital systems, and building trust in vital technologies, we can close the digital divide and create digital ecosystems that are inclusive, resilient, and innovative. Working together, we can realize a better digital future that opens up greater opportunities for everyone.

CO-CHAIRS

FOREWORDS

Pablo R. Fava
CEO, Siemens Brazil

A fair development of societies has been a big challenge for humanity and inequality has accelerated over the last decades. In this context, digital transformation can be both a driver to further increase this gap and a powerful tool for inclusiveness. Therefore, digital transformation is a strategic imperative for nations as a driver for sustainable value creation, for economic progress, and for social development and inclusion. Boosting efficiency and sustainability of industries, improving critical infrastructure and public service delivery while propelling innovation, all of them foster new job opportunities and the need for talents qualification. In this paper we bring into focus the topics of cybersecurity and GenAI as, respectively, the main challenge and the major disruptive potential of digital transformation. We are proud of the outcomes of our task force, as our contribution to rethink and build equality and safety for future generations.

Rodrigo Dienstmann
President, LATAM South
Ericsson Group

For nearly 150 years, Ericsson has been a key player in the evolution of telecommunications, from the early days of telephony to the development of 5G networks. Our aim is to work on practical proposals to drive significant change and create a more inclusive and sustainable digital future for the planet.

More than a third of the global population still lacks access to the Internet, despite the rapid digitalization of society. This portion of the planet is cut off from the digital potential of education, healthcare, financial services, and government services.

There is still much to be done, and we need a digital transformation program that not only spreads high-performance infrastructure and networks, but also addresses the economic barriers preventing access to digital services for underserved populations. We believe that partnership between governments and the private sector is essential for this.

Together, we can pave the way for the next leap in digitalization and innovation, ensuring that no one is left behind.

Rebecca Enonchong
Founder & CEO, AppsTech

As digital technologies reshape our world, it is vital that this transformation benefits everyone. The B20 Task Force on Digital Transformation's policy paper offers a pathway to inclusivity, resilience, and trust, addressing issues like connectivity, digital skills, cybersecurity, and responsible AI. Innovation is universal and can emerge from anywhere—not just adapting solutions from more advanced countries but also leveraging the potential of the developing world. We must focus on making internet connections available, reliable, and affordable to foster equity, ensuring technology serves all. Let's shape the technology we aspire to together.

RECOMMENDATIONS: EXECUTIVE SUMMARY

Executive Summary

Recommendation 1: Achieve meaningful connectivity for all individuals and businesses through modern regulations and public-private partnerships that enable the rollout of affordable, resilient ICT infrastructure and address usage gaps across regions.

- **Policy Action 1.1:** Accelerate the roll-out and use of ICT infrastructure by promoting regulatory modernization and public-private partnerships that encourage investment, collaboration, and fair competition, such as licensing models that favor commitments to infrastructure expansion, optimized universal service funds (USFs), and demand-side support initiatives (e.g., government-funded connectivity for essential services).
- **Policy Action 1.2:** Address digital skills gaps across levels and demographic groups to promote the development of a digitally-literate population and digital-ready workforces and entrepreneurs capable of leveraging digital technology with trust, supporting the transformation of businesses, and adapting to technological disruptions.
- **Policy Action 1.3:** Promote the digital transformation of Micro, Small, and Medium Enterprises (MSMEs) through access to sustainable finance, a supportive regulatory environment, and specialized support.

Recommendation 2: Safeguard individuals and organizations and promote digital trust while enabling innovation and development by harmonizing cybersecurity and data protection standards, coordinating international cyber action, and advocating for Data Free Flow with Trust.

- **Policy Action 2.1:** Foster multilateral cooperation to improve international cyber action—from incident prevention, identification, and containment to investigation and legal action—leveraging harmonized cybersecurity and cyber resilience standards.
- **Policy Action 2.2:** Make progress on Data Free Flow with Trust by building on prior consensus while tailoring the approach to the G20 members to enable innovation, economic growth, and social well-being while building trust on a global scale.

Recommendation 3: Responsibly harness the transformative power of artificial intelligence by supporting its development and adoption while collaborating to achieve a shared ambition and common principles for ethics, sustainability, security, and inclusion.

- **Policy Action 3.1:** Strengthen international collaboration and scale up frameworks grounded on a risk-based, pro-innovation approach for responsible AI development, deployment, and governance to keep pace with the rapidly evolving technology and regulatory landscape.

INTRODUCTION

Introduction

Digital Transformation: Driving economic development, promoting social inclusion, and fighting global challenges

The world is experiencing a period of intense technological development. New advancements are emerging at an ever-increasing pace, pervading every aspect of society, and pushing the limits of what is possible. Digital technology has fundamentally changed how people live, work, and interact with each other and with their environment, and this trend is on track to accelerate in the coming years. Approximately 67 percent of the world's population, or 5.4 billion people, is now online compared to 35 percent in 2013[1], and the total market value of frontier technology—from artificial intelligence (AI) and IoT to nanotechnology and biofuels—is expected to grow sixfold, from USD 1.5 trillion in 2020 to USD 9.5 trillion in 2030[2].

Despite the rapid pace of technological disruption, it has yet to effectively integrate a large portion of the global population to address critical real-world issues. Universal access to essential resources and services is far from being achieved, and progress toward achieving United Nations' Sustainable Development Goals (SDGs) is insufficient or negative in 85 percent of targets. Currently, 735 million people face chronic hunger[3] and nearly 60 percent of the global population is not covered by essential health services[4]. Additionally, if current global trends continue, 300 million students will lack basic numeracy and literacy skills, and the world will exceed a 1.5°C global warming by 2035[5].

In this context, digital technology is a tool for addressing these pressing global issues. Agriculture technology and digital platforms, for instance, help address chronic hunger and improve conditions for smallholder farmers by increasing food production, reducing waste in the supply chain, and connecting producers and consumers; telemedicine services improve access to healthcare by enabling remote consultations and diagnostics; online learning platforms bridge educational gaps by providing quality education to students in underserved areas as well as enabling workforce upskilling and reskilling; renewable energy technologies and IoT-enabled smart grids reduce carbon emissions and help mitigate the impacts of climate change. Digital transformation is not the end goal, but the set of tools that will facilitate the advancement of human well-being.

Digital Inclusion: The first step to meaningful transformation for people and businesses

Without universal connectivity, marginalized populations cannot fully benefit from tech development, and despite significant progress in recent years, 2.6 billion people, or 33 percent of the global population, are still offline. Barriers to connectivity are not limited to broadband coverage, as factors such as affordability, ability, and digital trust also contribute to what is known as the "usage gap."

1 INTERNATIONAL TELECOMMUNICATIONS UNION - ITU. **Measuring digital development**: facts and figures 2023. Available at: https://www.itu.int/en/ITU-D/Statistics/Pages/facts/default.aspx. Accessed in: 28 aug. 2024.

2 UN TRADE AND DEVELOPMENT - UNCTAD. **Technology and innovation report 2023**. Available at: https://unctad.org/tir2023. Accessed in: 28 aug. 2024.

3 UNITED NATIONS. **The sustainable development goals report 2023**: special edition. 2023. Available at: https://unstats.un.org/sdgs/report/2023/. Accessed in: 28 aug. 2024.

4 WORLD HEALTH ORGANIZATION – WHO; THE WORLD BANK. **Tracking universal health coverage**: 2023 global monitoring report. 2023. Available at: https://www.who.int/publications/i/item/9789240080379. Accessed in: 28 aug. 2024.

5 UNITED NATIONS. **The sustainable development goals report 2023**: special edition. 2023. Available at: https://unstats.un.org/sdgs/report/2023/. Accessed in: 28 aug. 2024.

The panorama of the digital divide is heterogeneous. Connectivity gaps exist not only among countries—with as much as 73 percent of the population offline in the Least Developed Countries[6] — but also within countries. The urban-rural divides, age disparities, and gender gaps are all examples requiring targeted action.

Moreover, digital gaps are not exclusive to individuals, as businesses in certain segments also commonly lag in the adoption of digital technology depending on factors such as size, industry, and location. In this context, barriers to the digitalization of Micro, Small, and Medium Enterprises (MSMEs) stand out as a key challenge to address.

Despite playing a major role in the global economy and labor market, accounting for over 90 percent of businesses and more than 50 percent of employment worldwide[7], MSMEs typically lag in the adoption of digital technology compared to their larger competitors. This causes them to miss out on relevant opportunities, such as greater participation in regional, national, or global marketplaces, and greater access to the capital and credit needed to grow[8] (7).

Digital Trust: Balancing security and innovation in a digital world

In recent years, cybersecurity and trust have become an important concern for individuals, businesses, and governments around the world and are now considered prerequisites for a successful digital transformation. While the adoption of technology and increasing reliance on interconnected networks have brought about unparalleled opportunities for growth and innovation, they have also heightened the risk of cyber incidents causing financial, operational, and reputational damage to organizations and individuals.

From a business standpoint, cybersecurity refers to the protection of digital resources, including sensitive data, intellectual property, and critical infrastructure, from cyber incidents. In this context, cybersecurity measures focus on the continuity of organizations' operations, the protection of their customers' data, and the preservation of their reputation, as opposed to broader national security concerns such as cyberterrorism.

Cyber incidents are not restricted to malicious attacks, as accidental incidents are also possible. Nevertheless, the financial damage of cyberattacks is already substantial. Estimates reveal that global cybercrime is predicted to cost a total of USD 9.5 trillion in 2024 and USD 10.5 trillion by 2025. If it were measured as a country, cybercrime would be the world's third largest economy after the United States and China[9] (8).

These and other privacy-related concerns are leading to an increase in national regulations that constrain data flow and increase data localization requirements— in the period of 2009 to 2019, the number of data regulations worldwide nearly doubled[10] (9). While these regulations aim to protect privacy and security, they often have unintended consequences. The current patchwork of conflicting rules creates a complex and fragmented landscape that stifles innovation. Businesses face challenges such as overlapping regulations, unclear definitions, and high compliance costs that not only hinder the development of new technologies but also prevent the widespread adoption of existing ones, creating a siloed digital economy.

6 INTERNATIONAL TELECOMMUNICATIONS UNION - ITU. **Global connectivity report 2022**. 2022. Available at: https://www.itu.int/hub/publication/d-ind-global-01-2022/. Accessed in: 28 aug. 2024.

7 THE WORLD BANK. **Small and Medium Enterprises (SMEs) Finance, Improving SMEs' access to finance and finding innovative solutions to unlock sources of capital**. 2019. Available at: https://www.worldbank.org/en/topic/smefinance. Accessed in: 28 aug. 2024.

8 BROADBAND COMMISSION FOR SUSTAINABLE DEVELOPMENT. **Making digital connectivity work for MSMEs**. 2023. Available at: https://www.broadbandcommission.org/publication/making-connectivity-work-for-msmes/. Accessed in: 28 aug. 2024.

9 CYBERSECURITY VENTURES. **2023 Official Cybercrime Report**. 2023.

10 **OECD**. Fostering cross-border data flows with trust. 2022.

The AI Imperative: Global collaboration for responsible innovation

As nations turn to technology to tackle global challenges, simply deploying existing tools will not suffice. Innovation will be the driving force, and artificial intelligence (AI) stands out as a particularly promising solution. The speed of adoption and implementation of AI is unparalleled to any other technological advancement—as demonstrated by the global funding of generative AI solutions, which soared from under USD 50 million in 2014 to over USD 10 billion in 2023[11] (10)—and as it evolves at an unprecedented pace, it promises to revolutionize societies and economies with its ability to increase productivity and drive innovation.

However, unlocking AI's benefits requires responsible consideration of its implications. The rise of AI has brought forth novel and complex concerns regarding responsibility, ethics, safety, security, and sustainability, posing a significant challenge that requires collaborative action by nations and organizations.

Global mobilization toward ensuring the responsible development and adoption of AI has already begun—the Organisation for Economic Co-operation and Development (OECD) AI Principles and the United Nations' resolution on AI are a few examples of recent international efforts.

A call to action for the public and private sectors

As the public sector spearheads national and international efforts to solve global challenges, it can—and should—leverage the private sector's expertise and scale. Businesses possess the agility, technical know-how, innovation capabilities, and track record of developing solutions that can be scaled and adapted to different contexts.

Representing the global business community, the B20 Brasil Digital Transformation Task Force reaffirms its commitment to this collaborative effort, and shares through this policy paper three recommendations—each building on the prior—on how the G20 members can promote inclusive and meaningful digital transformation:

- Achieve meaningful connectivity for all individuals and businesses through modern regulations and public-private partnerships that enable the rollout of affordable, resilient ICT infrastructure and address usage gaps across regions.
- Safeguard individuals and organizations and promote digital trust while enabling innovation and development by harmonizing cybersecurity and data protection standards, coordinating international cyber action, and advocating for Data Free Flow with Trust.
- Responsibly harness the transformative power of artificial intelligence by supporting its development and adoption while collaborating to achieve a shared ambition and common principles for ethics, sustainability, security, and inclusion.

11 **CB Insights.**

RECOMMENDATION 1

Recommendation 1

Recommendation is aligned with previous B20 editions

Achieve meaningful connectivity for all individuals and businesses through modern regulations and public-private partnerships that enable the rollout of affordable, resilient ICT infrastructure and address usage gaps across regions.

Policy Actions

Policy Action 1.1 – Accelerate the roll-out and use of ICT infrastructure by promoting regulatory modernization and public-private partnerships that encourage investment, collaboration, and fair competition, such as licensing models that favor commitments to infrastructure expansion, optimized universal service funds (USFs), and demand-side support initiatives (e.g., government-funded connectivity for essential services).

Policy Action 1.2 – Address digital skills gaps across levels and demographic groups to promote the development of a digitally-literate population and digital-ready workforces and entrepreneurs capable of leveraging digital technology with trust, supporting the transformation of businesses, and adapting to technological disruptions.

Policy Action 1.3 – Promote the digital transformation of Micro, Small, and Medium Enterprises (MSMEs) through access to sustainable finance, a supportive regulatory environment, and specialized support.

Key Performance Indicators	Baseline	Target	Classification
Percentage of individuals using the Internet[12] Proportion of individuals who used the internet from any location in the last three months *Source: International Telecommunication Union (ITU)*	**67%** (2022)	**85%** (2027)	Aligned with previous B20s editions
Percentage of individuals with basic, intermediate, and advanced digital skills *Source: International Telecommunication Union (ITU)*	Basic: **45%** Interm.: **31%** Advanced: **6%** (2023)	Basic: **55%** Interm.: **40%** Advanced: **10%** (2027)	Aligned with previous B20s editions
Percentage of MSMEs using enterprise technology platforms Share of small and medium businesses[13] purchasing cloud computing services[14] *Source: OECD*	**50%** (2023)	**90%** (2027)	New indicator

12 For targeted action, KPI can be analyzed by its two components: coverage and use. In 2022, the coverage and usage gaps represented 5 and 28 percent, respectively.

13 From 10 to 249 persons employed.

14 The adoption of cloud technology alone does not guarantee effective use of enterprise technology platforms, but it signifies an effort toward digitalization. For future editions, we recommend that G20 countries discuss measures to more accurately track MSMEs' progress toward an effective digitalization.

SDGs

Recommendation 1 contributes to the achievement of the following UN SDGs:

SDG 4: quality education, SDG 5: gender equality, SDG 8: decent work and economic growth, SDG 9: industry innovation and infrastructure, SDG 10: reduced inequalities, and SDG 17: partnership for the goals. The remaining SDGs may be positively impacted as digital technology empowers solutions across various sectors.

More details in Annex A

Relevant B20 Brasil Guiding Claims

Recommendation 1 has the strongest impact on three B20 Brasil Guiding Claims:

Increase productivity through innovation

Enhance human capital

Foster the resilience of Global Value Chains

More details in Annex B

Relevant G20 Brasil Priorities

Recommendation 1 contributes to the priorities of the G20 Brasil **Digital Economy Working Group** and **Research and Innovation Working Group**

More details in Annex C

Context

Digital inclusion of individuals

Digital inclusion serves as the foundation for digital transformation. Without universal connectivity—encompassing not only broadband coverage, but also other key enablers such as affordability and digital literacy—marginalized populations cannot fully benefit from tech development. Recognizing

digital connectivity as a fundamental element of its 2030 Agenda for Sustainable Development, the United Nations has set targets for universal and meaningful connectivity to be achieved by 2030.

Global connectivity has been rising over the last decades. The percentage of the global population using the Internet increased from 35 percent to 67 percent between the years 2013 and 2023, representing a growth from 2.6 billion people in 2013 to 5.4 billion people in 2023[15].

However, while digital technologies shape the future of society, increasingly permeating daily lives and blurring the line between the physical and the digital world, the connectivity landscape remains heterogeneous. In 2023, 2.6 billion people, 33 percent of the global population, were still offline—largely concentrated in developing areas. In Least Developed Countries (LDCs), for instance, as much as 73 percent of the population were offline[16].

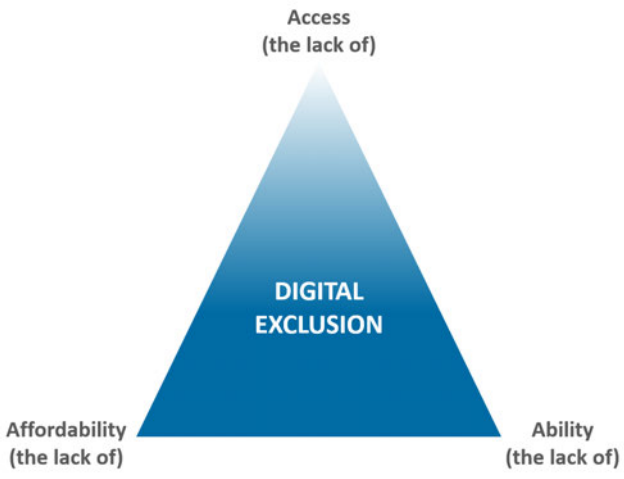
While the lack of digital connectivity disproportionately harms all individuals who are excluded, it presents an especially critical challenge in strategic locations such as schools and hospitals, which play an essential role in providing basic resources and directly impact communities' well-being.

The United Nations outlines three key barriers to connectivity (Exhibit 1)[17]:

- **Lack of access** to essential ICT (Information and Communications Technology) infrastructure and digital resources, such as electricity, Internet and mobile infrastructure, e-information, and e-services
- **Lack of affordability** of Internet access, digital devices, and e-services
- **Lack of ability** to effectively use and know the benefits of digital technology

These barriers are often interconnected. Access and affordability depend heavily on the level of development of the ICT infrastructure in each region, and remote areas often suffer from both limited access and low affordability. Additionally, these are closely linked to digital literacy, as digital skills are not put into practice when individuals are digitally excluded or do not understand the benefits of connectivity.

Exhibit 1 | The intersectionality of barriers of access, affordability, and ability in determining digital exclusion



Source: United Nations, E-Government Survey 2022

15 INTERNATIONAL TELECOMMUNICATIONS UNION - ITU. **Measuring digital development**: facts and figures 2023. Available at: https://www.itu.int/en/ITU-D/Statistics/Pages/facts/default.aspx. Accessed in: 28 aug. 2024.

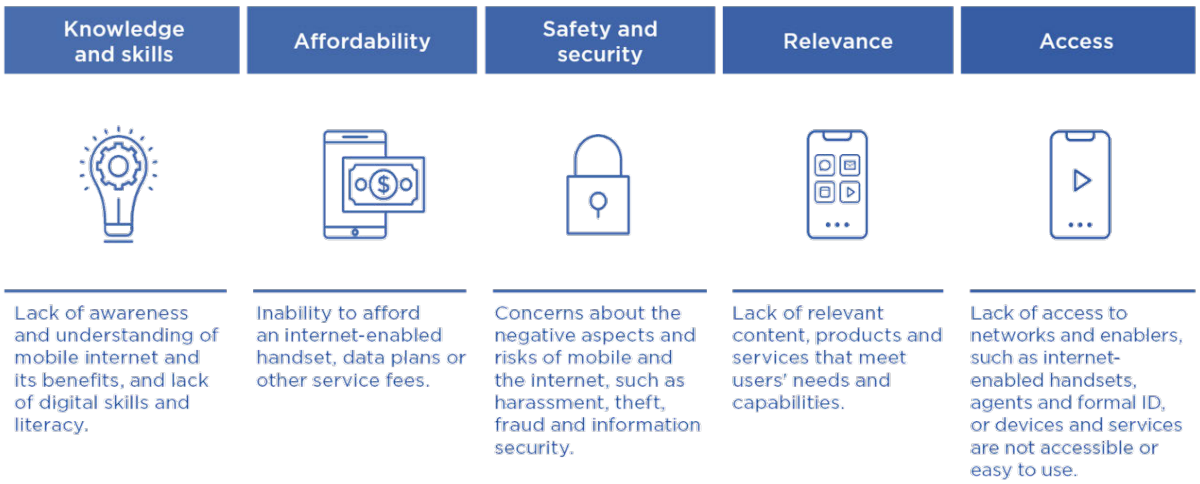
16 INTERNATIONAL TELECOMMUNICATIONS UNION - ITU. **Global connectivity report 2022**. 2022. Available at: https://www.itu.int/hub/publication/d-ind-global-01-2022/. Accessed in: 28 aug. 2024.

17 UNITED NATIONS. **E-Government Survey**: 2022 The Future of Digital Government. 2022.

With a focus on mobile broadband, the GSMA highlights two additional barriers to adoption and use (Exhibit 2).

- **Lack of safety and security**, in digital economy and tools
- **Lack of relevant content**, products, and services that meet users' needs and capabilities[18]

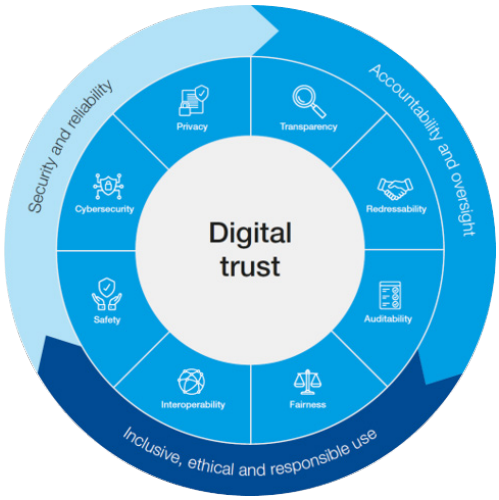
Exhibit 2 | Barriers to mobile Internet adoption and use



Source: GSMA

The term "digital trust" is often used to represent the broader picture of safety and security. It extends beyond just safeguarding users and requires, for instance, individuals and organizations believing they are safe in the digital world and committed to using digital technology ethically and responsibly. This encompasses fostering a sense of security from online scams, misinformation, and manipulation. The World Economic Forum (WEF) defines digital trust "as individuals' expectation that digital technologies and services – and the organizations providing them – will protect all stakeholders' interests and uphold societal expectations and values"[19] and places it at the center of a framework with three goals and eight dimensions (Exhibit 3).

Exhibit 3 | Digital trust framework



Source: World Economic Forum

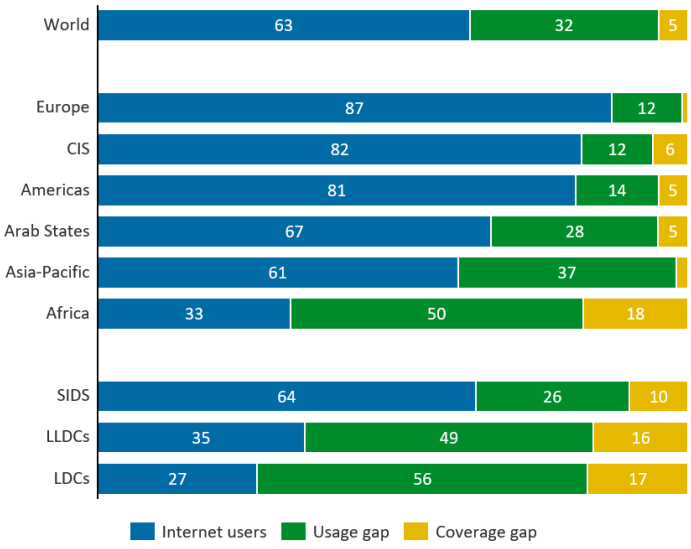
18 GSMA. **The State of Mobile Internet Connectivity Report 2023**. 2023.

19 WORLD ECONOMIC FORUM. **Earning Digital Trust**: Decision-Making for Trustworthy Technologies. 2022.

On a regional level, data from the International Telecommunication Union (ITU) shows that Africa is the least connected region, with 67 percent of the population offline (i.e., not using the Internet due any or a combination of the previously mentioned barriers), followed by Asia-Pacific, with 39 percent of the population offline, and Arab States, with 34 percent of the population offline. On the other end of the spectrum, Europe, the CIS, and the Americas boast over 80 percent of connectivity (Exhibit 4)[20].

Exhibit 4 | Coverage and usage gap

Percentage of the population using the Internet, not using the Internet, and not coveredby a network, 2021



Note: The coverage gap is the percentage of the population that does not have access to a mobile or fixed network. The usage gap is the percentage of the population not using the Internet minus the coverage gap. Values equal to or less than three are not labeled due to space considerations. CIS = Commonwealth of Independent States.
Source: International Telecommunication Union (ITU)

To ensure a more comprehensive understanding of the existing disparities, connectivity can be analyzed through its two components: the availability of digital infrastructure (coverage) and the extent to which people utilize it (usage).

Broadband coverage has seen significant progress over the last years, reaching 95 percent worldwide in 2023—for comparison, electricity network deployment is at 91 percent worldwide[21]. Nevertheless, there are significant differences in terms of technology. More developed regions, such as Europe, CIS, Asia-Pacific, and the Americas, boast over 86 percent of households served by fixed networks, while developing countries rely almost exclusively on mobile broadband. In African counties, for instance, only 7 percent of households are served by fixed networks[22].

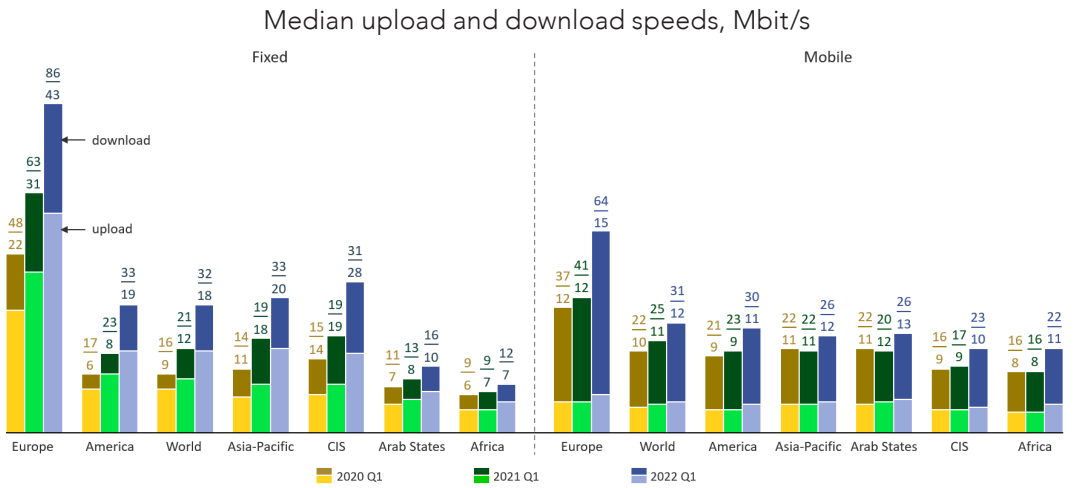
Regarding usage, 32 percent of people worldwide—56 percent of people in LDCs—are not using the Internet despite being covered by a mobile or fixed network. This can be attributed to factors such as:

- **High prices:** Significant progress has been made in terms of service and device affordability in recent years. Globally, average mobile data prices reached a record low of 1.5 percent of gross national income (GNI) per capita in 2022, and the number of countries meeting the Broadband Commission for Sustainable Development's entry-level affordability target rose from 96 to 103 between 2021 and 2022. Nevertheless, there is still a barrier to overcome. Eighty-five countries still have not met this target, and in many countries that have, prices remain unaffordable for the poorest 40 per cent of the population[23].

20 INTERNATIONAL TELECOMMUNICATIONS UNION - ITU. **Global Connectivity Report 2022**. 2022.
21 UNITED NATIONS. **The Sustainable Development Goals Report 2023**: Special Edition. 2023.
22 INTERNATIONAL TELECOMMUNICATIONS UNION (ITU). **Global Connectivity Report 2022**. 2022.
23 INTERNATIONAL TELECOMMUNICATIONS UNION (ITU). **The affordability of ICT services 2022**. 2022.

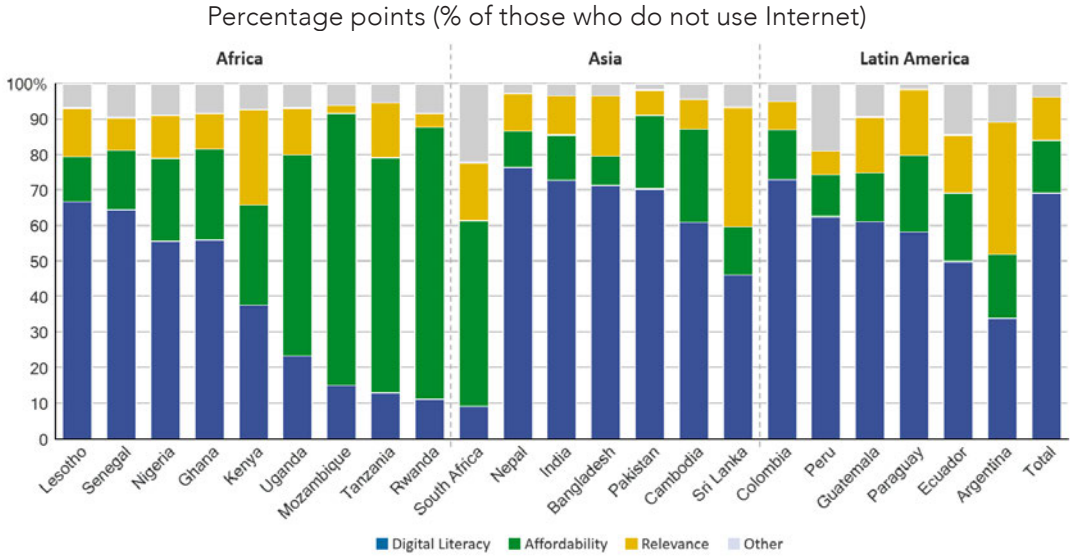
- **Poor quality of connection:** Poor quality impacts access to online services and can lead to lower usage among populations covered by fixed or mobile infrastructure. Data collected by Ookla reveals that broadband speed, an indicator of quality, varies substantially by region and type of connection. Median upload and download speeds are up to seven times lower in developing regions when compared to Europe (Exhibit 5)[24].
- **Limited digital literacy:** A study conducted by the World Bank about mobile Internet adoption in the global south showed that lack of digital literacy was the main reason for not using the Internet (Exhibit 6)[25].

Exhibit 5 | Upload and download speeds



Notes: The data are collected via the Speedtest by Ookla applications for Android and iOS. "Mobile" refers to tests taken from mobile devices and a cellular connection type, e.g., 3G, 4G LTE, 5G NR. "Fixed" refers to tests taken from mobile devices and a noncellular connection type, e.g., Wi-Fi, Ethernet. The data in the figure reflect the median value of the countries' average speeds within each region. CIS = Commonwealth of Independent States.
Source: International Telecommunication Union (ITU)

Exhibit 6 | Main reason for not using the Internet across the population as a whole



Note: The digital literacy category includes "do not know what Internet is" and "do not know how to use Internet"; affordability includes "no access device" and "too expensive"; the relevance category includes "no interest/not useful" and "no relevant content in local language." Individual weights are applied in the calculation.
Source: Rong, Chen; World Bank Group

24 INTERNATIONAL TELECOMMUNICATIONS UNION (ITU). **Global Connectivity Report 2022**. 2022.

25 CHEN, Rong-DECIG; WORLD BANK GROUP. **World Development Report 2021**: A Demand-Side View of Mobile Internet Adoption in the Global South. 2021.

The panorama of the digital divide is vast, and it does not depend exclusively on the level of development of countries and demographic groups. Variables such as location, gender, and age also play a role in connectivity[26] (1):

- **The urban-rural divide:** In 2023, connectivity in rural areas was 50 percent worldwide, 31 percentage points lower than connectivity in urban areas (81 percent worldwide)[27] (1)
- **The age divide:** In 2023, the share of youth, aged between 15 and 24, using the Internet was 14 percentage points higher than the rest of the population (79 versus 65 percent)[28] (1)
- **The gender divide:** In 2023, while most high-income countries had reached gender parity (0.99 gender parity score), that was not the case for low-income countries (0.59 gender parity score)[29] (1). Women are also 15% less likely than men to use mobile internet in low- and middle-income countries[30] (16).
- **The disability divide:** In 2023, 16 percent of the global population lived with disabilities[31] (17). Yet, while there is little information on Internet access among this group, data suggests that there is a significant gap in smartphone ownership[32,33] (5) (18).

As private and public services move online, digitally excluded people are placed in a situation of even greater disadvantage. Their participation in society becomes further compromised and they are deprived of the growth potential offered by the digital economy.

Digital transformation of businesses

Digital gaps are not exclusive to individuals, as the acceleration of digital technologies is having a profound impact on the business landscape as well. Three categories of business are currently in greater disadvantage:

- Micro, small and medium-sized enterprises (MSMEs), with more limited scale and resources, often encounter difficulties in embracing digital technology.
- Traditional businesses that operate in segments that are increasingly disrupted by the digital economy may have their competitive capacity hindered due to regulatory asymmetries that subject traditional companies to more strict requirements and obligations compared to new entrants.
- Companies located outside major centers or areas with affordable infrastructure face challenges in adopting digital technology.

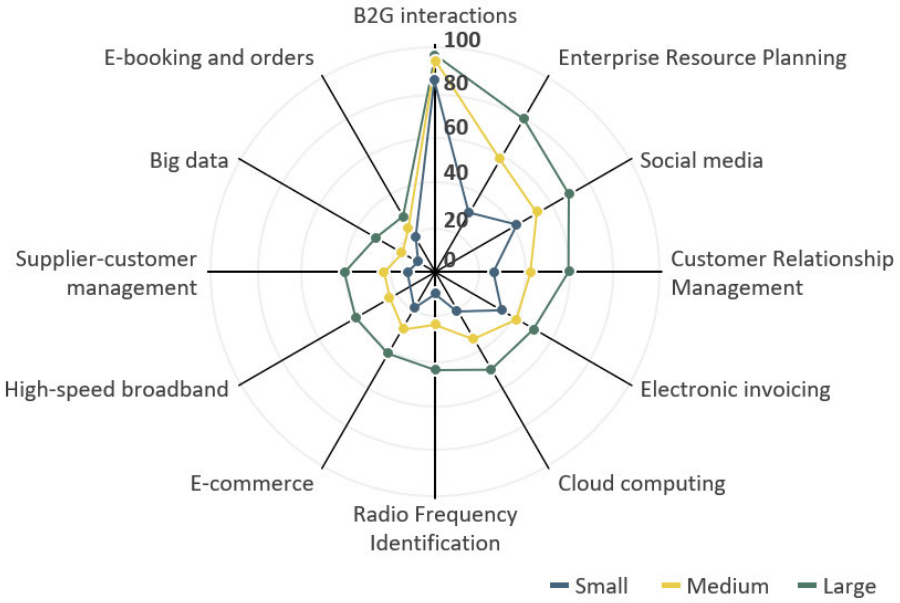
Diving deeper into the first group: MSMEs are the backbone of most economies. SMEs represent about 90 percent of businesses and more than 50 percent of employment worldwide, and formal SMEs contribute up to 40 percent of GDP in emerging economies. These numbers are significantly higher when informal SMEs and micro-sized enterprises are included[34].

26 INTERNATIONAL TELECOMMUNICATIONS UNION (ITU). **Measuring digital development**: Facts and Figures 2023. 2023.
27 INTERNATIONAL TELECOMMUNICATIONS UNION (ITU). **Measuring digital development**: Facts and Figures 2023. 2023.
28 INTERNATIONAL TELECOMMUNICATIONS UNION (ITU). **Measuring digital development**: Facts and Figures 2023. 2023.
29 INTERNATIONAL TELECOMMUNICATIONS UNION (ITU). **Measuring digital development**: Facts and Figures 2023. 2023.
30 GSMA. **The Mobile Gender Gap Report 2024**. 2024.
31 WORLD HEALTH ORGANIZATION (WHO). **Disability**. 2023.
32 INTERNATIONAL TELECOMMUNICATIONS UNION (ITU). **Global Connectivity Report 2022**. 2022.
33 GSMA. **Consumer Survey**. 2020.
34 THE WORLD BANK. **Small and Medium Enterprises (SMEs) Finance, Improving SMEs' access to finance and finding innovative solutions to unlock sources of capital**. 2019.

Yet, despite their importance to the global economy and labor market, MSMEs typically lag in adoption of digital technology compared to their larger competitors (Exhibit 7)[35]. This lag causes them to miss out on relevant opportunities, such as greater participation in regional, national, or global marketplaces—selling goods or services to existing customers more efficiently, or to new customers they could otherwise not reach—easier payments, and greater access to the capital and credit needed to grow[36].

Exhibit 7 | SME gap in digital adoption exists across technologies

Diffusion rate (Median OECD, based on country average percentages of enterprises using the technology over 2015–18)



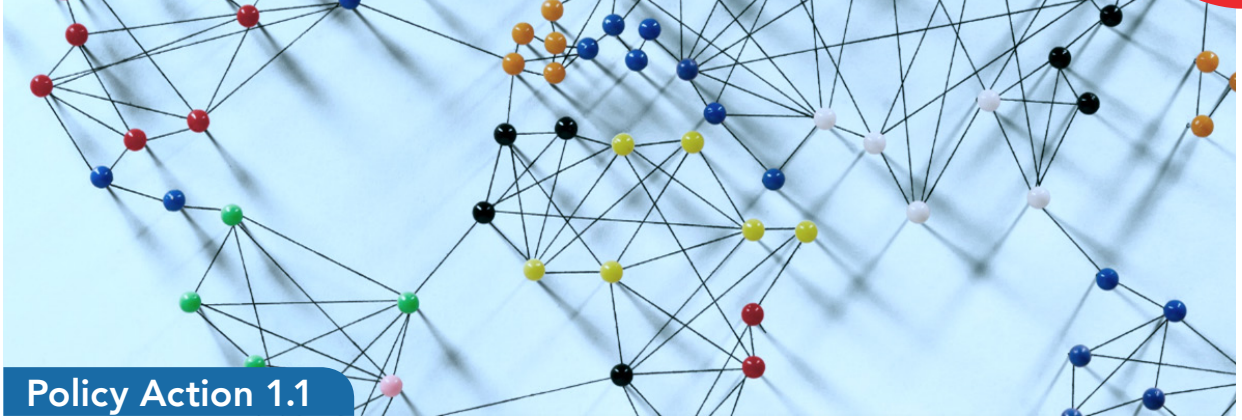
Source: OECD, The Digital Transformation of SMEs

Challenges that MSMEs face in their journey to digitalization include[37,38,39,40]:

- Limited access to high-quality and affordable digital infrastructure
- Lack of digital culture and skills, and difficulty to attract digital talent
- Insufficient capital and financing solutions to fund the transformation
- Lack of information and awareness about the available resources and their benefits
- Limited security resources and trust in the digital economy

In conclusion, digital connectivity has transcended mere communication to become the bedrock of progress. It empowers individuals with knowledge and opportunity, while businesses leverage it to innovate and reach new markets. As society moves forward, ensuring equitable access and responsible use of this tool will be paramount in unlocking an inclusive future and ensuring everyone can benefit from the opportunities offered by the digital landscape.

35 OECD. **The Digital Transformation of SMEs**. 2021.
36 BROADBAND COMMISSION FOR SUSTAINABLE DEVELOPMENT. **Making Digital Connectivity Work for MSMEs**. 2023.
37 BROADBAND COMMISSION FOR SUSTAINABLE DEVELOPMENT. **Making Digital Connectivity Work for MSMEs**. 2023.
38 OECD. **The Digital Transformation of SMEs**. 2021.
39 OECD. **SME digitalisation to "Build Back Better"**. 2021.
40 INTERNATIONAL TRADE CENTRE (ITC). **SME Competitiveness Outlook 2022**: Connected Services, Competitive Businesses. 2022.



Policy Action 1.1

Accelerate the roll-out and use of ICT infrastructure by promoting regulatory modernization and public-private partnerships that encourage investment, collaboration, and fair competition, such as licensing models that favor commitments to infrastructure expansion, optimized universal service funds (USFs), and demand-side support initiatives (e.g., government-funded connectivity for essential services).

Executive Summary

To achieve this goal, the G20 should:

- Ease infrastructure deployment by simplifying permitting processes, expediting spectrum availability, setting global standards, and ensuring a modern, lightweight regulatory touch for the ICT sector, aligned with evolving technologies, sector specificities, and free competition.
- Maximize value for society, businesses, and government by promoting license granting models that prioritize infrastructure expansion over solely financial bids, enabling operators to commit to reinforcing infrastructure in underserved areas in exchange for licenses.
- Address service and device affordability gaps through demand-side support initiatives, such as government-funded connectivity for essential services, in line with each country's context.
- Recalibrate universal service funds (USFs) to address connectivity barriers on both the demand and supply sides and effectively meet the needs of the underserved.
- Promote public-private partnerships to provide connectivity in currently underserved strategic locations, such as schools, libraries, public service facilities, and security and health institutions.

Background and Context

Connectivity is the foundation upon which the digital world is built. Yet, for many, this foundation remains incomplete. When it comes to ICT infrastructure, bridging the digital divide requires not only expanding coverage to bring essential online resources and opportunities to currently excluded populations, but also making it modern and affordable to enable the widespread adoption of established and emerging technologies.

Providing affordable access is the first step toward empowering marginalized communities by granting them access to resources such as online educational platforms, telemedicine consultations, and basic financial and e-government services. This not only equips them with the knowledge and tools for self-improvement, but also fosters innovation and economic opportunities, ultimately paving the way for a more equitable and prosperous future.

The G20 should ease infrastructure deployment by simplifying permitting processes, expediting spectrum availability, setting global standards, and ensuring a modern, lightweight regulatory touch for the ICT sector, aligned with evolving technologies, sector specificities, and free competition

> Aligned with previous years' call to foster private investment by removing deployment barriers, ensuring fair competition, and promoting global standards for the ICT sector.

In order to bridge the ICT infrastructure gap, the G20 should focus on the effective implementation of National Broadband Plans (NBPs), continuous roll out of fixed and mobile broadband, and promote competition and investment in emerging technologies. This should be accompanied by an overall improvement in the investment climate, removal of deployment barriers (e.g., long permitting processes, over taxation), a positive regulatory environment, and global standards.

First, deployment barriers, such as lengthy permitting processes, delayed spectrum availability, and high spectrum prices should be addressed so society can more quickly benefit from the benefits of connectivity. Government intervention should be targeted, focused on addressing market failures and the needs of underserved communities, all while respecting technology neutrality, encouraging private sector investment, and avoiding disruption of competition dynamics.

Second, regulatory asymmetries should be fixed to enable companies to compete on a level playing field—while traditional "pay-TV" and over-the-top (OTT) subsectors, for example, have converged into the same market, regulatory burdens remain unequal in many countries. Phasing out subsector-specific taxes and moving to more broad-based taxes can help eliminate those regulatory asymmetries while benefiting governments in the long-term by expanding the user and tax base.

Last, international collaboration on global standards should be supported. In mobile telecommunications, for instance, the 3GPP standard ensures a single phone can be used anywhere in the world. ICT standards help expand coverage to unconnected regions, reduce market conflicts, enable cost reduction across all links of the value chain, and create a level playing field where digital solutions can be deployed globally with ease.

The G20 should maximize value for society, businesses, and government by promoting license granting models that prioritize infrastructure expansion over solely financial bids, enabling operators to commit to reinforcing infrastructure in underserved areas in exchange for licenses

Traditional license auction models, which primarily reward the highest financial bid, often fail to incentivize infrastructure development in remote areas. This arises because the combination of lower population density, typically lower purchasing power, and high deployment and maintenance costs makes these areas less profitable and often renders the business model unsustainable.

As telecommunication operators struggle to justify the required investments to expand coverage to remote areas, they tend to concentrate their efforts on more densely populated urban areas, leaving remote and rural areas with limited or no access to essential communication services, exacerbating the digital divide, and hindering the overall development of these communities.

Alternative auction models have been developed to address this challenge. These models shift the focus from financial bids to infrastructure reinforcement commitments, ultimately maximizing value for society, businesses, and government. A good example for developing economies is Brazil's recent multiband 5G auction, which considered operators' commitment to the expansion of 5G and 4G networks, deployment of fiber-optic backhaul, and investment in public school connectivity (Box 1.1).

Box 1.1: Brazil's 5G auction model

A study by the GSMA highlights some mechanisms that allowed Brazil's 2021 5G spectrum licensing process to successfully strike a balance between government objectives, operators' requirements, and consumer welfare, such as:

- **Deduction of obligation costs from reserve prices**, making licenses more attractive by reducing the starting bid price (reserve price) by the amount the winner will need to spend on fulfilling certain obligations, such as coverage targets in remote areas
- **New payment terms with yearly installments for the license duration**, spreading out the cost of the license over the entire license period
- **Longer license terms**, a **secondary spectrum market**, and **unlimited renewal terms**, introduced in 2019 through an updated telecommunication law
- **Overall alignment with national objectives**, such as motorway coverage, protection of adjacent services, 4G availability in remote areas, and a set timeline for 5G implementation, making the model appealing not only for society and businesses but also for the government

Six commitments made by the winners outline the expected outcomes over a 10-year period:

- Provide 5G coverage to all 5,570 Brazilian municipal seats by July 2029
- Provide 5G coverage to 1,700 nonmunicipal locations by December 2030
- Provide 4G or higher technology coverage to 7,430 locations by December 2025
- Provide 4G coverage to 2,349 highway stretches, totaling 35,784 km by December 2029
- Deploy fiber-optic backhaul in 530 municipal seats by December 2026
- Invest BRL 3.1 billion in public school connectivity (deadline to be defined)

Source: GSMA (2021) Brazil multi-band auction: one of the largest in mobile history, gov.br

The G20 should address service and device affordability gaps through demand-side support initiatives, such as government-funded connectivity for essential services, in line with each country's context

Affordability is a critical factor contributing to the usage gap and it extends beyond the cost of Internet broadband and digital services, as the cost of devices themselves also play a significant role. To tackle this challenge, the G20 can further explore modern demand-side support initiatives that would stimulate digital adoption by making services and devices more accessible, particularly for underprivileged demographic groups (Box 1.2).

While demand support mechanisms come in various forms (e.g., direct subsidies, vouchers, cash-back programs) and address various needs (e.g., connectivity, device acquisition, service access), a key strategy to consider is government-funded connectivity for essential services. While the definition of "essential service" may vary among countries depending on their context and the needs of their population, it typically includes government education, healthcare, employment, and citizenship resources.

The G20 members should explore policies to promote demand-side support initiatives and support them by designating a managing body to oversee programs, selecting eligible services, establishing supporting systems and technologies, and creating monitoring mechanisms to assess the realized economic and social impacts.

Box 1.2: Peru's *Internet para Todos*

Peru's *Internet para Todos* (IPT) or "Internet for All" began its operations in 2019 as a private initiative supported by the public sector and development banks in the region. With the goal of connecting the six million unconnected people in Peru, stakeholders collaborated to address the operational, financial, and regulatory challenges involved in deploying ICT infrastructure in rural areas.

In 2023, just over three years after its launch, IPT had connected 3.6 million people in over 18,000 areas without Internet coverage in Peru, which required deploying over 2,300 4G antennas.

Source: GSMA, Telefónica Perú, Mobile Time

The G20 should recalibrate universal service funds (USFs) to address connectivity barriers on both the demand and supply sides and effectively meet the needs of the underserved

> Aligned with previous years' call for the optimization and modernization of Universal Service Funds by scaling existing and proven technologies and business models.

Universal service funds (USFs) are government-administered funds collected to promote availability and affordability of essential ICT services to all citizens. USFs are typically raised through contributions from operators and used to subsidize the cost of infrastructure deployment and service provision in areas where it may not be economically viable for private companies to operate (Box 1.3).

Although USFs play an important role in promoting universal connectivity, studies suggest that some are underused or used inefficiently. Challenges include suboptimal design, inefficient governance and coordination, unclear or unmeasurable objectives, and unfair resource allocation processes[41,42]. A study by the WEF suggests that "universal service funds might be better utilized if focused on high-risk populations and to reduce gaps among vulnerable groups including women and girls, persons with disabilities, and older persons, regardless of where they live"[43].

The G20 should assess the effectiveness of their member countries' USFs and modernize the underperforming ones by scaling proven technologies and business models, setting clear objectives, providing a sound governance structure, and ensuring the necessary supporting regulations.

Box 1.3: USFs in developing counties

- **Kenya's Universal Service Fund** was established in 2009 to support widespread access to ICT services and promote capacity building and innovation in ICT services in the country. With its Voice Infrastructure Project, Education Broadband Connectivity Project, E-Resources Centers, and Open Education Resources, the fund finances national projects that have significant impact on the availability and accessibility of ICTs in rural, remote, and poor urban areas.[1]
- **Ghana's Investment Fund for Electronic Communications** currently focuses on expanding coverage of mobile telephone services, equipping citizens with ICT skills and providing full-service connectivity to designated locations through its three main programs: Rural Connectivity, ICT Capacity Building, and Cyberlabs.[2]
- **Costa Rica's National Telecommunications Fund (Fonatel)** is collaborating with the private sector to provide connectivity in Tortuguero National Park. Leveraging new connectivity technology, such as solar-powered radio site solutions, the initiative has managed to provide free high-speed Internet access to over 15 schools and 4,000 low-income families.[3]

Source: (1) Communications Authority of Kenya (2) Ghana's Investment Fund for Electronic Communications, ITU Academy (3) dpl news

The G20 should promote public-private partnerships to provide connectivity in currently underserved strategic locations, such as schools, libraries, public service facilities, and security and health institutions

> Aligned with B20 India's call for innovative solutions to strengthen network deployment and connectivity in areas with poor connectivity.

While there are ongoing efforts to increase affordable Internet infrastructure coverage, such as expanding fixed and mobile broadband, targeted initiatives can expedite bringing connectivity

41 INTERNATIONAL TELECOMMUNICATIONS UNION (ITU). **Global Connectivity Report 2022**. 2022.

42 GSMA. **Universal Service Fund Study**. 2013.

43 INTERNATIONAL TELECOMMUNICATIONS UNION (ITU). **Global Connectivity Report 2022**. 2022.

to strategic locations, such as schools, libraries, public service facilities, and security and health institutions (Box 1.4).

Innovations in connectivity infrastructure through public-private partnerships can help overcome the economic challenges of providing connectivity to the unconnected at scale, as evidenced by successful examples already in place. One such example is the use of satellite technology to provide Internet connectivity and access to e-learning platforms in rural schools, empowering students and teachers in these areas to engage with a wider range of educational resources, ultimately improving learning outcomes. In such partnerships, governments typically provide the regulatory framework and resources like infrastructure or subsidies, while private companies bring their expertise in technology, innovation, and efficient service delivery.

Box 1.4: Ghana's Cyberlabs

The Cyberlabs program represents the most comprehensive and extensive component of Ghana Investment Fund for Telecommunications' approach to ICT development. The program aims to facilitate efforts and support full-service Internet connectivity, services, and facilities to designated un(der)served communities, institutions, and schools in Ghana, delivering broadband access that is available to all potential users within each service area.

The program currently encompasses three main projects:

- The **School Connectivity Project** involves the provision of high-speed computers, printers, scanners, projectors, and servers to educational institutions, to facilitate the use of ICT in teaching and learning, and ICT Capacity Building. Through this initiative, over 900 schools have been equipped.
- The **Community ICT Centers (CICs)** project involves the establishment of CICs within designated locations to provide community-wide access to full-service Information and Communication Technology (ICT), at publicly available locations. These centers also function as Training Centers for GIFEC's Capacity Building Program. Over 250 CICs have been established, with 120 being fully functional.
- The **Institutional Support** project involves the provision of ICT equipment to public sector institutions. Through this initiative, over 50 institutions have been equipped.

Source: GIFEC

Policy Action 1.2

Address digital skills gaps across levels and demographic groups to promote the development of a digitally-literate population and digital-ready workforces and entrepreneurs capable of leveraging digital technology with trust, supporting the transformation of businesses, and adapting to technological disruptions.

Executive Summary

To achieve this goal, the G20 should:

- Promote global collaboration in mapping digital competences, adopting a shared competence framework, establishing unified standards and metrics for digital literacy, developing mutually recognizable certification programs, and assessing individuals' proficiency level.
- Update educational programs and curricula to support the development of digital skills at schools and universities.
- Provide digital literacy training to individuals beyond the school setting to ensure widespread essential digital skills, focusing on addressing gender, generational, and other proficiency gaps.
- Define accessibility standards and rules to ensure effective use of digital products and services by persons with disabilities.
- Promote training and continuous education to enable the upskilling and reskilling of workforce and entrepreneurs.
- Encourage the development of digital learning resources to extend the reach of affordable and high-quality STEM (Science, Technology, Engineering and Mathematics) training programs to underserved parts of the world to help them integrate the global workforce.

Background and Context

Ability is crucial for achieving digital inclusion, as access and affordability are insufficient without the basic skills required to utilize digital technology effectively. Moreover, the emergence of new technologies, such as AI, and the intensification of digital trends, such as the continuous rise in cyberattacks, requires the development of specific skills across various levels to prepare and protect users and workforce from digital disruptions.

Digital skills encompass various proficiency levels, ranging from elementary to expert, across diverse areas, such as social media, data analytics, and coding, all of which are crucial for technological development. The following recommendations primarily focus on the digital skills that have the greatest impact on enabling a safe and inclusive digital transformation: basic digital literacy across demographic groups, upskilling of entrepreneurs and workforce, and reskilling of displaced workforce.

The G20 should promote global collaboration in mapping digital competences, adopting a shared competence framework, establishing unified standards and metrics for digital literacy, developing mutually recognizable certification programs, and assessing individuals' proficiency level

> Aligned with B20 Italy and B20 Indonesia's call to map digital competences and establish shared taxonomy and frameworks. Also mentioned in B20 India, but as part of a broader mandate of a new proposed international body

The rapid pace of technological change has disrupted the traditional skills landscape. Citizens and workers must now continuously adapt by learning new digital tools and skills to stay relevant. In this era of swiftly changing skill requirements, it is essential to establish a better alignment around a common language for skills.

The WEF highlights the benefits of adopting shared taxonomies, standards, and frameworks for skills assessment and tracking[44,45] (23) (24):

- Better assessment of skill levels and gaps to support reskilling and upskilling decisions
- More effective delivery of training, with better alignment of learning content to talent needs
- Better understanding of job transition pathways
- Improved recruiting practices, with more effective identification of the right talent and reduced bias
- More efficient communication and greater collaboration between talent, learning providers, employers, and governments

The G20 members should promote the adoption of globally shared frameworks and standards for assessing and tracking current levels of digital competence across industries and sectors, as well as a common digital skills taxonomy. These must be dynamic, customizable, and granular to adapt to the rapidly changing technology landscape, talent needs, and industry specificities.

To achieve this, the G20 should build upon existing initiatives and frameworks, such as the WEF's Global Taxonomy, the Occupational Information Network (O*NET) Taxonomy, and the ESCO (European Skills, Competences, and Occupations) framework.

Once this foundation is laid, G20 members should collaborate to develop mutually recognized certification programs, allowing individuals to demonstrate their digital skills across borders. This standardization will enable efficient assessment of populations' proficiency levels, providing valuable data for targeted interventions. By streamlining the measurement and recognition of digital literacy, G20 members can optimize resource allocation across digital skills development programs.

The G20 should update educational programs and curricula to support the development of digital skills at schools and universities

> Aligned with B20 Italy and B20 Indonesia's call to reform education curricula to include key digital skills. Also mentioned in B20 India, but as part of a broader mandate of a new proposed international body.

As digital technology undergoes rapid evolution and permeates deeper into personal and professional spheres, equipping students with the necessary skills to navigate this digital landscape becomes key. To achieve this, educational curricula must be continuously updated to foster effective and safe use of digital tools, ensuring all students become literate citizens in the digital age.

44 WORLD ECONOMIC FORUM. **Building a Common Language for Skills at Work**: A Global Taxonomy. 2021.

45 WORLD ECONOMIC FORUM. **Putting Skills First**: A Framework for Action. 2023.

Educational programs should not only focus on developing core digital skills but also equip students with critical understanding of the opportunities and potential risks associated with emerging technologies such as artificial intelligence. Additionally, curricula should include cybersecurity competences, such as awareness of online threats, data privacy practices, and safe online behavior, to empower students to safely use digital technology.

The G20 members should prepare students for the digital age by ensuring that education curricula are reviewed and updated. They should be mindful that these curricula should be tailored to the specific needs of each country and student and be accompanied by the teaching of soft and cognitive skills. For optimal results, close collaboration between education institutions and the corporate sector should be encouraged to ensure that educational curricula are aligned with business needs and employment prospects.

The G20 should provide digital literacy training to individuals beyond the school setting to ensure widespread essential digital skills, focusing on addressing gender, generational, and other proficiency gaps

> Aligned with previous years' call for the development of essential digital skills among more vulnerable groups.

Updating educational programs and curricula is a crucial step for developing digital skills within the formal education system. However, equipping those beyond the school setting is equally important. Targeted training can bridge digital proficiency gaps across demographic groups, including the previously illustrated gender and generational divides.

The G20 members should promote digital literacy training beyond formal education by effectively leveraging physical and digital resources to provide targeted training to individuals of all ages and backgrounds. To support this effort, the G20 can draw inspiration from existing initiatives (Box 1.5).

Box 1.5: Targeted digital literacy initiatives

- The **Rwandan government's Digital Ambassador Program (DAP)** was launched in 2017 with the goal of training 5,000 youth as "Digital Ambassadors" and sending them across the country to provide digital skills training to five million citizens. By the end of the Proof-of-Concept phase (2017–2019), the program had reached nearly 50,000 people.
- **EQUALS**, a partnership between **ITU and UN Women**, is working for equal access and use of digital technologies for women by 2030. Initiatives include the #eSkills4Girls Fund, which provides financial resources to gender-sensitive initiatives, and Her Digital Skills, focused on designing and providing free, foundational digital skills training.

Source: ITU, UN

The G20 should define accessibility standards and rules to ensure effective use of digital products and services by persons with disabilities

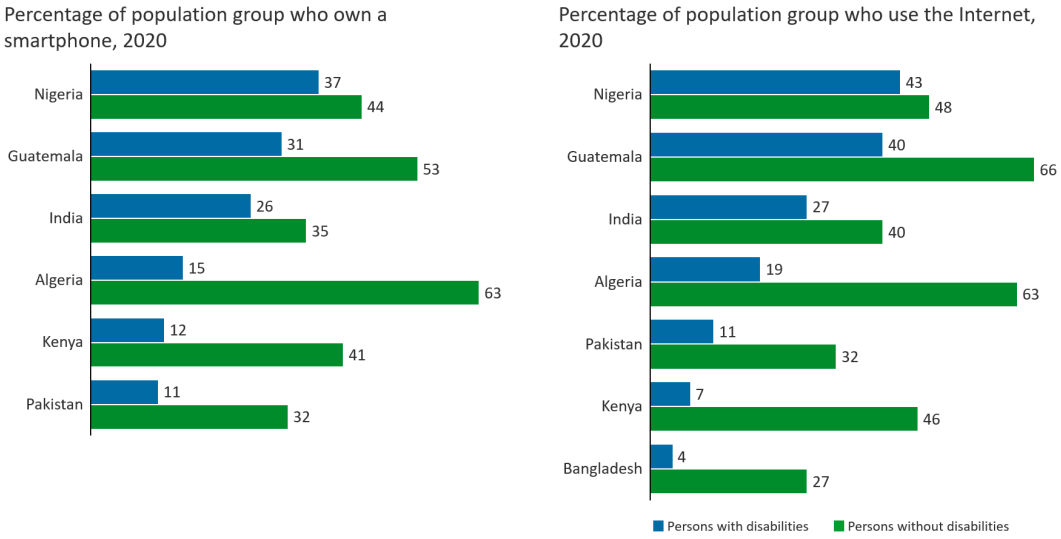
The World Health Organization estimates that, in 2023, 1.3 billion people—or 16 percent of the global population—lived with significant disabilities; a number that is expected to continue growing due to an increase in noncommunicable diseases and life expectancy[46].

While there are currently no global statistics on Internet access among people with disabilities, data collected by the GSMA on smartphone ownership and Internet use in some middle-income countries

46 WORLD HEALTH ORGANIZATION (WHO). **Disability**. 2023.

reveals significant gaps between people with disabilities and the general population (Exhibit 8). In Algeria, for instance, the Internet use gap exceeds 40 percentage points[47,48].

Exhibit 8 | Disability gap for smartphone ownership and mobile Internet use



Note: Based on survey results for adults aged 18 and over. n=49-260 for persons with disabilities and n=900-1 866 for persons without disability.
Source: GSMA Consumer Survey 2020.

Acknowledging the difficulties people with disabilities encounter when using digital technology, public and private organizations are actively pursuing initiatives to guarantee global accessibility of digital products (Box 1.6).

The G20 members should promote the collection of disaggregated statistics on connectivity among persons with disabilities to better understand the specific challenges faced by this population and act to bridge connectivity gaps. Initiatives may include setting accessibility standards and norms for applications, websites, and devices, providing targeted training, and encouraging the development of digital solutions that specifically address their needs (e.g., scanning applications empowering persons with visual impairments).

Box 1.6: Accessibility initiatives

- As part of its **Digital India** initiative, the government of India is implementing the Accessible India Campaign with the goal of enabling people with disabilities to have access to equal opportunities, live independently, and participate fully in all aspects of life in an inclusive society. Through this program, 588 state government and 95 central government websites have become accessible for persons with disabilities.
- Legislation in several countries, such as the **United States**, the **United Kingdom**, and **Canada**, require public and/or private organizations to comply with accessibility standards in their information and communication technology that help ensure products and services are easier to use for persons with disabilities.
- **Device manufacturers** have also adapted their products to be more accessible to persons with disabilities through features such as enabling larger fonts and screen readers. Resources such as the W3C global standard for web accessibility and the GSME Principles for Driving Digital Inclusion of Persons with Disabilities offer guidelines to support this effort.

Source: (1) UN E-gov Survey (2) ITU Global Connectivity Report (3) ITU Global Connectivity Report; W3C; GSMA

The G20 should promote training and continuous education to enable the upskilling and reskilling of workforce and entrepreneurs

47 INTERNATIONAL TELECOMMUNICATION UNION (ITU). **Global Connectivity Report 2022**. 2022.
48 GSMA. **Consumer Survey**. 2020.

Aligned with B20 Italy and B20 Indonesia's call to promote up/re-skilling through continuous education. Also mentioned in B20 India, but as part of a broader mandate of a new proposed international body.

As technology advances, creates new opportunities, and transforms traditional job roles, it becomes imperative for the workforce to adapt by engaging in lifelong learning and continuous skills development. The rapid advancement of technologies such as artificial intelligence and automation is transforming industries, leading to the creation of new job opportunities while rendering some existing roles obsolete. By upskilling and reskilling, the workforce can not only remain relevant and competitive but also contribute to the overall economic growth and innovation in their respective industries.

Continuous learning is also paramount for entrepreneurs. Digital tools and platforms have become foundational for business success, and the digital economy has created opportunities for entrepreneurs—small sellers, for instance, rely heavily on e-commerce to reach their customers. By acquiring digital skills, entrepreneurs can not only adapt their ventures to this new landscape but also drive innovation.

The G20 members should establish national strategies for developing digital competencies to address domestic and international skills gaps and prepare the workforce and entrepreneurs for technological disruptions. Development plans should not only include skills in emerging areas such as artificial intelligence, but also build the necessary foundation in areas such as cybersecurity. Additionally, these plans should accommodate diverse learning styles and career paths, fostering both generalists and specialists.

The G20 should encourage the development of digital learning resources to extend the reach of affordable and high-quality STEM (Science, Technology, Engineering and Mathematics) training programs to underserved parts of the world to help them integrate the global workforce

A robust foundation in STEM fields is crucial for nations' technological advancement and economic growth. Nevertheless, many individuals in underserved regions around the world still lack access to quality STEM education, hindering their potential to contribute to the global workforce.

Digital learning resources offer a powerful solution to bridge this gap. By developing online platforms and interactive tools, G20 members can deliver affordable and high-quality training programs to students, regardless of geographical limitations. This democratization of knowledge empowers individuals with the skills and qualifications needed to actively participate in the globalized economy.

More information on how nations can leverage digital technology to expand the reach of STEM education can be found in the Employment & Education Task Force's Policy Paper

Policy Action 1.3

Promote the digital transformation of Micro, Small, and Medium Enterprises (MSMEs) through access to sustainable finance, a supportive regulatory environment, and specialized support.

Executive Summary

To achieve this goal, the G20 should:

- Expand efforts to offer sustainable financing to accelerate MSME adoption of digital technologies (e.g., flexible collateral options, tools for better corporate accounting).
- Leverage digital technologies to enhance financial inclusion of MSMEs.
- Support the development of local organizations that assist MSMEs with resources during their digital transformation journey, and improve the collection, analysis, and availability of MSME data for more effective public and private action.
- Promote a favorable regulatory environment and e-government services to alleviate the administrative burden for MSMEs.

Background and Context

The digital landscape is increasingly important for business success, yet many MSMEs are falling behind larger competitors in adopting digital technologies. This digital divide creates an uneven playing field that hinders their growth. To ensure a thriving and competitive business environment for increased innovation and economic growth, it is imperative to bridge this gap and empower MSMEs with digital tools and resources.

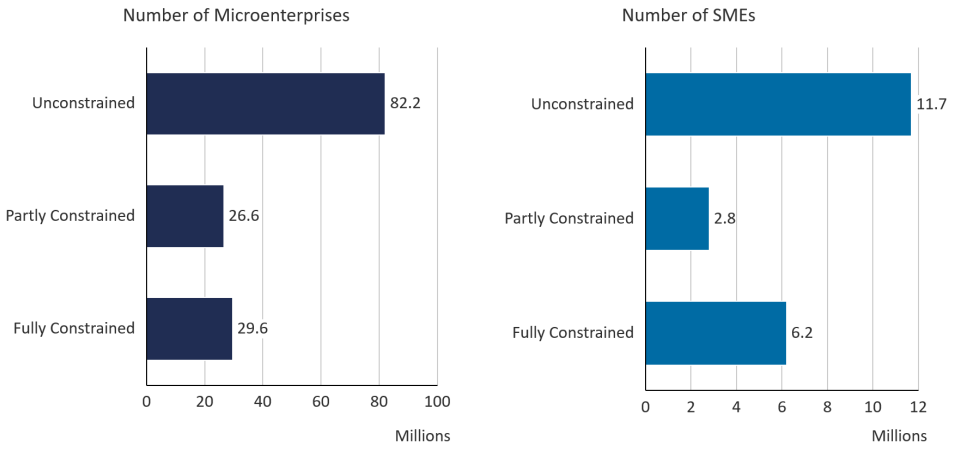
While the lack of digital skills (Policy Action 1.2) is a significant hurdle, MSMEs face other challenges before they can achieve digital adoption at the same level as their larger peers. The actions below focus on providing funding, knowledge, and the necessary tools for an effective and safe digital transformation.

The G20 should expand efforts to offer sustainable financing to accelerate MSME adoption of digital technologies (e.g., flexible collateral options, tools for better corporate accounting)

> Aligned with B20 Indonesia and B20 India's call to provide sustainable finance to bridge the MSME finance gap and enable their digital transformation.

In addition to previously presented barriers to MSME digitalization, the finance gap—the lack of resources to fund their digital transformation—is a significant challenge. Evidence indicates that MSMEs are severely underfunded. (Exhibit 9).

Exhibit 9 | Number of financially constrained MSMEs

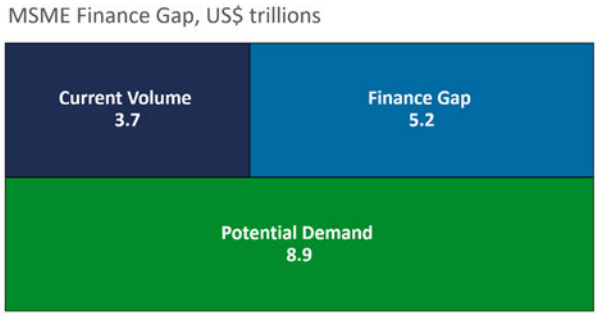


Source: International Finance Corporation (IFC)

It is estimated that in developing countries, 21 percent (29.6 million) of microenterprises are fully constrained, and 19 percent (26.6 million) are partially constrained. Only 60 percent (85.2 million) remain financially unconstrained. A similar picture can be observed in the SME segment, where 30 percent (6.2 million) are fully constrained, 14 percent (2.8 million) are partially constrained, and only 56 percent (11.7 million) are unconstrained.[49]

A study conducted by the International Finance Corporation in 2017 concluded that the unmet demand for financing in the MSME segment in developing countries is valued at USD 5.2 trillion, which represents 19 percent of these countries' cumulative GDP[50]. Of a total of USD 8.9 trillion in potential demand for MSME finance, only USD 3.7 trillion is currently being supplied. This means that 59 percent of potential demand for MSME finance is unmet (Exhibit 10)[51].

Exhibit 10 | MSME finance gap



Source: International Finance Corporation (IFC)

Estimates show that there is an additional USD 2.9 trillion potential demand for MSME finance in the informal sector in developing countries, which represents 11 percent of the GDP of these countries. The combined total formal and informal potential demand for MSME finance in developing countries is, therefore, estimated at USD 11.9 trillion[52].

To address this gap, G20 countries should facilitate MSME access to traditional and alternative financing solutions.

49 INTERNATIONAL FINANCE CORPORATION - IFC. **MSME FINANCE GAP**: assessment of the shortfalls and opportunities in financing. 2017.
50 INTERNATIONAL FINANCE CORPORATION - IFC. **MSME FINANCE GAP**: assessment of the shortfalls and opportunities in financing. 2017.
51 INTERNATIONAL FINANCE CORPORATION - IFC. **MSME FINANCE GAP**: assessment of the shortfalls and opportunities in financing. 2017.
52 INTERNATIONAL FINANCE CORPORATION - IFC. **MSME FINANCE GAP**: assessment of the shortfalls and opportunities in financing. 2017.

On the traditional debt-based bank financing side, measures may include allowing flexible collateral options beyond fixed assets (e.g., intellectual property and accounts receivable), improving credit guarantees, providing risk diversification instruments and underwriting methodologies, and helping MSMEs improve their corporate accounting and the availability of credit information, essential parts of loan applications where smaller companies often fall short.

On the alternative financing side, measures may include fostering a regulatory environment that encourages the safe expansion of Microfinance & Microcredit Institutions (MFIs) and Non-Banking Financing Companies (NBFCs), while streamlining the application process for MSMEs to access credit. This approach should be supported by a rigorous and comprehensive risk analysis framework to identify and mitigate potential risks associated with different financing instruments.

The G20 should leverage digital technologies to enhance financial inclusion of MSMEs

Disparities in access to financing and financial instruments, coupled with a reliance on cash-based transactions, impede the full participation of some MSMEs within the formal financial system. This exclusion restricts their ability to leverage a range of benefits, including financing solutions, investment and insurance products, secure payment processing, and transparent financial transactions. Moreover, their exclusion from the formal financial system limits their use of e-commerce platforms and other digital solutions that are crucial for business growth in the current landscape.

The G20 members should foster public-private partnerships that utilize digital technology to tackle this issue. Potential targeted initiatives include the development of platforms that enable the digitalization of payments, marketplaces, workflows for better inclusion into value chains, and better tracking of financial and operational data (Box 1.7).

Box 1.7: Brazil's Pix instant payment solution

Launched in November 2020 by the Central Bank of Brazil, Pix is an instant payment system that enables the rapid transfer of funds between individuals and businesses at low- or zero-cost with full-time availability. The objective was to reduce reliance on cash for transactions, increase financial inclusion, strengthen competition in the banking system, and modernize the payment system for faster and more secure transactions.

Pix built upon the success of Brazilian neobanks—which drove a surge in bank account ownership and financial inclusion using digital-first, commercially sustainable business models—to accelerate financial inclusion. The Brazilian central bank implemented and offered policy support to Pix, mandating its integration into banking apps to spur rapid adoption and boost payment volumes.

By 2023, two-and-a-half years after its launch, the system had been used by more than 140 million individuals (about 80 percent of the adult population) and 13 million firms, exceeding adoption expectations. Pix now accounts for over three billion transactions each month.

Pix has accelerated financial inclusion of individuals and small business and created new opportunities for previously digitally and/or financially marginalized groups. According to the World Bank's Findex, eighty-four percent of Brazilians were banked by 2021, up from seventy percent in 2017. By December 2022, 71.5 million individuals who had not made any electronic credit transfers prior to the launch of Pix had become Pix uses, and a 2023 survey found that Pix was the most popular payment method among clients of small businesses, surpassing cash, credit and debit cards, and bank transfers.

Source: Central Bank of Brazil, IMF eLIBRARY, Sebra, World Bank

The G20 should support the development of local organizations that assist MSMEs with resources during their digital transformation journey, and improve the collection, analysis, and availability of MSME data for more effective public and private action

> Expanding on B20 Italy, B20 Indonesia, and B20 India's call for resources and tools to promote MSME awareness of the potential digital tools and their benefits—the use case library made by B20 Italy team and further improved by the B20 Indonesia team serving as an example.

In addition to insufficient funding and complex regulatory environments, MSMEs often face the challenge of limited awareness of the potential use cases and the benefits of technology deployment, which hinders their ability to identify the right tools and strategies to achieve their specific business goals. Furthermore, limited expertise in implementing and using digital tools can further impede their digital transformation journey.

To help bridge this gap, the G20 should empower existing MSME-dedicated entities, or, in countries where they are lacking, promote the creation of such entities to act as partners to small businesses during their digital transformation by providing specialized know-how and supporting tools (Box 1.8). Those entities typically understand the specific needs of MSMEs, and can effectively lead initiatives such as:

- **Knowledge Hubs:** Serve as a one-stop shop for curated information and resources on various digital technologies relevant to different MSME sectors. This includes use-case catalogs, industry-specific case studies, best practices, and success stories showcasing the tangible benefits of technology adoption.
- **Toolkits and Guides:** Develop practical toolkits and guides tailored to the needs of MSMEs, providing maturity assessment tools and offering step-by-step instructions on implementing specific digital tools and strategies. These resources should be readily available in local languages and easily accessible through online platforms.
- **Training and Capacity Building:** Provide targeted training programs and workshops to equip MSME owners and employees with the necessary skills and knowledge to effectively utilize digital tools. This can include hands-on training sessions, online courses, and mentorship opportunities from digital experts.
- **Networking and Collaboration:** Facilitate networking opportunities and collaborative platforms for MSMEs to connect with peers, share experiences, and learn from each other's successes and challenges in their digital transformation journeys.

This effort, however, requires G20 countries to improve the collection, analysis, and availability of MSME data for use by both governments and MSMEs (e.g., percentage with high-speed internet access). Currently, the limited segregated data concerning MSMEs poses a significant obstacle in crafting effective, targeted initiatives for digital transformation.

To tackle this issue, G20 countries should explore innovative methods of data collection in concert with the private sector and multilateral organizations. They should also establish size and/or industry segmentation guidelines for all MSMEs, allowing governments to better target aid and resources based on specific needs. Additionally, efforts to measure the impact of MSME-targeted programs should be established or expanded to improve current support programs and to design or adapt future ones.

Box 1.8: Brazilian Micro and Small Business Support Service (Sebrae) and National Service for Industrial Learning (SENAI)

The Brazilian Micro and Small Business Support Service (Sebrae) is a nonprofit organization that acts as a champion for small businesses in Brazil. Their mission is to propel the sustainable and competitive development of micro and small enterprises and foster an environment that encourages entrepreneurship throughout the country. Sebrae supports small businesses in Brazil through guidance and consultancy, training and educational programs, improved business environment, and access to markets, credit, and technology.

Digital Transformation Journey

In collaboration with the National Service for Industrial Learning (SENAI), the Federation of Industries of the State of São Paulo (FIESP), and the Center of Industries of the State of São Paulo (CIESP), Sebrae has launched the Digital Transformation Journey program to foster digital adoption among MSMEs.

The free program combines consulting, training, and financing solutions to support businesses on their digital transformation path. Specialized consultants identify areas for improvement and recommend digital solutions, and supporting training courses equip employees with the skills needed to leverage these new technologies. Additionally, the program offers a special credit line with favorable interest rates to help companies finance implementation of the recommended tools.

This comprehensive approach aims to ensure that businesses have the resources and expertise needed to successfully achieve their digital transformation goals. Since its inception in 2022, the program has supported over 10,000 businesses and provided an average productivity gain of 35 percent.

IT Training Program

In response to the high demand from the productive sector for skilled professionals, SENAI has launched the IT Training Program. Through technical high school qualifications, higher education qualifications, and initial and continuing education programs, the institution is collaborating with major players from the technology sector to provide training on technologies such as cloud computing, artificial intelligence, cybersecurity, system development, back-end development, front-end development, mobile development, and networks. By 2025, SENAI's IT Training Program aims to equip 315,000 individuals with in-demand tech skills.

Source: SEBRAE, SENAI

The G20 should Promote a favorable regulatory environment and e-government services to alleviate the administrative burden for MSMEs

> Building on B20 India's call for a favorable regulatory environment and e-government services to alleviate the administrative burden for MSMEs.

The administrative burden and the complexity of regulatory procedures remain a major obstacle to entrepreneurial activity, and they often disproportionally impact smaller companies[53]. Given the substantial fixed costs of compliance with regulatory requirements and the typically lower level of internal expertise of MSMEs compared to their larger competitors with more human and financial resources, administrative burden tends to be heavier for the former.

To tackle this issue, G20 members should provide a supportive legal, regulatory, and business infrastructure to enable MSMEs to operate with minimal administrative burden. Potential initiatives include:

- **Laws that support digitalization uptake:** Digital tools can be employed to simplify administrative tasks that typically require significant MSME time and money investment. Digital signature and electronic authentication, for instance, allow for quick and seamless contracts, transactions, and approvals, but require supporting laws for effectiveness.
- **One-stop shops and digital portals:** The complexity involved in dealing with multiple, often conflicting, administrative systems can be mitigated through the creation of one-stop shops and

53 OECD. **Strengthening SMEs and entrepreneurship for productivity and inclusive growth**. 2019.

digital portals which provide businesses with information on what the applicable administrative and legal requirements are and how to comply with them more easily.

- **Compliance management tools:** Automated verification tools can streamline compliance checks (legal, administrative, security) for businesses by reducing manual effort, improving accuracy, enabling real-time monitoring, and simplifying reporting. Governments can promote adoption by simplifying integration with government systems, developing free/affordable options, and offering financial assistance.
- **Platforms that promote higher market access:** Governments can help MSMEs to connect with consumers and other businesses through e-commerce platforms, enabling greater market access (Box 1.9).

Box 1.9: India's Open Network for Digital Commerce (ONDC)

In India, more than 12 million sellers earn their livelihood by selling or reselling products and services. However, only 15,000 of these sellers (0.125 percent of the total) have enabled e-commerce. E-retail has been out of reach for the majority of sellers, especially from small towns and rural areas.

To bridge this gap, India launched the Open Network for Digital Commerce (ONDC) platform, promoting an open e-commerce network that connects shoppers, platforms, and retailers. ONDC acts as a bridge between different e-commerce platforms, enabling them to connect and work together seamlessly. This shift transforms e-commerce from a platform-centric model to an open one, where the limitations imposed by the specific platforms used by buyers and sellers no longer apply.

In January 2024, one year after its inception, ONDC crossed 6.75 million cumulative orders. The network now has more than 370,000 sellers and service providers and serves over 588 cities.

Source: ONDC, The Economic Times

RECOMMENDATION 2

Recommendation 2

Recommendation is aligned with previous B20 editions

Safeguard individuals and organizations and promote digital trust while enabling innovation and development by harmonizing cybersecurity and data protection standards, coordinating international cyber action, and advocating for Data Free Flow with Trust.

Policy Actions

Policy Action 2.1 – Foster multilateral cooperation to improve international cyber action—from incident prevention, identification, and containment to investigation and legal action—leveraging harmonized cybersecurity and cyber resilience standards.

Policy Action 2.2 – Make progress on Data Free Flow with Trust by building on prior consensus while tailoring the approach to the G20 members to enable innovation, economic growth, and social well-being while building trust on a global scale.

Key Performance Indicators	Baseline	Target	Classification
Time to identify and contain a breach Composite of two KPIs: Mean Time to Identify (MTTI) + Mean Time to Contain (MTTC) *Source: IBM*	**277 days** (2023)	**200 days** (2027)	New indicator
Minimum score achieved by a G20 country on Global Cybersecurity Index (composite of 20 indicators) *Source: International Telecommunication Union (ITU)*	Africa: **5** Americas: **50** Asia-Pacific: **93** Europe: **67** (2020)	**90** across regions (2027)	Aligned with previous B20s editions
Percentage of countries with data protection and privacy legislation[54] *Source: United Nations Conference on Trade and Development (UNCTAD)*	**71%** (2023)	**100%** (2027)	Aligned with previous B20s editions

54 Once efforts to define international Data Free Flow with Trust concepts are more advanced, the B20 Brasil Digital Transformation Task Force recommends expanding the KPI to measure not only the percentage of countries with data protection and privacy regulation, but also how aligned they are with DFFT principles. Currently, indicators of international data flow (e.g., volume and growth of international bandwidth usage) and openness/restrictiveness of national policies (e.g., Global Data Alliance's Cross Border Data Policy Index) can provide some insight.

SDGs Impacted

Recommendation 2 contributes to the achievement of the following UN's SDGs:

SDG 8: decent work and economic growth, SDG 9: industry innovation and infrastructure, SDG 16: peace justice and strong institution, and SDG 17: partnership for the goals.

More details in Annex A

Relevant B20 Brasil Guiding Claims

Recommendation 2 has the strongest impact on two B20 Brasil Guiding Claims:

Foster the resilience of Global Value Chains

Increase productivity through innovation

More details in Annex B

Relevant G20 Brasil Priorities

Recommendation 2 contributes to the priorities of the G20 Brasil **Digital Economy Working Group** and **Research and Innovation Working Group**

More details in Annex C

Context

Cybersecurity and cyber awareness

Security and trust have become an important concern for individuals, businesses, and governments around the world, and are now considered key prerequisites for successful digital transformation. While the adoption of technology and increasing reliance on interconnected networks have brought about unparalleled opportunities for growth and innovation, they have also heightened the risk of cyber incidents causing financial, operational, and reputational damage to organizations and individuals.

From a business standpoint, cybersecurity refers to the protection of digital resources, including sensitive data, intellectual property, and critical infrastructure, from cyber incidents. In this context, cybersecurity measures focus on the continuity of organizations' operations, the protection of their customers' data, and the preservation of their reputation, as opposed to broader national security concerns such as cyberterrorism.

Critical infrastructure, such as communication networks and power grids, is becoming more complex and reliant on connected devices. What used to be isolated is now part of a network and therefore susceptible to cyber incidents. Failure of critical infrastructure caused by an accident or malicious cyberattack has become a looming threat. In the EU, events targeting digital infrastructure already represent 7 percent of the total; and events targeting digital service providers, 6 percent[55].

It is important to note that cyber incidents encompass a broader spectrum than just malicious attacks. While malicious actors like hackers pose the most significant threat, accidental incidents are also possible. These can range from human error to system malfunctions or software vulnerabilities. Recognizing this wider scope is crucial for effective cybersecurity.

Regarding malicious attacks, their frequency and severity have been steadily increasing, with many high-profile companies and organizations falling victim to data breaches and other forms of cybercrime. The reasons behind these attacks vary, but attackers are typically moved by money, recognition, and political or social causes[56].

The COVID-19 pandemic has also had a significant impact on cybersecurity. Many organizations and individuals were forced to move to remote work and increase their online presence, creating new vulnerabilities for attackers to exploit, and the rapid shift to online—needed to minimize operational downtime— often came at the expense of more robust security measures.

The resulting financial damage is substantial. Estimates from Cybersecurity Ventures reveal that global cybercrime is predicted to cost a total of USD 9.5 trillion in 2024 and USD 10.5 trillion by 2025. If it were measured as a country, cybercrime would be the world's third largest economy after the United States and China[57].

This translates into significant losses for businesses and organizations. According to IBM's *The Cost of a Data Breach* report, the average total cost of a data breach is already estimated to be USD 4.45 million in 2023, split into four process-related categories[58]:

- **Detection and escalation** (36 percent of total cost in 2023): Activities that enable a company to detect the breach, including forensic and investigative activities, assessment and audit services, and crisis management.
- **Notification** (8 percent): Activities that enable the company to notify data subjects, data protection regulators, and other third parties, including emails, letters, outbound calls or general notices to data subjects, communication with regulators, and engagement of outside experts.
- **Post-breach response** (27 percent): Activities to help victims of a breach communicate with the company and conduct redress activities to victims and regulators, including legal expenditures, product discounts, and regulatory fines.
- **Lost business** (29 percent): Activities that attempt to minimize the loss of customers, business disruption, and revenue losses, including business disruption and revenue losses due to system downtime, cost of losing customers and acquiring new customers, and reputational damage and diminished goodwill.

55 ENISA. **Threat Landscape 2023**. 2023.

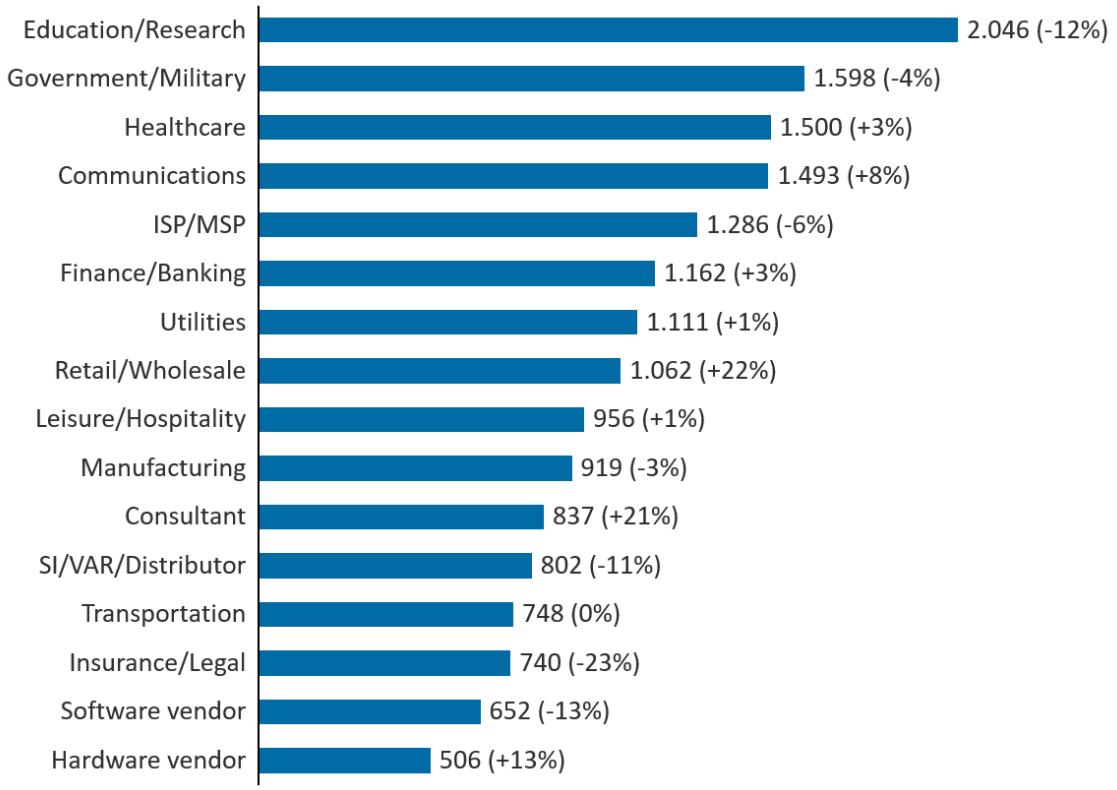
56 CHECK POINT RESEARCH. **2024 Cyber Security Report**. 2024.

57 CYBERSECURITY VENTURES. **2023 Official Cybercrime Report**. 2023.

58 IBM. **The Cost of a Data Breach**. 2023.

Although cybersecurity is a cross-industry issue, not all sectors are affected equally. The education, government, and healthcare sectors are currently the primary targets, experiencing over 1,500 weekly cyberattack attempts (Exhibit 11). This is predominantly due to the valuable and sensitive resources these industries possess. In the healthcare sector, for instance, cybersecurity goes beyond protecting patients' data and companies' operational and financial integrity; it encompasses maintaining vital systems and equipment. Nevertheless, factors such as limited investment in cybersecurity, particularly in schools, also contribute to their vulnerability[59].

Exhibit 11 | Global average of weekly attacks per organization by industry in 2023 [% of change from 2022]



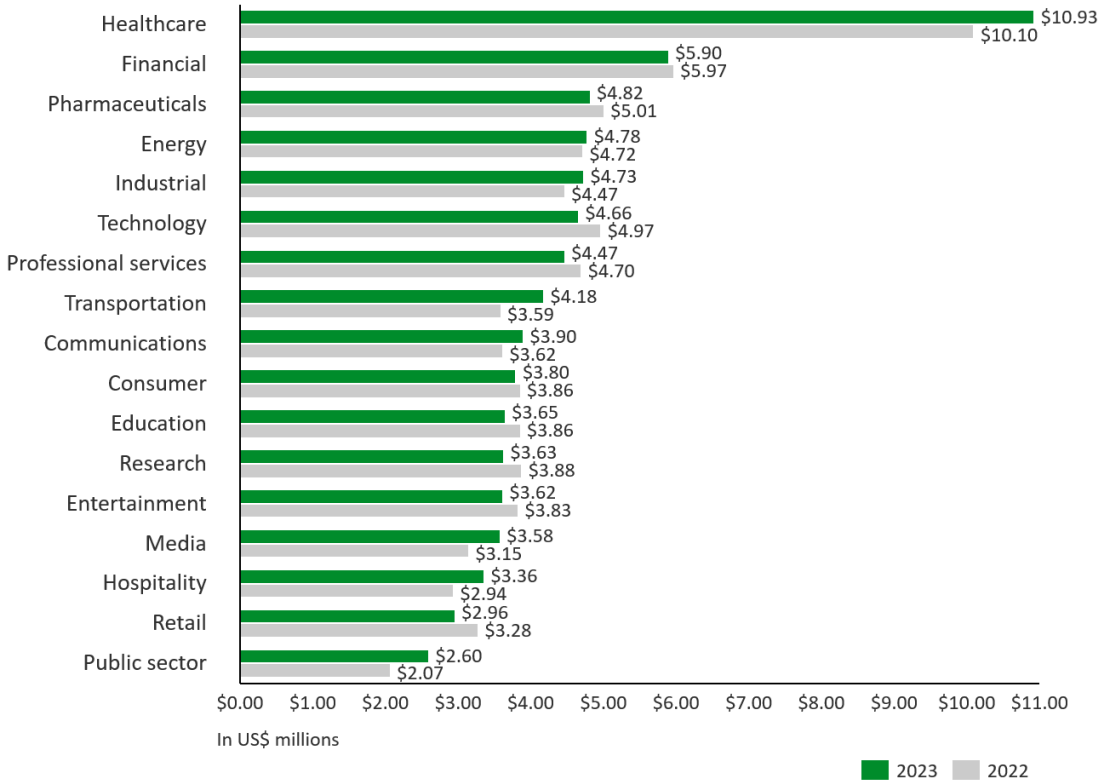
Note: SI = System Integrator. VAR = Value-Added Reseller. ISP = Internet Service Provider. MSP = Managed Service Provider; Source: Check Point Research

In terms of impact, significant differences exist among industries as well. While the average total cost of a data breach is USD 4.45 million, that number exceeds USD 10 million in the healthcare industry (Exhibit 12)—nearly double the cost of a breach in the financial industry, which ranks second highest. Since 2020, healthcare data breach costs have increased 53.3 percent[60].

59 CHECK POINT RESEARCH. **2024 Cyber Security Report**. 2024.

60 IBM. **The Cost of a Data Breach**. 2023.

Exhibit 12 | Cost of a data breach by industry



Source: IBM, The Cost of a Data Breach (2023)

Six main trends are currently driving the global cybersecurity landscape, according to the Charter of Trust:

- **Growing cyber risk to businesses:** Not only has the number of cyberattacks increased, but also the implications for organizations that fall victim. As digitalization continues, incidents tend to have greater financial, operational, reputational, and legal impacts.
- **Fundamental technological changes:** First, emerging technologies intensify long-standing challenges, as adopting them requires understanding their implications for each company's cyber resilience. Second, they create additional challenges by introducing new vectors that malicious actors can exploit.
- **Workforce gap is widening:** The demand for skilled cybersecurity professionals significantly outpaces the available talent pool. According to Cybersecurity Ventures, the number of unfilled cybersecurity jobs worldwide grew 350 percent between 2013 and 2021, from one million to three-and-a-half million (8). In a survey conducted by the WEF, 36 percent of respondents said that skills gaps are the main challenge to achieving their cyber resilience goals (30).
- **Increasing professional hacking:** Cybercrime is becoming more organized and professional, with hackers often operating as part of larger criminal networks or state-sponsored groups. These attackers have access to sophisticated tools and techniques and often offer their services on the dark web (e.g., Ransomware-as-a-Service).
- **More laws and regulations worldwide:** Governments are recognizing the importance of cybersecurity and are introducing stricter data privacy laws and cybersecurity regulations to protect citizens and businesses from cyber threats. Organizations must stay informed and comply with these regulations, which can vary across different jurisdictions, to avoid hefty fines and reputational damage.

- **Challenging local vs. global regulation:** The global nature of the Internet and the interconnectedness of businesses mean that cyber threats often transcend national borders. However, balancing local and global regulatory requirements is a challenge for businesses that operate internationally and need to navigate a patchwork of regulations.

All those trends indicate that cybersecurity and digital trust are on track to become even more relevant in the coming years. However, while the core principles remain, threats and concerns will continue to morph as technology evolves. AI-generated misinformation and disinformation, for example, were voted as the second top risk in the WEF's Global Risks Perception Survey 2023-2024. As mentioned in the WEF's Cybersecurity Futures 2030 report: "cybersecurity will become less about protecting the confidentiality and availability of information and more about protecting its integrity and provenance."

The ever-evolving threat landscape requires a global effort. Companies and countries worldwide must collaborate and leverage the power of cutting-edge technologies for an enhanced cyber response. AI, for instance, can analyze vast amounts of data to identify suspicious activity, predict attacks, and even automate parts of the security response, freeing up valuable time for security professionals. A study conducted by IBM revealed that organizations that used security AI and automation experienced, on average, a 108-day shorter time to identify and contain the breach and a USD 1.76 million lower data breach cost (29). By combining traditional methods with the power of new technology, organizations can build a more robust defense against the ever-present threats of the digital age.

Data privacy and cross-border data flow

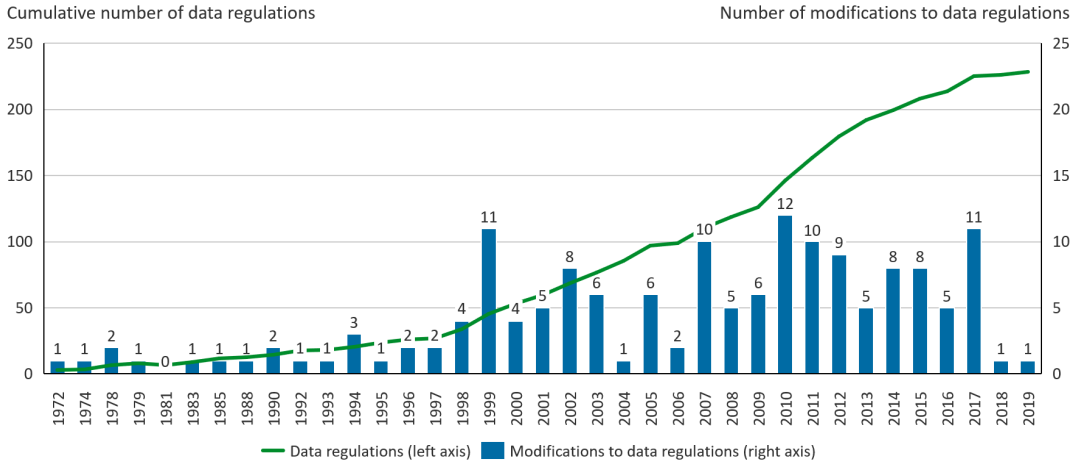
In the era of digital transformation, data has become a precious resource. As technology evolves and connectivity increases, the seamless flow of data across borders becomes crucial for innovation across sectors and global economic growth. ITU data shows that international bandwidth usage, which serves as a measure of cross-border data flow, increased sixfold from 2016 to 2022, reaching 1,200 Tbit/s worldwide[61]. The OECD further emphasizes that "cross-border data flows are critical for the global economy and achieving the United Nations Sustainable Development Goals"[62].

Two main trends have accelerated the generation, collection, and use of data: key sectors such as education, energy, retail, transports, health, finance, and government services undergoing a digital transformation; and new data-intensive digital technologies such as the Internet of Things (IoT) and artificial intelligence (AI) being increasingly adopted.

While data sharing is essential to enabling the development and widespread adoption of digital technology and creating significant social and economic value, discussions about cross-border data flows are often complex because they touch on important policy concerns, such as protecting privacy and personal or other sensitive data, digital security and safety, and national security[63,64]. These concerns are leading to an increase in national regulations that constrain data flow and increase data localization requirements. In the period of 2009 to 2019, the number of data regulations worldwide nearly doubled (Exhibit 13)[65].

61 INTERNATIONAL TELECOMMUNICATIONS UNION - ITU. **Measuring digital development**: facts and figures 2022. 2022.
62 OECD. **Moving forward on data free flow with trust**: new evidence and analysis of business experiences. 2023.
63 OECD. **Moving forward on data free flow with trust**: new evidence and analysis of business experiences. 2023.
64 OECD. **Fostering cross-border data flows with trust**. 2022.
65 OECD. **Fostering cross-border data flows with trust**. 2022.

Exhibit 13 | Measures affecting cross-border data flows



Note: The figure captures measures conditioning the movement of data across international borders or mandating that data can be stored domestically.
Source: Casalini and López González (2019); OECD, Trade and Cross-Border Data Flows (2019)

Although aimed at ensuring data privacy and protection, this surge in data regulations has inadvertently created negative externalities. The emergence of multiple and often conflicting data flow regulations has made the regulatory landscape complex and fragmented, and traditional measures to address these differences—the bilateral negotiation of adequacy agreements between privacy regimes—prove difficult to scale globally. This patchwork of approaches not only slows technological development but also hinders the widespread adoption of potentially beneficial digital solutions. Moreover, it creates additional challenges for businesses and risks fostering a silo-oriented digital economy[66].

From a business standpoint, METI's report has identified the following barriers related to global regulatory fragmentation and rising data localization[67,68,69]:

- Overlapping regulations within countries, which may be caused by digital silos among domestic regulators.
- Lack of legal transparency resulting from multilayered regulatory requirements.
- Lack of legal stability due to frequent changes in requirements and related research costs for companies.
- Insufficient understanding by regulators of the business realities of cross-border data flows.
- Significant costs associated with obtaining certification for data handling.
- Lack of clear definitions of "cross-border flows," "personal data," and other concepts.

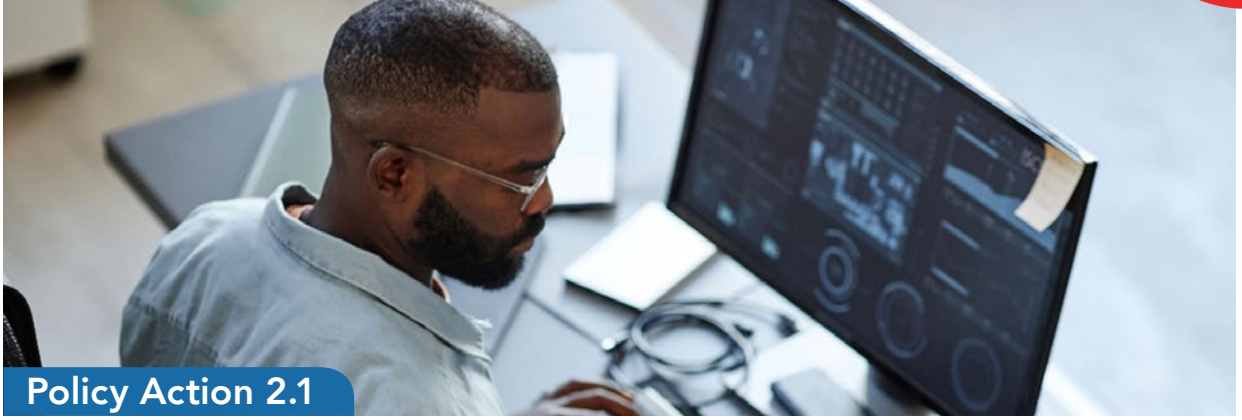
These barriers have a significant impact on essential sectors. The Healthcare Information and Management Systems Society (HIMSS) highlights that the "dire need for global convergence around laws, regulations, and policies that govern the secure cross-border access to and exchange of health data" is one of the main challenges that health systems around the world face today. Data flow restrictions directly impact innovation in medicine and biomedical research, which rely on the processing of large amounts of data collected globally to support all stages of research and development (R&D) and the commercialization of new drugs and therapies. Moreover, cross-border health data flows are essential to facilitate care in a globalized world, where patients are increasingly mobile and digital technology enables new forms of care through telemedicine[70].

66 WORLD TRADE ORGANIZATION - WTO. **Digital trade for development**. 2023.
67 WORLD TRADE ORGANIZATION - WTO. **Digital trade for development**. 2023.
68 OECD. **Fostering Cross-border Data Flows with Trust**. 2022.
69 UN TRADE AND DEVELOPMENT - UNCTAD. **Digital Economy Report 2022**: cross-border data flows and development: for whom the data flow. 2021.
70 HEALTHCARE INFORMATION AND MANAGEMENT SYSTEMS SOCIETY - HIMSS. **Empowered by the cloud**: How cross-border health data flows can create value for patients and boost health system efficiency. 2023.

In this context, the concept of Data Free Flow with Trust (DFFT) has emerged to strike a balance between allowing data to move seamlessly across borders for innovation and economic growth, while ensuring trust through robust privacy and security measures. By establishing common principles and fostering cooperation between countries, DFFT aims to create a transparent and predictable environment for the digital age.

Since its introduction in 2019, Data Free Flow with Trust (DFFT) has been discussed in numerous international forums, garnering increasing support. At the G7 Hiroshima summit in 2023, DFFT reached a new stage as G7 leaders reaffirmed their commitment to operationalizing the concept—in line with the 2019 G20 Osaka Leader's Declaration, the UK 2021 G7 Roadmap for Cooperation on Data Free Flow with Trust, and the German 2022 G7 Action Plan for Promoting Data Free Flow with Trust—and endorsed the creation of the Institutional Arrangement for Partnership (IAP) to facilitate its coordination. At the OECD, DFFT was a motivator for the creation of Trusted Government Access principles, which describe privacy safeguards in national security laws.

As the complexity of the global data policy landscape continues to increase—particularly with the growing restrictiveness of data regulations worldwide and the rising number of countries embracing data localization practices—it is imperative that countries join efforts to reduce the costs and risks associated with geopolitical fragmentation and unlock the potential of digital innovation.



Policy Action 2.1

Foster multilateral cooperation to improve international cyber action—from incident prevention, identification, and containment to investigation and legal action—leveraging harmonized cybersecurity and cyber resilience standards.

Executive Summary

To achieve this goal, the G20 should:

- Identify a nongovernmental organization from each country or region to complement public and private cybersecurity efforts locally and internationally and connect them via a global collaboration network.
- Ensure convergence between global cybersecurity standards and develop a common open-source framework to create a consistent approach to cybersecurity and improve cross-border and cross-sector interoperability.
- Improve international collaboration for detection and mitigation of cyber incidents by standardizing response processes, establishing secure information-sharing platforms, increasing the cyber forensics ability of the international law enforcement community, and developing international legal frameworks to hold people involved in cyber incidents accountable.
- Bridge the cybersecurity skills gap by building widespread cyber awareness and addressing the global cybersecurity talent shortage.

Background and Context

It takes 277 days on average to identify and contain a data breach, with 207 days dedicated to identifying it and an additional 70 days to containing it[71]. This prolonged duration highlights the need for effective cybersecurity measures.

Part of this challenge stems from the complex global regulatory landscape. Over 130 countries have data protection and privacy legislation[72], making it especially difficult for multinational businesses to navigate the web of multiple intersecting and overlapping laws.

Another complicating factor is the multitude and multilocation nature of stakeholders involved in identifying and containing an incident, investigating its origin, and taking legal action. Policymakers, national cybersecurity agencies (e.g., CISA in the United States), Cybersecurity Emergency Response Teams (CERTs), and threat reporting bodies (e.g., FIRST, Cyber Threat Alliance) across jurisdictions are just a few examples of organizations that are typically mobilized.

71 IBM. **The Cost of a Data Breach**. 2023.

72 UN TRADE AND DEVELOPMENT - UNCTAD. **Data Protection and Privacy Legislation Worldwide**. Available at: https://unctad.org/page/data-protection-and-privacy-legislation-worldwide. Accessed in: 05 jan. 2024.

To address this issue and reduce the threat and impact of cybercrime, countries must strengthen multilateral collaboration, ultimately minimizing the time it takes to detect and contain incidents and enhancing the overall resilience of the global digital ecosystem.

The G20 should identify a nongovernmental organization from each country or region to complement public and private cybersecurity efforts locally and internationally and connect them via a global collaboration network

Cybersecurity threats are global, but solutions often remain fragmented across and within national borders, creating gaps in defenses and hindering effective responses. Empowering a nongovernmental organization from each country or region to enhance local and international cyber action can help establish a robust international cybersecurity ecosystem. This would bridge the gap between national borders, augmenting the efforts of government bodies and CERTs[73], and creating a more unified front against cyber incidents.

The objectives of these non-governmental organizations would include collaborating with international bodies such as the International Telecommunication Union (ITU), the Forum of Incident Response and Security Teams (FIRST), and the Global Forum on Cyber Expertise (GFCE) to facilitate the sharing of cyber incidents and vulnerability reporting. By leveraging these established platforms, countries can ensure timely and effective dissemination of critical information, thereby strengthening global cyber resilience and response capabilities.

Selected organizations could be a specialist organization in the cybersecurity domain, a part of a trade body, or even a subsidiary of the government set up. The criteria for selection should include technical expertise in the subject matter, program management ability to develop and advise frameworks internally, and research and advocacy capability to share findings with the network, as well as reach and credibility to engage with governments and the business community.

In terms of mandates, these organizations should:

- Work toward harmonization of global cybersecurity frameworks and standards, as well as convergence of regulations to improve cross-border and cross-sector interoperability.
- Coordinate incident response and recovery for faster and more effective response to cyberattacks.
- Define and track new KPIs at the international level to assess progress on cyber resilience.
- Facilitate the sharing of expertise and training modules to strengthen local cybersecurity skills, fostering a more knowledgeable and resilient global community.
- Promote cybersecurity awareness through collaborative development and dissemination of educational materials.
- Act as a centralized point of contact and promote multistakeholder engagement by bridging the gap between businesses, governments, and civil society.

To support the development of this international network, the G20 members should also establish forums, processes, and tools for communication, information sharing, capacity building, and collaborative projects.

73 Computer Emergency Response Teams.

Box 2.1: Data Security Council of India

The Data Security Council of India (DSCI) is a nonprofit industry body focused on data protection in India, established by NASSCOM, India's National Association of Software and Service Companies.

DSCI aims at making the cyberspace safe, secure, and trusted by establishing best practices, standards, and initiatives in cyber security and privacy. The council develops best practices and frameworks, publishes studies, surveys, and papers and builds capacity in security, privacy, and cyber forensics through training and certification programs. Additionally, DSCI engages stakeholders through outreach initiatives such as events, awards, chapters, consultations, and membership programs.

Source: Data Security Council of India

The G20 should ensure convergence between global cybersecurity standards and develop a common open-source framework to create a consistent approach to cybersecurity and improve cross-border and cross-sector interoperability

> Aligned with B20 Indonesia and B20 India's call for cybersecurity and cyber resilience interoperable, risk-based standards

Currently, the global cybersecurity landscape is fragmented, with over 20 different cybersecurity standards offering guidance on cyber risk management. While prominent frameworks like NIST, ISO 27001, and FFIEC CAT provide comprehensive guidelines individually, the lack of harmonization creates significant complications for organizations worldwide. Each standard sets its own requirements with varying levels of depth, leading to extra complexities and inefficiencies for businesses. Estimates suggest that over 40 percent of cybersecurity budgets are typically spent on compliance reporting alone[74].

To address this challenge, G20 members should work together to establish trust and promote international interoperability of risk-based security and privacy protection standards across jurisdictions. This can be achieved by identifying common elements among existing guidelines and creating a single and consistent framework that balances the needs of various stakeholders. Shared frameworks and standards should be flexible, technology-neutral, and based on a risk-based approach that prioritizes effective outcomes over rigid control, allowing organizations to adapt individual approaches based on their priorities, systems, and risks.

The G20 should collaborate with stakeholders to secure widespread adoption of harmonized standards and actively maintain them through ongoing monitoring to ensure relevance and effectiveness in the global cyberspace.

The G20 should Improve international collaboration for detection and mitigation of cyber incidents by standardizing response processes, establishing secure information-sharing platforms, increasing the cyber forensics ability of the international law enforcement community, and developing international legal frameworks to hold people involved in cyber incidents accountable

One major challenge in addressing cybersecurity incidents is the multitude and multilocation nature of stakeholders involved. Effective response requires identifying and containing the incident, investigating its source, and potentially pursuing legal action.

To address this challenge, G20 members should foster collaboration for cyber response by:

- **Standardizing cyber incident response:** establishing a standardized framework for incident response can create a common language and process, allowing stakeholders across borders to communicate efficiently, understand roles, and collaborate efficiently during an incident.

74 FORBES. **Cutting the Cost and Complexity of Cybersecurity Compliance**. 2022.

- **Establishing secure information-sharing platforms:** creating secure, international platforms for sharing information, threat intelligence and attack indicators can allow different countries to identify and more quickly defend against cyber incidents.
- **Enhancing cyber forensics capabilities:** sharing cybersecurity knowledge, training personnel in advanced digital investigation, and equipping them with modern tools can help build a skilled law enforcement workforce able to effectively identify, address, and trace the origins of cyber incidents.
- **Developing international legal frameworks:** converging on international legal frameworks to address cybercrime. This includes establishing clear jurisdictional boundaries and crafting international regulations to hold cybercriminals and other involved parties (e.g., financiers and facilitators) operating across borders accountable.

The G20 should bridge the cybersecurity skills gap by building widespread cyber awareness and addressing the global cybersecurity talent shortage

> Aligned with B20 Indonesia and B20 India's call for advocating cyber awareness to the grassroots level bridging the cybersecurity skills gap

Cyber awareness is the understanding of the risks associated with online activity and the ability to safely navigate the digital world. This includes understanding how to protect sensitive information, recognizing phishing scams, avoiding malware, and securing online accounts.

The ITU highlights in its latest Global Connectivity Report that many people are acquiring digital skills informally, often leading to a lack of awareness about the risks involved, how to protect their privacy, and how to distinguish between fact and misinformation[75]. For instance, the growing popularity of online banking, while convenient, creates new vulnerabilities for criminals to exploit. Phishing scams allow them to trick users into revealing sensitive information and gain access to their online bank accounts.

This lack of basic cyber awareness is reflected in the number of vulnerabilities affecting businesses. Estimates show that 95 percent of cybersecurity issues can be traced to human error and insider threats (intentional or accidental) represent 43 percent of all breaches[76].

To bridge this gap, G20 nations should focus on educating the larger community about digital safety and spread awareness about preventive and curative actions required to be taken in response to the threats that exist in cyberspace. The G20 countries should focus on multilateral efforts toward public awareness campaigns that educate the public about cyber threats and give them the tools they need to stay safer and more secure online.

Building basic cyber awareness, however, is not enough. A survey conducted by the WEF revealed that the cyber-skills and talent shortage continues to widen at an alarming rate[77]: 52 percent of public organizations state that a lack of resources and skills is their biggest challenge when designing for cyber resilience; half of the smallest organizations by revenue say they either do not have or are unsure as to whether they have the skills they need to meet their cyber objectives; and only 15 percent of all organizations are optimistic that cyber skills and education will significantly improve in the next two years.

75 INTERNATIONAL TELECOMMUNICATIONS UNION - ITU. **Global Connectivity Report 2022**. 2022.

76 WORLD ECONOMIC FORUM. **The Global Risks Report**. 2022.

77 WORLD ECONOMIC FORUM. **Global Cybersecurity Outlook 2024**. 2024.

To address this cyber-skill and talent shortage, the G20 should encourage the creation and expansion of specialized programs that target the different experience and age groups, such as:

- **National cyber academies:** Specialized educational institutions established by governments or other organizations to provide comprehensive and focused cybersecurity education and training. Through a combination of theoretical instruction, hands-on training, and practical exercises, students in these academies gain the necessary expertise in various aspects of cybersecurity.
- **Youth cyber education pathways:** Initiatives aimed at engaging and educating young people in the field of cybersecurity from an early age. These programs target students in primary and secondary schools, as well as those in higher education, with the goal of developing their interest, skills, and understanding of cybersecurity concepts. By providing age-appropriate learning resources, hands-on activities, mentorship opportunities, and exposure to cybersecurity careers, these pathways help to create a pipeline of future cybersecurity professionals.
- **Board-of-directors-level cyber education:** Programs and training initiatives specifically designed for members of an organization's leadership team. These programs aim to equip leaders with a solid understanding of cybersecurity risks, the potential impact on the organization, and their responsibilities in overseeing and guiding the organization's cybersecurity strategy.

Policy Action 2.2

Make progress on Data Free Flow with Trust by building on prior consensus while tailoring the approach to the G20 members to enable innovation, economic growth, and social well-being while building trust on a global scale.

Executive Summary

To achieve this goal, the G20 should:

- Establish an international institutional mechanism to ensure interoperable data-sharing frameworks, standards, and protocols.
- Support developing countries to implement robust data governance regulations, aligned with the Data Free Flow with Trust principles, by sharing best practices and frameworks.
- Provide global businesses with practical tools to mitigate the risk and cost of moving data across borders, such as recommended contractual clauses for cross-border data transfers, privacy-enhancing technologies (PETs), and data marketplaces.
- Build awareness and empower individuals to understand how their data is collected and used, as well as their rights to control what is shared and stored.

Background and Context

Data Free Flow with Trust (DFFT) aims to strike a balance between allowing data to move seamlessly across borders and ensuring trust on a global scale, unlocking innovation and economic development while addressing data privacy and protection concerns. Having received significant traction in recent years (see context section for more details on recent advances), DFFT can be further developed with the support of the G20.

The G20 should establish an international institutional mechanism to ensure interoperable data-sharing frameworks, standards, and protocols

The foundation for building Data Free Flow with Trust among G20 countries lies in establishing a robust institutional mechanism with clear governance, defined processes, and committees to lead this work internationally. Working groups composed of government officials, experts, representatives of the business community, and other stakeholders should be created to discuss challenges, share knowledge, and provide inputs for the committee's decision-making.

Goals should include ensuring interoperable data-sharing frameworks and standards that incorporate a combination of domestic and international measures, aligning on criteria for the classification and segregation of data, setting approval and consent requirements, and supporting their reinforcement across jurisdictions.

The industry must be a central component of these discussions, given that businesses are the primary generators and users of data. Industry involvement ensures that policies are grounded in practical, real-world applications, enhancing their effectiveness and facilitating broader adoption. Recent developments, such as the G7's Institutional Arrangement for Partnership (IAP), provide a framework to advance DFFT (Box 2.2). By actively engaging the industry in the operationalization of DFFT through frameworks like the IAP, G20 countries can create a secure, transparent, and efficient environment for cross-border data flow, ultimately driving global innovation and economic prosperity.

Box 2.2: G7's Institutional Arrangement for Partnership (IAP)

At G7 Hiroshima 2023, the G7 leaders endorsed the establishment of an Institutional Arrangement for Partnership (IAP) to lead international efforts toward the operationalization of DFFT. According to the Digital and Tech Ministers' Declaration, the IAP will "bring governments and stakeholders together to operationalize DFFT through principles-based, solutions-oriented, evidence-based, multistakeholder, and cross-sectoral cooperation."

G7 leaders considered that the attributes of the OECD and its existing work make it well-suited to advance this effort and proposed the following approach for IAP's structure:

- "Utilize existing committee/organs of international organization (where decision-making of member countries for data/digital policies takes place) to facilitate multilateral policy making and coordination. The secretariat is established at the OECD, where the IAP is hosted.
- Establish WG (working groups) based on projects composed of government officials, experts and stakeholders under such committee. This WG are meant to discuss, develop, and provide expert input for the committee's policy making and coordination, addressing questions and issues regarding cross boarder data flow.
- Each WG could collaborate with and bring various international organizations and institutions as the participants of joint projects. WGs are expected to provide common solutions for each member of the OECD and those partner international organizations on each project."

Source: Digital Agency, Government of Japan

The G20 should support developing countries to implement robust data governance regulations, aligned with the Data Free Flow with Trust principles, by sharing best practices and frameworks

While a significant number of countries have implemented data governance legislation—over 130 according to UNCTAD[78]—there remains a gap within the G20 itself, with some developing nations still lacking robust data protection and privacy legislation. By supporting those developing countries in establishing robust data governance frameworks aligned with DFFT principles, the G20 can create a more level playing field and unlock the full potential of data-driven innovation for all members.

To achieve that, G20 members should promote knowledge sharing and equip developing countries with resources to help them implement robust data governance regulations. This could include frameworks, case studies, training programs, and technical assistance tailored to their specific needs.

The G20 should provide global businesses with practical tools to mitigate the risk and cost of moving data across borders, such as recommended contractual clauses for cross-border data transfers, privacy-enhancing technologies (PETs), and data marketplaces

Along with regulatory mechanisms, countries can leverage technological, legal, and other tools to help organizations safely streamline cross-border data flows[79], such as:

- **Model or standard contractual clauses for cross-border data flow:** Recommended or mandatory clauses that ensure the lawful transfer of data between entities across border. Examples are "Standard Contractual Clauses" for data transfers between EU and non-EU

78 UN TRADE AND DEVELOPMENT - UNCTAD. **Data Protection and Privacy Legislation Worldwide**. Available at: https://unctad.org/page/data-protection-and-privacy-legislation-worldwide. Accessed in: 05 jan. 2024.

79 OECD. **Fostering cross-border data flows with trust**. 2022.

countries[80] and "ASEAN Model Contractual Clauses for Cross-Border Data Transfers" for data transfers between ASEAN nations[81].

- **Data marketplaces:** Sometimes known as data exchanges, these are online platforms that facilitate the buying and selling of data. Operated by neutral service providers, these platforms provide traceability, security, and compliance with regulations. Additionally, allow service providers to share their expertise and assist organizations with specialized data-related knowledge.
- **Privacy-enhancing technologies (PETs):** "Emerging set of technologies and approaches that tenable the derivation of useful results from data without providing full access to the data"[82]. Comprising multiple possible techniques (e.g., differential privacy, federated analysis, zero-knowledge proofs)83, PETs have the potential to reduce the risks of data sharing during collaboration between organizations, fostering trust and motivating new partnerships.
- **Repository of cross-border data transfer regulations:** Centralized repository of national and international data regulations created to improve transparency and facilitate compliance for the private sector by allowing uses to explore, track, and analyze the different regulatory approaches[84].

The G20 members should actively encourage the development and adoption of these technological tools to complement the regulatory efforts toward Data Free Flow with Trust by providing targeted support for research and development initiatives, establishing collaborative innovation hubs, and promoting public-private partnerships focused on these technologies. Additionally, G20 members can implement regulatory sandboxes to facilitate the testing and deployment of these tools in controlled environments, while also fostering capacity-building programs to equip stakeholders with the necessary skills and knowledge for their effective utilization.

The G20 should build awareness and empower individuals to understand how their data is collected and used, as well as their rights to control what is shared and stored

As previously described, the digital age has led to an exponential increase in the amount of personal data collected and stored by organizations. This data, encompassing everything from online activity to financial transactions, is often gathered without individuals fully understanding the scope or implications of its use. Additionally, the landscape of data privacy regulations is becoming increasingly complex, with various national and regional laws emerging, further hindering individuals' understanding of their rights regarding the collection, storage, and use of their personal data.

To address this growing concern, G20 members should build widespread awareness and empower individuals to understand their data privacy and protection rights. This can be achieved through public education campaigns that utilize various channels (e.g., social media, traditional media, educational institutions) to inform individuals about the types of data collected by companies, the potential uses of this data, and their rights to control its collection, storage, and sharing.

Additionally, governments can also collaborate with organizations to ensure greater transparency. This can involve requiring platforms to highlight the types of data collected, its intended use, and the individual's rights regarding data control, storage, and deletion.

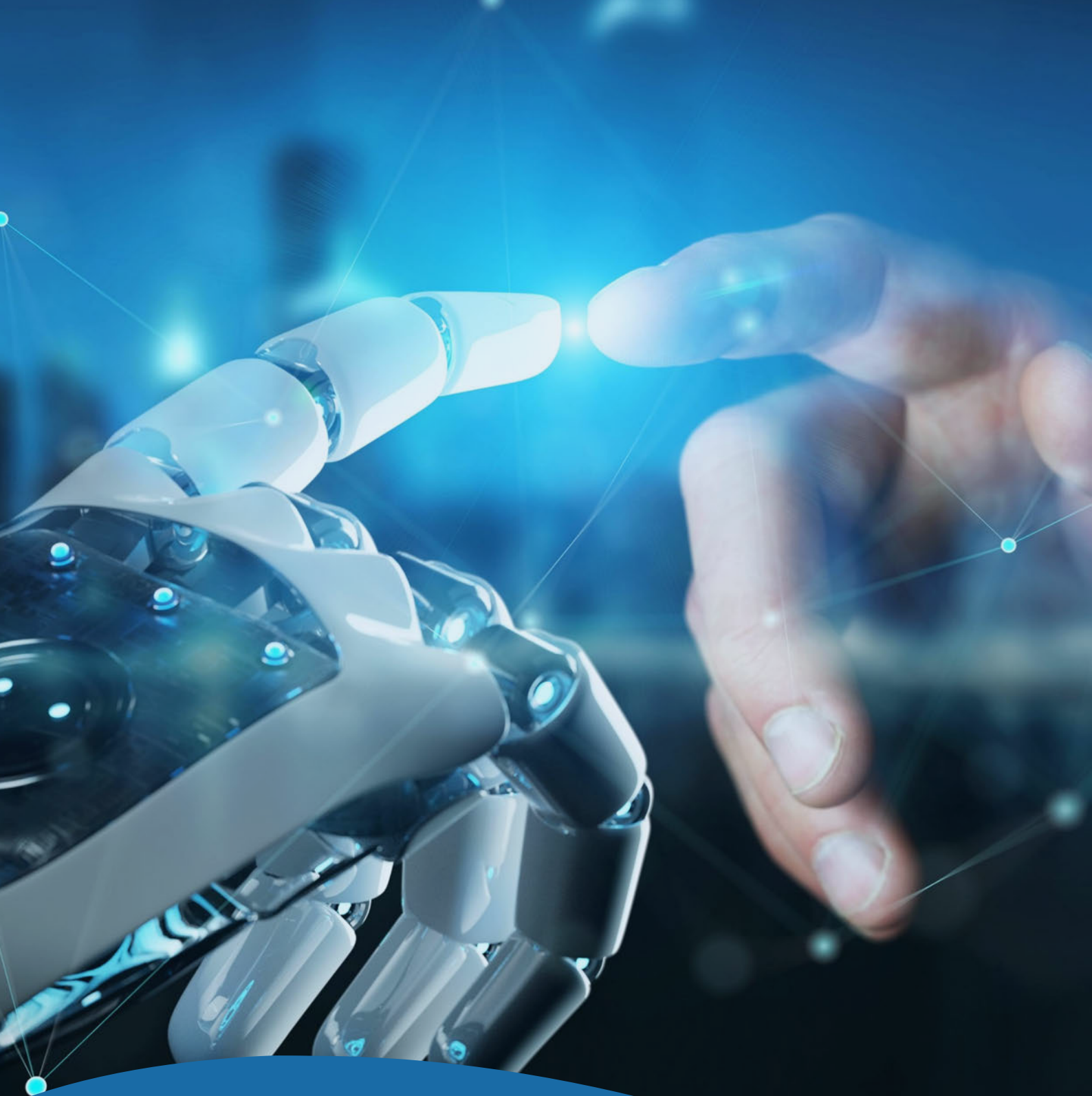
80 EUROPEAN COMMISSION. **Standard Contractual Clauses (SCC)**. 2021.

81 ASSOCIATION OF SOUTHEAST ASIAN NATIONS. **ASEAN model contractual clauses for cross border data flows**. 2021.

82 THE ROYAL SOCIETY. **From privacy to partnership**. 2023.

83 OECD. **Fostering cross-border data flows with trust**. 2022.

84 OECD. **Fostering cross-border data flows with trust**. 2022.



RECOMMENDATION 3

Recommendation 3

New recommendation and topic was not covered in previous B20 editions

Responsibly harness the transformative power of artificial intelligence by supporting its development and adoption while collaborating to achieve a shared ambition and common principles for ethics, sustainability, security, and inclusion.

Policy Actions

Policy Action 3.1 – Strengthen international collaboration and scale up frameworks grounded on a risk-based, pro-innovation approach for responsible AI development, deployment, and governance to keep pace with the rapidly evolving technology and regulatory landscape.

Key Performance Indicators	Baseline	Target	Classification
Minimum score achieved by a G20 country on the Government AI Readiness Index *Source: Oxford Insights*	Africa: **18** Americas: **50** Asia-Pacific: **61** Europe: **49** (2023)	**70** across regions (2027)	New indicator

SDGs Impacted

Recommendation 3 contributes to the achievement of the following UN's SDGs:

SDG 8: decent work and economic growth, SDG 9: industry innovation and infrastructure, SDG 16: peace justice and strong institution, and SDG 17: partnership for the goals.

More details in Annex A

Relevant B20 Brasil Guiding Claims

Recommendation 3 has the strongest impact on four B20 Brasil Guiding Claims:

- **Increase productivity through innovation**
- **Enhance human capital**
- **Accelerate a fair net-zero transition**
- **Foster the resilience of Global Value Chains**

More details in Annex B

Relevant G20 Brasil Priorities

Recommendation 3 contributes to the priorities of the G20 Brasil **Digital Economy Working Group**, in particular **artificial intelligence for inclusive sustainable development and inequalities reduction.**

Recommendation 3 also supports the priorities of other working group, especially **Research and Innovation, Health, Disaster Risk Reduction, Education, Employment, and Agriculture.**

More details in Annex C

Context

Artificial intelligence (AI) was conceived in the latter half of the twentieth century and has continuously evolved from initial AI systems to increasingly complex and powerful Machine Learning (ML) and Deep Learning (DL) technologies. However, it was the widespread adoption of generative AI (GenAI) applications that led to its recent breakthrough.

The speed of adoption and implementation of AI is unparalleled to any other technological advancement. To illustrate, global funding of GenAI solutions soared from under USD 50 million in 2014 to over USD 10 billion in 2023[85], and as it evolves at an unprecedented pace, it promises to revolutionize societies and economies with its ability to increase productivity and drive innovation.

The transformative power of artificial intelligence is undeniable. With existing and developing use cases across sectors, it promises not only to modernize current practices, but also unlock innovative solutions to some of the world's biggest challenges.

However, unlocking these benefits requires responsible consideration of its implications. The rise of AI has brought forth novel and complex concerns regarding responsibility, ethics, safety, security, and sustainability, posing a significant challenge that requires collaborative action by governments and organizations.

85 CB Insights.

In its *AI Policies for Business* report, the Confederation of Indian Industry (CII) highlights five key areas to consider when analyzing the transformative power of AI (Exhibit 14).

Exhibit 14 | Areas for consideration

Source: CII (2023) AI Policies for Business

Within each of these five areas, both upsides and downsides can be identified. By proactively addressing the potential downsides early on, while AI is still in its early stages, countries can maximize the positive impacts of this technology. This proactive approach will ensure AI serves humanity for the better, promoting ethics, sustainability, and inclusion.

Innovation, productivity and competitiveness

AI's capabilities are not only sparking global fascination, but also driving innovation, productivity, and competitiveness across sectors. Estimates show that AI technology has the potential to raise global GDP by 7 percent over a ten-year period[86]. Existing and developing use cases that help address real-world challenges in key industries include:

- **Healthcare:** AI is revolutionizing drug discovery and synthesis. By analyzing and identifying underlying patterns in vast amounts of data, AI can help identify promising new drug candidates and predict their effectiveness and safety, significantly accelerating the development of new treatments.
- **Education:** AI is enabling enhanced, personalized learning. AI can analyze a student's progress and learning style, and then recommend specific materials and activities to help students learn more effectively and efficiently. Furthermore, the digital nature of AI makes it highly scalable, making it a suitable solution to provide quality education to currently marginalized populations.
- **Communication & connectivity:** AI is powering instant, real-time language translation solutions. These tools can break down language barriers and allow people from all over the world to communicate with each other seamlessly, ultimately fostering greater understanding and collaboration on a global scale.
- **Financial services:** AI is powering enhanced fraud detection and prevention systems. By analyzing financial transactions in real-time, AI improves the identification of suspicious patterns and the prevention of fraudulent activity, protecting consumers and businesses from financial losses.
- **IT & software development:** AI is democratizing access to software programming. With AI assistance, a wider range of people can create software more efficiently and intuitively. This opens doors for less experienced individuals to contribute as programmers and accelerate innovation and productivity.
- **Manufacturing industry:** AI is revolutionizing the manufacturing sector by enhancing predictive maintenance, process optimization through simulation, quality control, design innovation, and workforce training.

86 GOLDMAN SACHS. **Generative AI could raise global GDP by 7%**. 2023.

While the transformative power of AI is undeniable, it must also be inclusive. If the benefits of AI are concentrated in the hands of a few individuals, companies, or countries, it might exacerbate existing inequalities. From a global perspective, the WEF highlights four (non-exhaustive) sources of global disparities and exclusion[87]:

- **Infrastructure:** Developing, training, and maintaining generative AI systems requires extensive computing and cloud infrastructure, which is often beyond the reach of developing counties or smaller companies
- **Data:** The outputs generated by a generative AI system are heavily influenced by the data sets it is trained on, which often underrepresent marginalized countries or demographic groups.
- **Talent:** The educational and mentorship opportunities needed to create cutting-edge technologies like generative AI are often out of reach for students in underprivileged countries.
- **Governance:** Limited financial, political, and technical resources hinder the ability of many countries to develop robust AI governance policies.

Data governance and privacy

AI's ability to identify patterns and extract insights from data exceeds that of any previous technology. By analyzing what would otherwise be overwhelming amounts of data, AI applications uncover hidden connections and present new opportunities to increase productivity, accelerate innovation, and tackle complex challenges in key areas such as healthcare, education, and climate change.

Typically, the more data an AI system is trained on, the better it performs. This creates a tension between reducing restrictions on data use to unlock innovation and protecting data privacy and intellectual property rights.

On one hand, data used in AI training may contain personal information, such as search queries, browsing history, or social media interactions, and require ensuring user privacy, protection, and when applicable, consent. Ownership of intellectual property is also a key factor to consider, as generative AI is typically trained on existing resources and uses patterns identified in those resources to create new ideas and materials.

On the other hand, data is the lifeblood of AI, and restrictions on its use can hinder development and innovation. With the rise of data privacy regulations around the world, limitations are being placed on how data can be collected, stored, and transferred. Governments must now collaborate to safely streamline data flow and unlock AI's potential (for further information on this topic, refer to Policy Action 2.2).

Striking a balance between ensuring data privacy and intellectual property rights and fostering a healthy environment for AI development is a critical challenge in the years to come.

Workforce dynamics and skills development

AI is rapidly transforming workforce dynamics, prompting a shift in the skills required to thrive in the modern workplace, and generating entirely new opportunities. On the technical side, numerous jobs are anticipated to emerge in areas related to AI and associated technologies. In other fields, the focus is likely to shift toward a more human-centric approach, resulting in a growing demand for critical thinking, problem-solving, creativity, and communication. The ability to collaborate effectively with AI systems and translate data into actionable insights will be crucial.

From a different perspective, advanced AI systems are likely to automate many tasks that are currently performed by humans. While positive in terms of efficiency and productivity, this tends to result in job displacement for workers. Unlike past automation, which often replaced repetitive manual tasks, AI's

87 WORLD ECONOMIC FORUM. **AI Governance Alliance Briefing Paper Series**. 2024.

capacity to learn, innovate, make informed decisions, and simulate human behavior tends to extend its impact to cognitive functions, creative problem-solving, and even social interaction—areas previously considered uniquely human. Estimates show that AI systems could expose the equivalent of 300 million full-time jobs to some degree of automation[88].

To ensure the global workforce is ready for the future shaped by AI and automation, it is essential to prioritize and invest in skilling and reskilling initiatives. These programs will empower individuals with the necessary technical and soft skills to navigate the evolving job landscape, adapt to emerging technologies, and maintain their competitiveness in the market.

Social good, regulatory compliance and accountability

AI's ability to analyze and process vast amounts of information and provide intelligent solutions unlocks possibilities to address global challenges, foster sustainable development, and elevate social good. With its use cases across essential sectors such as healthcare, education, and climate change, AI is an asset for achieving the UN's Sustainable Development Goals.

Nevertheless, governments and organizations must consider the associated risks and create policies to ensure responsible AI systems and applications. Concerns related to the development and use of AI technology include:

- **Security and safety against misuse:** As AI becomes more advanced and autonomous, the risk of creating systems that pursue undesirable goals grows. The likelihood of AI systems responding to deliberately or accidentally embedded harmful objectives increases as they become more complex, especially if developers prioritize speed over thorough (and often costly) testing[89].
- **Avoidance of bias:** AI bias is a growing concern as intelligent systems increasingly support organizations and individuals in making decisions. Biases can creep into AI algorithms at various stages, from the data used to train them to the way they are programmed, and if not properly identified and addressed can lead to discriminatory outcomes.
- **Transparency and accountability:** The nondeterministic behavior of AI systems and algorithms often poses challenges in assigning responsibility when errors occur. It is often challenging to understand the reasoning behind specific decisions or pinpoint the source of a mistake. This problem becomes even more complex when multiple parties, such as data providers, model developers, and end users, are involved in the development and utilization of AI systems.
- **Trustworthiness of AI outputs:** A consequence of generative AI's capacity to innovate and create new content is the risk of producing factually inaccurate information, also known as hallucinations, and propagating misinformation. This can lead to confusion, mistrust, and even potential harm, particularly when AI models are used to influence decision-making.

Sustainability, environment and climate change

There is a strong connection between AI and sustainability, and discussions highlight both opportunities and concerns.

On one hand, AI is emerging as a powerful tool to mitigate environmental impact and climate change. Related existing and developing use cases include:

- **Enhanced climate models:** AI's ability to identify complex patterns makes it a powerful tool for developing more accurate and sophisticated climate models. These models can help researchers better understand the complex factors that influence climate change and predict its future impacts, enabling more informed decisions about mitigating climate change.

88 GOLDMAN SACHS. **Generative AI could raise global GDP by 7%**. 2023.

89 BENGIO, Y.; HINTON, G.; YAO, A. et al. **Managing AI risks in an era of rapid progress**. 2023.

- **Process optimization:** By processing large volumes of data, AI systems can identify patterns and trends in complex processes to optimize resource management. For instance, AI can optimize energy usage in buildings, streamline transportation systems to reduce emissions, and enable smart agriculture practices to minimize water and fertilizer consumption.

On the other hand, AI's power-hungry systems, particularly during training and fine-tuning, are raising concerns about direct energy consumption, carbon emissions from nonrenewable sources, and freshwater consumption for cooling.

While global data center energy consumption remained relatively flat for nearly a decade, it is now experiencing a rapid increase. Despite a sixfold increase in data center capacity between 2010 and 2018, energy demand only grew by 6% (194 TWh to 204 TWh) due to significant improvements in energy efficiency. However, by 2022, global data center electricity consumption had jumped to 460 TWh and is projected to reach between 620 TWh and 1,050 TWh by 2026[90]. Although this surge is driven by multiple technologies, including cryptocurrencies, and cloud computing, AI is expected to be a major contributor. Forecasts suggest the AI industry's electricity consumption will be more than ten times higher in 2026 compared to 2023[91].

One of the challenges related to this extra demand is the fact that in many locations, the consistent power needs of data centers are currently only met by fossil fuel generation sources, especially natural gas. Renewable sources' supply curves struggle to match the 24/7 demand profile of data centers, and fulfilling this demand with renewables would require an investment in generation and storage capacity that is impractical at this stage[92].

In this context, addressing AI's environmental impact becomes a crucial aspect of responsible development and scaling of the technology, and multiple companies are taking proactive steps to minimize their footprint. This includes optimizing software and hardware to maximize energy efficiency, utilizing renewable energy sources to power training processes, developing liquid cooling solutions, and even leveraging AI itself to accelerate innovations in sustainable technology. Nevertheless, a sustainable scaling of AI technologies will require a significant ramp-up in these initiatives, with more companies actively committed.

Global mobilization

AI is rapidly evolving, and with its immense potential comes a focus on ensuring its development and use are responsible. To address this, there is a global movement toward responsible AI practices. Recent initiatives in this area include:

- **OECD AI Principles:** Considered the first international AI policy framework, the OECD AI Principles were issued in 2019 and endorsed by 42 nations and by the G20 meeting. The purpose of these principles is to "promote use of AI that is innovative and trustworthy and that respects human rights and democratic values." In addition, the OECD has also launched the AI Incidents Monitor (AIM) to document AI incidents and help policymakers, practitioners, and other stakeholders gain insights into the incidents and hazards that concretize AI risks[93].
- **United Nations' resolution on AI:** In March 2024, the UN General Assembly adopted a landmark resolution on the promotion of "safe, secure and trustworthy" artificial intelligence (AI) systems. Backed by more than 120 member states, the text recognizes AI systems' potential to accelerate and enable progress toward reaching the 17 Sustainable Development Goals94.

90 MASSACHUSETTS INSTITUTE OF TECHNOLOGY - MIT. **The Climate and Sustainability Implications of Generative AI**. 2024.

91 INTERNATIONAL ENERGY AGENCY - IEA. **Electricity 2024**: analysis and forecast to 2026. 2024.

92 BAIN & COMPANY. **How to Feed AI's Hunger for Power**. 2024.

93 OECD. **OECD AI Principles overview**. Available at: https://oecd.ai/en/ai-principles. Accessed in: 05 jan. 2024.

94 UNITED NATIONS. **Seizing the opportunities of safe, secure and trustworthy artificial intelligence systems for sustainable development**. 2024.

- **The UNESCO Recommendation on the Ethics of Artificial Intelligence:** Adopted by all 193 UNESCO member states in November 2021, it lays out a framework in 10 principles for the ethical development and use of AI, centered around four core values: human rights and human dignity; living in peaceful, just and interconnected societies; ensuring diversity and inclusiveness; and environment and ecosystem flourishing[95].
- **The World Economic Forum's AI Governance Alliance (AIGA):** Launched in June 2023, the WEF's AIGA fosters multistakeholder dialogue (industry leaders, governments, academic institutions, and civil society organizations) to advocate for the responsible global design and release of transparent and inclusive AI systems. It is composed of three core workstreams—Safe Systems and Technologies, Responsible Applications and Transformation, and Resilient Governance and Regulation–and brings together more than 300 members from over 260 organizations across six continents[96].
- **The World Economic Forum's Presidio Recommendations on Responsible Generative AI:** In April 2023, the "Responsible AI Leadership: A Global Summit on Generative AI" took place, bringing together over 100 AI thought leaders and practitioners, including chief scientific officers, responsible AI and ethics leads, academic leaders, AI entrepreneurs, policymakers, tech investors, and members of civil society. The summit's key output was a set of 30 recommendations, the "Presidio Recommendations on Responsible Generative AI," covering responsible development and release of AI, open innovation and international collaboration, and social progress.
- **ITU's AI for Good:** In May 2024, the first AI for Good Summit took place in Geneva, organized by the ITU in partnership with 40 other United Nations organizations. The goal was to promote multistakeholder dialogue to explore practical applications of AI that could advance the Sustainable Development Goals (SDGs) and scale those solutions for global impact.

95 UNESCO. **Recommendation on the Ethics of Artificial Intelligence**. 2022.

96 WORLD ECONOMIC FORUM. **AI Governance Alliance**. Available at: https://initiatives.weforum.org/ai-governance-alliance/home. Accessed in: 05 jan. 2024.

Policy Action 3.1

Strengthen international collaboration and scale up frameworks grounded on a risk-based, pro-innovation approach for responsible AI development, deployment, and governance to keep pace with the rapidly evolving technology and regulatory landscape.

Executive Summary

To achieve this goal, the G20 should:

- Pursue global convergence and jurisdictional interoperability, including common AI terminology and principles, and build on existing frameworks to establish a shared set of risk-based and evidence-based standards for ethical, sustainable, and inclusive AI.
- Establish national and international AI innovation clusters and ecosystems that encourage collaboration between businesses, research institutions, start-ups, and government agencies, enabling organizations to advance their AI capabilities while supporting government agencies in maintaining an up-to-date regulatory environment.

Background and Context

The G20 can shape the global landscape of artificial intelligence (AI) by supporting the development of key enablers across its member countries. These enablers are the foundational elements that will unlock the transformative potential of AI and ensure its responsible integration into society, and include:

- **Infrastructure:** The data-hungry nature of AI relies on the deployment of robust and modern infrastructure. Computing power is necessary for AI systems to process vast amounts of data and run complex algorithms; high-speed, reliable connectivity enables real-time data access and collaboration; cloud services provide scalable, cost-effective computing resources for widespread AI adoption.
- **Data:** Good quality shared data is essential to develop socially responsive AI[97]. AI systems learn and improve by analyzing vast amounts of data, identifying patterns and relationships. The quality and quantity of data directly impacts the effectiveness of AI models.
- **Talent and skills:** Human expertise is crucial for AI development and adoption. On the development side, skilled researchers, engineers, and data scientists are essential to design, build, and manage AI systems effectively. On the adoption side, a skilled AI workforce is essential to implementing AI solutions in their industries to drive innovation, efficiency, and economic growth. On both sides, knowledge of the associated risks is required for the responsible advance of AI technology.

97 EUROPEAN COMMISSION. **AI Enablers. European Commission**. Available at: https://ai-watch.ec.europa.eu/topics/ai-enablers_en. Accessed in: 05 jan. 2024.

- **Governance and standards:** AI governance and standards are essential to ensure responsible development and foster trust in AI technology. They mitigate risks and promote innovation and growth by providing a common ground for all stakeholders. International compatibility of these standards is crucial to enable global collaboration and a unified approach to responsible AI.
- **Clusters and ecosystems:** Navigating AI's complexities can be a challenge, especially for small businesses and developing economies. AI clusters and ecosystems play a vital role in providing resources, knowledge, and collaboration opportunities. By connecting with researchers, start-ups, corporations, and government agencies, businesses can access the support needed to develop and implement effective AI solutions.

Infrastructure, data, and talent have been covered in Recommendations 1 and 2. The actions below will focus on governance, standards, clusters, and ecosystems.

The G20 should pursue global convergence and jurisdictional interoperability, including common AI terminology and principles, and build on existing frameworks to establish a shared set of risk-based and evidence-based standards for ethical, sustainable, and inclusive AI

Despite the widespread popularity of AI and ongoing discussions across businesses and organizations, the field still suffers from a lack of universally agreed upon definitions. WEF's AI Governance Alliance highlights ambiguity and lack of common understanding of safety, risks, and general safety measures as a key challenge[98].

This lack of common understanding extends to principles and standards. The growing interest in responsible AI has led to multiple organizations proposing their own sets of frameworks for the ethical development and deployment of AI technologies. While this proliferation of ideas is valuable from a knowledge and innovation standpoint, it can also result in fragmentation that hinders interoperability and the establishment of universally accepted guidelines.

As AI technologies continue to expand across various sectors and industries and initial principles evolve into regulations (Box 3.1), international cooperation becomes essential to prevent a fracturing of the global AI governance environment into non-interoperable spheres with prohibitive complexity and compliance costs[99].

In this context, G20 members should foster jurisdictional interoperability by promoting international collaboration for compatible frameworks. These frameworks must consider perspectives from all stakeholders, including government, public and private sectors, academia, and civil society, to ensure a comprehensive understanding of the key issues and the effectiveness of potential regulatory responses. Additionally, frameworks should be flexible to adapt to the fast-evolving capabilities of AI and grounded on a risk-based approach to effectively balance innovation, sustainability, and safety.

A comprehensive approach must encompass AI's environmental footprint. The ever-growing energy demands of training and running complex AI models strain data centers, often relying heavily on non-renewable sources. Frameworks should establish guidelines for sustainable AI development and implementation, including promoting techniques that improve model efficiency and exploring the use of renewable energy sources for data center operations.

To improve communication among stakeholders and facilitate this international effort, G20 members should also establish a common, precise terminology and encourage its widespread adoption by all parts. We call on the G20 to build on existing initiatives, such as the ones presented in the global mobilization section of this recommendation (page 49) and endorsed by international organizations (e.g., UN, UNESCO, OECD).

98 WORLD ECONOMIC FORUM. **AI Governance Alliance Briefing Paper Series**. 2024.
99 WORLD ECONOMIC FORUM. **AI Governance Alliance Briefing Paper Series**. 2024.

Box 3.1: EU's AI Act

The AI Act is the first major piece of AI legislation globally, expected to be passed into law in early 2024 and to take effect by 2026.

It takes a "risk-based" or "horizontal" approach, where AI is subject to various requirements depending on the level of risk associated with the use case:

- **"Unacceptable risk"** applications and systems (e.g., social scoring systems, manipulative AI) are altogether prohibited.
- **"High risk"** use cases undergo stricter requirements, such as risk management obligations, data quality and governance standards, technical documentation, and human oversight. This category encompasses:
  - o AI used for safety or in safety-regulated products.
  - o Any AI that presents risk to health, safety, rights, or public interest.
  - o AI used in explicitly enumerated "high risk" use cases (e.g., governing access to private or public services, such as bank loans).
- **"Limited risk"** systems, which have a risk of manipulation or deceit (e.g., chatbots), are subject to lighter transparency obligations (e.g., developers and deployers must ensure that the end-uses are aware that they are interacting with AI).
- **"Minimal risk"** applications (e.g., AI-enabled spam filter or video games) can be deployed with no restrictions.

Two categories are excluded from the AI Act:

- Open-sourced AI that is not "unacceptable risk" or "high risk" and is not monetized.
- AI that is used exclusively for research purposes.

Source: European Parliament, EU Artificial Intelligence Act

The G20 should establish national and international AI innovation clusters and ecosystems that encourage collaboration between businesses, research institutions, start-ups, and government agencies, enabling organizations to advance their AI capabilities while supporting government agencies in maintaining an up-to-date regulatory environment

Given the complexity and constantly evolving nature of AI, navigating its potential can be challenging, particularly for smaller businesses and those operating in developing economies. In this context, AI innovation clusters and ecosystems become an asset. These collaborative environments offer a wealth of resources—from shared knowledge and mentorship opportunities to regulatory sandboxes—that can empower all players to harness the power of AI. By plugging into a network of established researchers, start-ups, larger corporations, and government agencies, these businesses gain access to the guidance and support needed to develop and implement AI solutions tailored to their specific needs and resource constraints.

Furthermore, AI innovation ecosystems can serve as a vital feedback channel, streamlining communication between stakeholders and government agencies. This ensures that diverse AI-related needs are considered, regulations are reviewed and updated promptly, and the necessary regulatory agility is achieved to keep pace with the fast-evolving technology landscape.

Therefore, G20 members should encourage national and international AI innovation clusters and ecosystems. To jumpstart it, G20 members should:

- **Identify strategic locations:** Identify regions with existing strengths in AI research, technology, and/or talent to become hubs for cluster development.
- **Develop enabling infrastructure:** Promote public and private investment in affordable computing facilities, data centers, and connectivity to support the intensive computational needs of AI research.

- **Develop data ecosystems:** Encourage the development of data ecosystems with a broad information-sharing architecture to connect public and private entities, enabling the National State to digitize public services and the private sector to develop new products, services, and strategies.
- **Develop talent:** Develop joint educational programs with universities and research institutions to create a skilled AI workforce.
- **Facilitate knowledge sharing:** Organize workshops, conferences, and mentorship programs to encourage collaboration and knowledge exchange among stakeholders.
- **Provide regulatory sandboxes:** Directly address the challenge of balancing innovation with responsible development by allowing for controlled experimentation within a defined regulatory framework.
- **Promote funding:** Facilitate public and private funding through supportive regulations, public-private partnerships, tax incentives, and/or direct government investment in the AI ecosystem.
- **Provide supporting resources:** Empower participants to develop skills and knowledge by providing resources like AI maturity assessment tools and targeted training materials.

ANNEXES

Annex A – SDGs

Recommendation 1

Recommendation 1 contributes to the achievement of UN's SDG 4: quality education, SDG 5: gender equality, SDG 8: decent work and economic growth, SDG 9: industry innovation and infrastructure, SDG 10: reduced inequalities, and SDG 17: partnership for the goals. The remaining SDGs may be positively impacted as digital technology empowers solutions across various sectors.

Policy action 1.1 contributes to better work standards and economic growth by solving connectivity issues across geographies. Improving connection quality has a positive impact on GDP, contributing to target **8.1** *(sustain per capita economic growth)* and **8.2** *(technological upgrading and innovation)*. Fostering technological empowerment and connectivity development supports the accomplishment of SDG 9, specifically **9.b** *(technology development, research, and innovation)* and **9.c** *(access to ICT and affordable access to Internet)*. It also directly ties to indicator **9.c.1** *(proportion of population covered by mobile network)*. Improving Internet coverage and affordability would benefit indicator **17.6.1** *(fixed Internet broadband subscriptions over 100 inhabitants by speed)* as well as indicator **17.8.1** *(proportion of individuals using Internet)*. By granting the same level of connectivity across demographic groups and reducing inequalities in technology access, it also benefits target **10.1** *(sustaining income growth of the bottom 40 percent of the population)* and target **10.3** *(ensure equal opportunity and reduce inequalities of outcome)*.

Policy action 1.2 aims at reducing the current digital skills gaps, contributing to the achievement of target **4.4** *(skills including technical and vocational skills, for employment, decent jobs, and entrepreneurship)*, measured by **4.4.1** *(proportion of youth and adults with information and communications technology (ICT) skills, by type of skill)*. Ensuring the creation of a competent digital workforce supports the achievement of targets **8.5** *(full and productive employment and decent work for all women and men)*. Policy action 1.2 calls for the urgency of ensuring equal access to digital and technology trainings to all, covering target **5.b** *(use of enabling technology, in particular ICT, to promote the empowerment of women)* and target **10.2** *(social, economic, and political inclusion of all)*. By bridging digital skills gaps, it also benefits indicator **17.8.1** *(proportion of individuals using the Internet)*.

Policy action 1.3 contributes to target **9.3** *(access of small-scale industrial and other enterprises to financial services)*, given the recommendation's focus on sustainable financing, and target **9.2** *(inclusive and sustainable industrialization)* given the relevance for the potential of MSMEs to drive economic growth. There is also significant overlap with targets from SDG 8: target **8.3** *(productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of MSMEs, including through access to financial services)* and target **8.10** *(access to banking, insurance, and financial services for all)*. By supporting the development of women-led MSMEs, it also benefits target **5.5** *(women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic, and public life)*.

Recommendation 2

Recommendation 2 contributes to the achievement of UN's SDG 8: decent work and economic growth, SDG 9: industry innovation and infrastructure, SDG 16: peace justice and strong institution, and SDG 17: partnership for the goals.

Policy Action 2.1 aims at improving global cyber resilience of infrastructure and businesses, contributing to target **9.1** *(quality, reliable, sustainable and resilient infrastructure)*, target **8.1** *(sustain per capita economic growth)*, and target **8.2** *(economic productivity through diversification, technological upgrading and innovation)*. By addressing the cybersecurity skills gap, it also contributes to target **4.4** *(skills including technical and vocational skills, for employment, decent jobs, and entrepreneurship)*. Policy Action 2.1 also calls for international cooperation for cyber action, contributing to target **16.3** *(rule of law at the national and international levels)* and target **17.16** *(global partnership for sustainable development)*. Finally, by building digital trust, it also ties to indicator **17.8.1** *(proportion of individuals using Internet)*.

Policy action 2.2 aims at unlocking innovation and economic growth by fostering safe data sharing, contributing to target **8.1** *(sustain per capita economic growth)*, target **8.2** *(economic productivity through diversification, technological upgrading and innovation)*, target **9.5** *(enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries)*, and target **9.b** *(domestic technology development, research and innovation)*. Moreover, by reinforcing the security and trust aspects, it contributes to target **16.3** *(rule of law at the national and international levels)* and target **17.16** *(global partnership for sustainable development)*.

Recommendation 3

Recommendation 3 contributes to the achievement of UN's SDG 8: decent work and economic growth, SDG 9: industry innovation and infrastructure, SDG 16: peace justice and strong institution, and SDG 17: partnership for the goals.

Policy action 3.1 aims at promoting international convergence around responsible AI frameworks, contributing to target **17.16** *(Global Partnership for Sustainable Development)*, target **16.6** *(effective, accountable and transparent institutions)*, and target **16.7** *(responsive, inclusive, participatory and representative decision-making)*. By unlocking AI's potential to drive innovation and economic growth, policy action 3.1 contributes to target **8.1** *(sustain per capita economic growth)*, target **8.2** *(economic productivity through diversification, technological upgrading and innovation)*, target **9.5** *(enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries)*, and target **9.b** *(domestic technology development, research and innovation)*.

Annex B – Relevant B20 Brasil Guiding Claims

Recommendation 1

Recommendation 1 has the strongest impact on three B20 Brasil Guiding Claims:

- **Increase productivity through innovation:** Connectivity enables access to cutting-edge technologies, fostering innovation and productivity across sectors. Moreover, given their critical role in the global economy and the persistent digital divide, supporting MSMEs in their journey to digitalization (policy action 1.3) accelerates this process even further.
- **Enhance human capital:** Addressing digital skills gaps (policy action 1.2) directly enhances the human capital by equipping individuals with critical skills needed for the modern economy. Moreover, meaningful connectivity provides access to educational resources, online courses, and professional development opportunities, enhancing human capital.
- **Foster the resilience of global value chains:** Resilient ICT infrastructure (policy action 1.1) ensures that businesses can maintain operations and communications during disruptions, enhancing the resilience of global value chains. Digital transformation of MSMEs (policy action 1.3) can enhance their ability to integrate into global value chains, improve supply chain management, and respond effectively to disruptions.

Recommendation 2

Recommendation 2 has the strongest impact on two B20 Brasil Guiding Claims:

- **Foster the resilience of global value chains:** harmonizing cybersecurity and data governance standards and improving multilateral cooperation for cyber action enhances the ability to prevent, respond to, and recover from cyber incidents, thereby maintaining the continuity and resilience of global supply chains.
- **Increase productivity through innovation:** trustworthy digital environments encourage the adoption of new technologies, leading to increased innovation and productivity. DFFT (policy action 2.2) enables seamless and secure data exchange across borders, fostering collaboration and innovation among global businesses and research institutions.

Recommendation 3

Recommendation 3 has the strongest impact on four B20 Brasil Guiding Claims:

- **Increase productivity through innovation:** AI is a powerful tool for driving innovation and productivity across industries. Responsible development and adoption of AI can lead to more efficient processes, new business models, and improved decision-making.
- **Enhance human capital:** AI can augment human capabilities and open up new opportunities for skill development and employment. Moreover, ensuring that AI is developed and adopted responsibly includes mitigating human-related risks such as biased outputs and job displacement.
- **Accelerate fair net zero transition:** AI has the potential to optimize energy use, improve efficiency in various sectors, and develop new sustainable technologies. Moreover, establishing international risk-based frameworks can ensure that the environmental impact of AI technology itself is mitigated.
- **Foster resilience of global value chains:** Responsible use of Artificial Intelligence by various economic agents allows for the optimization of scenario evaluation and decision-making, assisting organizations in reducing existing logistical and operational bottlenecks in the value chain and outlining better responses to unexpected events.

Annex C – Relevant G20 Brasil Priorities

Recommendation 1

Recommendation 1 contributes to the priorities of the G20 Brasil **Digital Economy Working Group**, in particular:

- **Digital inclusion, universal and meaningful connectivity:** recommendation 1 focuses on achieving universal and meaningful connectivity for all individuals and businesses, directly contributing to this priority.
- **Digital government, building a trustworthy and inclusive digital public infrastructure:** policy action 1.1 supports the collaboration between public and private sectors toward the creation of an inclusive and resilient digital infrastructure.

Recommendation 1 also supports the priorities of the **Research and Innovation Working Group** by enhancing innovation capabilities and combating inequalities of access to essential resources through digital technology.

Recommendation 2

Recommendation 2 contributes to the priorities of the G20 Brasil **Digital Economy Working Group**, in particular:

- **Integrity of information online and trust in the digital economy:** multilateral cooperation in cybersecurity enhances the ability to prevent, identify, and contain cyber incidents, thereby maintaining the integrity of online information and boosting trust in the digital economy.

Recommendation 2 also supports the priorities of the **Research and Innovation Working Group** by encouraging the secure and efficient sharing of data necessary for innovation across areas.

Recommendation 3

Recommendation 3 contributes to the priorities of the G20 Brasil **Digital Economy Working Group**, in particular:

- **Artificial intelligence for inclusive sustainable development and inequalities reduction:** responsible AI frameworks and international collaboration ensure that AI technologies are developed and deployed in ways that promote sustainable development and reduce inequalities by addressing ethical, security, and inclusivity concerns.

Recommendation 3 also supports the priorities of other working groups—especially **Research and Innovation, Health, Disaster Risk Reduction, Education, Global Economy, Employment, and Agriculture**—by encouraging AI innovation and adoption across industries with a focus on innovative solutions to global challenges.

Annex D – Composition and Meeting Schedule

Distribution of Members by country

Country	#
Argentina	8
Australia	2
Belgium	4
Brazil	32
Canada	1
China	10
France	9
Germany	11
India	19
Indonesia	1
Italy	9
Japan	5
Korea, Republic of	2
Mexico	1
Poland	1
Russian Federation	8
Saudi Arabia	3
Singapore	1
South Africa	1
Spain	5
Türkiye	3
United Arab Emirates	1
United Kingdom	6
United States	38
Total	**181**

Distribution of Members by gender

Gender	#
Female	75
Male	106

Task Force Chair

Name	Organization	Position	Country
Fernando de Rizzo	Tupy	CEO	Brazil

Task Force Deputy Chair

Name	Organization	Position	Country
Daniel Moraes	Tupy	Innovation and IT Director	Brazil

Task Force Co-Chairs

Name	Organization	Position	Country
Darío Werthein	Vrio Corporation	President	Argentina
Fabio Coelho	Google Brasil	President	Brazil
Fariba Wells	Kyndryl	Vice President Global Government Affairs and Policy	United States
Kate Purchase	Microsoft	Senior Director International AI Governance	United States
K Krithivasan	Tata Consultancy Services	CEO and Managing Director	India
Michael Miebach	Mastercard	CEO	United States
Pablo Roberto Fava	Siemens	CEO	Germany
Rebecca Enonchong	AppsTech and International Chamber of Commerce (ICC)	Founder and CEO (AppsTech)/ Global Executive Board Member (ICC)	United States
Rodrigo Dienstmann	Ericsson Group	President Latam South	Sweden

Task Force PMO

Name	Organization	Country
Cristina Elsner de Faria	National Confederation of Industry	Brazil

Task Force Members

Name	Organization	Position	Country
Abhishek Agrawal	Accion	Managing Partner	United States
Affonso Parga Nina	BRASSCOM (Association of Information and Communication Technology and Digital Technologies Companies)	President of BRASSCOM	Brazil
Afonso Lamounier	SAP	Vice President Government Affairs – Latin America & Caribbean	Germany
Agustin Velazquez	Ava Firm, SC	Managing Partner	Mexico
Ahmet Ussal Sahbaz	Union of Chambers of Commerce of Turkish	Senior Adviser on Technology	Türkiye
Akhilesh Agarwal	The Hi-Tech Gears Ltd.	Associate Vice President - Strategy & Special Projects	India
Alana Rizzo	YouTube	Head of Public Policy YouTube Latam	United States
Alena Profit	AWS	Public Policy Manager	United States
Alessandra Holmo	Swedish Brazilian Research and Innovation Center (CISB)	Managing Director	Brazil
Ali Karami Ruiz	FTI Consulting	Senior Managing Director and Head of Multilateral Engagement	United States
Alix Jagueneau	GSMA	Head of External Affairs	United Kingdom
Ana Luísa Pichinine de Carvalho	CAPEMISA Seguradora	Head of IT	Brazil
Andre Batista	Lenovo	Sr Manager, Government Relations	China
Andressa Marques Theophane Pappas	Motion Picture Association - Brazil	Country Manager & Director of Government Affairs	United States
Andrew King	World Employment Confederation	Public Affairs Manager	Belgium
Andrey Filippov	Digital Economy ANO	Deputy Director	Russian Federation
Andrey Neznamov	Sberbank of Russia	Managing Director of AI Regulation Center	Russian Federation
Andriei Gutierrez	Kyndryl	Director of Global Government Affairs and Policy	United States
Anoushka Marie Marthe Alexandre	Ernst & Young	Strategy, Innovation and Technology Director	United Kingdom
Aparna Balram	Bigsoft Technologies	CEO	India
Apurva Anand	Tata Digital	Revenue Head	India
Arun Karna	AT&T Global Network Services India Pvt. Ltd.	MD & CEO	United States
Ashutosh Chadha	Microsoft India	Direct and Country Head Corporate Affairs and Public Policy India and South Asia	United States
Bernard Spitz	Les Gracques	Chairman BSC and Les Gracques	France

Name	Organization	Position	Country
Bruno Boldrin Bezerra	Johnson & Johnson	Government Affairs and Policy Senior Manager	United States
Bruno Vath Zarpellon	AHK Brasil - Câmara Brasil-Alemanha	Diretor of Innovation and Sustainability	Germany
Candace Johnson	Seraphim Space	Chair of Advisory Board and Partner	United Kingdom
Carlo Linkevieius Pereira	UNGC Brazil Local Netword	CEO	Brazil
Carlos Zarco Alonso	Fundación Espriu	General director	Spain
Carolina Castro	INDUSTRIAS GUIDI	PRESIDENT	Argentina
Chang-beom Kim	The Federation of Korean Industries (FKI)	Vice Chairman and CEO	Republic of Korea
Cheryl Miller	U.S. Council for International Business	Vice President of Digital Policy	United States
Christian Hoffmann	Siemens AG	Head of Geopolitics and International Relations	Germany
Cibele Leite Perillo Ferreira	Amazon Web Services (AWS)	Public Policy Lead	United States
Cristiana Ceccagnoli TIM	TIM S.p.A.	Public Affairs - European Institutional Affairs Officer	Italy
Daniel de Rosa	Sompo Seguros S/A	Executive Director (CIO)	Japan
Daniel Ferrete Pita	Allianz	Head of CEO office - Inv. Director	Germany
Daniel Neves	ANAFIMA - associação Nacional da Indústria da música	Presidente	Brazil
Daniel Pujazón Peña	Banco Santander	Policy Lead - Digital	Spain
Dr Makoto (Mac) YOKOZAWA	Business@OECD/CFIEC Japan	Committee Co-chair	France
Dr Shuktij Singh Rao	Confederation of Indian Industry	Executive Director	India
Dr. Holger Bingmann	ICC Germany e.V.	Chairman	Germany
Edoardo Gisolfi	Confindustria	Presidente	Italy
Eduardo Salido	Amadeus	Senior Advisor Industry & Government Affairs	Spain
Emilio Carlos Rebouças Santana Loures	Intel Semicondutores do Brasil	Government Affairs Manager	United States
Evgeny Melnikov	Russian Union of Industrialists and Entrepreneurs	First Deputy Chairman of RSPP Committee for International Cooperation	Russian Federation
Fabiano Barreto	TikTok	Public Policy Manager	United States
Fabio José S Coelho	Google Brasil	Presidente	Brazil
Francesco Gabriele Lucchese	Intesa Sanpaolo	Head of Trade & Receivable Finance Products	Italy
Francisco Jose Rios Zanotti	SEA Group	Director, Group COO (Latam)	Brazil
Gabriela Gayarre	Aires City	Technology Commitee Founder	Argentina

Name	Organization	Position	Country
Gabriely da Conceição dos Santos	BRASSCOM (Association of Information Technology and Communication (ITC) and Digital Technologies Companies)	Coordinator of Institutional and Government Relations	Brazil
Ganapathi R	Trigyn Technologies Limited	Chairman	India
Guillermo Pivetta	eNotus International Inc.	Managing Director	United States
Gustavo Henrique Bolognesi Donato	"Brasil Digital" Institute	Chairman - "Brasil Digital" Institute; Rector - FEI University; "Impact Economy" Committee Member - MDIC	Brazil
Hana AlSyead	Wujud	Founder & CEO	Saudi Arabia
Heba Sham	Mastercard	Vice President Public Policy	United States
Hellen Harumi Miyamoto	The Brazilian Federation for Private Health Insurance and Plans	Superintendent	Brazil
Henrique Sengès Coutinho Marques	Comitê - CRISTO G20	Advisor	Brazil
Husani Durans de Jesus	Information Technology Industry Council (ITI)	Senior Manager of Policy for the Americas	United States
Isabel Cristina Raupp Pimentel	Interfarma	Government Affairs and Communications Director	Brazil
Javier Alberto Bolzico	ADEBA I ASOCIACION DE BANCOS ARGENTINOS	Ph.D. in Economics	Argentina
Jayme Chataque de Moraes	Santander	Head Ativos Digitais e Blockchain	Spain
Jie Ma	Hikvision do Brasil comércio de equipamento de segurança	President	China
Joao Barroso	Amazon Brazil	Head of Public Policy for Brazil	United States
Jonathan Goudinho	IBM	Government Affairs Executive	United States
Jose Borges Frias Jr.	Siemens Infraestrutura e Indústria	Head of Strategy and Corporate Innovation	Germany
José Goutier Rodrigues	Positivo Tecnologia	Goverment Affair Senior Director	Brazil
Juan Luis Redondo Maillo	TELEFONICA S.A.	Director Digital Public Policies	Spain
Kaike Silveira	Amcham Brasil	Manager for Government Relations	Brazil
Kanta Singh	UN WOMEN INDIA OFFICE	Deputy Representative	United States
Kantikumar Dugar	MediaJade	Chief Ninja / Founder	India
Kate Purchase	Microsoft	Senior Director of Government Affairs	United States
Kerstin Hubmer	Eurochambres	Digital Policy Advisor	Belgium
Koh Nakajima	Keidanren (Japan Business Federation)	Co-Director, Industrial Technology Bureau	Japan
Korshunova Larisa	JSC UTLC ERA	GR Director	Russian Federation
Larissa de Jesus Silva	Brazilian National Confederation of Industry	Communication's Analyst	Brazil
Laura Leka	International Federation of Accountants (IFAC)	Principal	United States

Name	Organization	Position	Country
Lawrence Ng Kian Seng	CrimsonLogic Pte Ltd	CEO	Singapore
Leandro Fonseca Da Silva	Novartis Biociencias SA	Head of Corporate Affairs	Brazil
Leigh Howard	Asialink Business, University of Melbourne	CEO	Australia
Lin Xiong	Dahua Technology Brasil	CEO	China
Liu Zhen	Xiaomi Corporation	General Manager of Xiaomi Legal and Intl. Government Relations Dept.	China
Louisa Tomar	Center for International Private Enterprise (CIPE)	Director, Center for Digital Economy and Governance	United States
Lu Wang	Kuaishou Technology	Director of Global Public Policy	China
Lu Yinghong	Xiaomi Corporation	Senior Director	China
Lucas Tadeu Melo Camara	Mastercard	Public Policy Director	United States
Lynnette Magasa	Boniswa Group	CEO	South Africa
Maitreyee Kamble	Dalit Indian Chamber of Commerece and Industry (DICCI)	National Conevenor	India
Maram Aljishi	Asharqiyah Chamber of Commerce (Eastern province)	President of Sharqiyah Business Women Executive Council and an Advisor for eCommerce at Ministry of Commerce	Saudi Arabia
Marcelo Lacerda	Google	Director of Public Policy of Google Brazil	United States
Marcia Satie Miya	Apple	Government Affairs ALAC	United States
Marco Stefanini	Stefanini Group	President & Global CEO	Brazil
Maria Agustina Briner	UNION INDUSTRIAL ARGENTINA	ECONOMISTA	Argentina
Marienne Coutinho	KPMG Brazil	Tax Transformation & Innovation Lead Partner and Member of the Innovation Committee	Brazil
Mario Augusto Laffitte	Samsung Electronica da Amazônia LTDA	Public Affairs Vice President for Latin America	Republic of Korea
Martin Umaran	Globant (NYSE:GLOB)	President of Globant EMEA and Co-founder	Argentina
Martine Allaire	Orange	Director Corporate International Public Affairs	France
Mashael Bin Seaidan	Al Saedan For Industrial	Chairwoman	Saudi Arabia
Maxence Demerle	MEDEF	Digital affairs director	France
Maximiliano Villanueva	CNP Assurances Latam	Director of CNP Assurances Latam	France
Maylis Berviller	Business at OECD	Policy Analyst	France
Mica Beleni (Micaela Belen Iglesias)	quabund.ai	Artificial Intelligence Implementation Director	United States
Michaelle S. Bastos Pereira	Visa Inc	Government affairs	United States
Michele Bernardi Colombo	Race Comunicação	Account Manager	Brazil

Name	Organization	Position	Country
Milania Rogovtseva	SocialCap	Co-founder & CMO	United States
Nan CHEN	DiDi Global Inc.	Vice President	China
Natalia Soledad Facciolo	LUDMARC	CEO & Co Founder LUDMARC SRL	Argentina
Nayana Rizzo Sampaio	AWS - Amazon Web Services	Public Policy, AWS Brazil	United States
Nicole Primmer	Business at OECD (BIAC)	Deputy Executive Director, Policy and Strategic Engagement (Digital Policy Lead)	France
Norberto Capellán	Cámara Argentina de Comercio y Servicios	Director	Argentina
Oliver Wieck	ICCGermany	Secretary General	Germany
Orlando Taddeo	Mexedia	Ceo	Italy
Ornella Nitardi	BASF	Open Innovation & Digital Ecosystem Manager	Germany
Ozan Acar	Trendyol	Executive Committee Member	Türkiye
Panish Hangal	Larsen & Toubro	Practice Head	India
Patricia Ximenes Ulrich	Vale	External Affairs Senior Analyst	Brazil
Paula Maria Bibini	UNION INDUSTRIAL ARGENTINA	ABOGADA	Argentina
Paulo Rogerio Lino	Texan Chamber of Commerce in Brazil	Director	Brazil
Payal Dalal	Mastercard	Senior Vice President, Social Impact, International Markets, Center for Inclusive Growth	United States
Pedro Henrique Brasileiro do Vale	Salesforce	Gov affairs Manager	United States
Philipp-Andreas Schmidt	Bayer	Global Digital Farming Policy & Public Affairs Lead	Germany
Pietro Caminiti	Aeroporti di Roma SpA	Chief Information and Technology Officer	Italy
Prabhkiran Kaur Malhotra	Confederation of Indian Industry	Executive	India
Prarthana Borah	Aurassure	Director	India
Pravin Kulkarni	INFOSYS LIMITED	Vice President	India
Prem Prakash Dalua	TVS Motors	Senior Divisional Manager	India
Priscila Aguiar da Silva	Confederação Nacional das Seguradoras	Analyst Sr	Brazil
Prof. Vasily Vysokov	JSC Center-invest Bank	Chef of the Bord of Director	Russian Federation
Rafael Cervone Netto	Abit	Presidente Emérito da Abit	Brazil
Rajiv Kumar Gupta	PB Fintech ltd (Policy Bazaar and Paisa Bazaar)	Group President	India
Rebecca Enonchong	AppsTech	CEO	United States
Renata Vasconcellos	U.S. Chamber of Commerce	Executive Director	United States
Renata Vasconcellos	RELX	Head of LATAM Government Affairs	United Kingdom

Name	Organization	Position	Country
Renato Gasparetto Junior	Vivo - Telefonica Brasil	Vice President Public Affairs and Sustainability	Brazil
Renato Kindi Noda	CIELO S.A Instituição de Pagamentoc	Gerente de Relações Governamentais	Brazil
Ricardo Pelegrini	Quantum4 Soluções de Inovação	CEO	Brazil
Rodrigo Caramez	Sompo Seguros	Chief Strategy Officer	Brazil
Rohit Jain	Harvard Business School Alumni Association NC	CIO	United States
Rohit Kumar	Zedsoftpoint	Founder and CEO	India
Ruiqi Wei	EMLYON Business School	Associate Professor of Marketing	France
Sandra Alverà	Panasonic	Head of Sustainability and Government Affairs Europe	Japan
Sandra Rogenfisch	Sky Serviços de Banda Larga Ltda	Diretora	Brazil
Sanjay Chadha	Uber systems Ltd	Director and Head of Public Policy (India & South Asia)	United States
Sara Martucciello	Wade World Network Italia Srl	Lawyer expert in international negotiation	Italy
Sarah Goddard	AMICE	Secretary General	Belgium
Sergey Krasilnikov	Russian Union of Industralists and Enterpreneurs	Vice-president	Russian Federation
Sergio ARZENI	INSME International network for SME	President	Italy
Shipra Dawar	IWill and ePsyClinic	Founder and CEO	India
Shota Watanabe	Nomura Research Institute, Ltd.	Expert Researcher	Japan
Shriranjani Rao	VFS Global	Corporate Communications Lead- Americas	United Arab Emirates
Shweta Bhardwaj	Johnson and Johnson	Director, Global Digital and R&D Policy	United States
Silvana Gonçalves de Oliveira	Studio Dibea	Ceo & Digital Export Manager	Italy
Srikanth Rajagopalan	Perfios Account Aggregation Services (P) Ltd.	Chief Executive Officer	India
Stefanie Stündel	BDI Federation of German Industries	Senior Representative Digitalisation and Innovation	Germany
Stephanie Marcucci Viehmann	German-Brazilian Chamber of Commerce and Industry	Head of Communications	Germany
Sundeep Sikka	Nippon Life India Asset Managment Limited	CEO	India
Svetlana Stoilova	BusinessEurope	Adviser Digital Economy	Belgium
Tatiana de Assis Ribeiro	Movimento Brasil Competitivo	Executive Director	Brazil
Thais Marçal	Globo	Institutional Relations Manager	Brazil
Thiago Regueira Curvello	Michelin	Head of Digital Transformation for South America	France
Tiago Machado	Telefonica VIVo	Director of Institutional Relations	Brazil

Name	Organization	Position	Country
Ulrike Bahr-Gedalia	Canadian Chamber of Commerce	Senior Director, Digital Economy, Technology & Innovation	Canada
Varsha Vibhandik	Vv group	Ceo	India
Venkat Krishnan	ITAM Forum	Sustainability Head	United Kingdom
Vinod Sood	Hughes Systique Corporation (HSC)	Co-Founder & Managing Director	India
Vitaliy Anikin	Zyfra Group	Chairman of the Board of Directors	Russian Federation
Vittoria Carli	Confindustria Servizi Innovativi e Tecnologici	Vice President	Italy
Vyani Manao	Daikin Indonesia	Digital Transformation Consultant	Japan
Wanderley Mariz	Meta	Head of Public Policy - Executive Branch	United States
Wei Jiaxin	HUAWEI DO BRASIL TELECOMUNICACOES LTDA	pr manager	Brazil
Wesley Leong	QUANTUMBLACK VISUAL ANALYTICS LIMITED	Senior Principal Product Manager	United Kingdom
Wojciech Pawlus	Comarch SA	Vice-President, Member of the Management Board	Poland
Yao Yuan	CCOIC	Project Manager	China
Yasemin Avci	TUSIAD	Information Society and Innovation Director	Türkiye
Yevgeny Charkin	Joint Stock Company "Russian Railways" (JSCo "RZD")	Deputy CEO (Digital Transformation and Information Technology)	Russian Federation
Yohanes Lukiman	Blibli Tiket Group	Senior Vice President - Head of CEO Office and Business Development	Indonesia
Yuri Maia	Regional NSW	Economic Development Manager	Australia
Zeda XU	China Council for the Promotion of International Trade	Director	China
Zhan Ruichao	China Chamber of International Commerce	Deputy Director General	China

Task force Meetings Schedule

Data	Format
22 February 2024	Virtual
26 March 2024	Virtual
19 April 2024	Virtual
23 May 2024	Virtual
12 June 2024	Virtual
10 July 2024	Virtual

Annex E – Partners

Knowledge Partner

BAIN & COMPANY

Network Partners

BUSINESSatOECD

WORLD ECONOMIC FORUM

unesco

MOBILIZAÇÃO EMPRESARIAL PELA INOVAÇÃO