By:

INDONESIAN CHAMBER OF COMMERCE AND INDUSTRY

B20 INDONESIA 2022 BUSINESS

ADVANCING INNOVATIVE, INCLUSIVE AND COLLABORATIVE GROWTH

DIGITALIZATION TASK FORCE

POLICY PAPER

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FOREWORD BY THE TASKFORCE CHAIR

B20's objectives represent the interest of the business community of the G20 members, support the G20 with impactful and actionable policy recommendations, and foster dialogue between public and private sectors at the G20 level and with an international institution.

As chair of the Digitalization task force, Telkom Indonesia will actively promote digitalization for economic health and national resiliency through collaborative recovery and growth among B20 members.

The Digitalization task force's role is to encourage policies in the field of digitization; therefore, we are pushing for digitalization to be a major factor in driving the global economy forward.

In order to enhance the role of digital as a key driver of nation building and economic development, countries need to reinforce digital infrastructure and literacy to unlock potential, emphasize fundamental supports of small medium enterprises in digital transformation, and build up the importance of cybersecurity and basic rights in the digital era.

Why is digitalization pivotal in accelerating socio-economic growth? Digitalization serves as a crucial factor for economic growth and resiliency.

Digitalization has become critical in accelerating and fostering economic growth for countries worldwide. We believe that digitalization can make developing countries leap to pursue equality with developed countries but key challenges hindering inclusivity in digitalization persist.

The pandemic accentuated the value that digitalization brings to society, it also highlighted the correlation between digital maturity and economic resiliency.

B20 is an avenue to reshape the future of post-pandemic digitalization. The business community has been playing and continues to play an essential role in shaping digitalization across the world. The B20 has also been actively voicing the need to strengthen multilateral governance on digitalization to address today's pressing challenges. We hope our final policy paper could help identify practical measures, including driving forward global digitalization and nurturing the tech ecosystem.

Sincerely,

Ririek Adriansyah

Chair of the B20 Digitalization Task Force
President Director of PT Telkom Indonesia (Persero) Tbk

FOREWORDS BY THE TASK FORCE CO-CHAIRS

CO-CHAIR	FOREWORD
 **Börje Ekholm** President & CEO, Ericsson Group	*Digitalization ushers in more sustainable economies with new possibilities for us to earn, learn, socialize, and experience the world together. Connectivity is a prerequisite for digitalization, and governments must prioritize the rollout of affordable, high-performing networks, whilst ensuring people have the skills and tools to safely engage online.*
 **Cem Dener** Lead Governance Specialist in the Governance Global Practice, the World Bank	*GovTech has great potential to deliver improvements in quality, efficiency, and transparency of government systems and administrative services. To realize this potential, Governments need to create the enabling environment to facilitate digital transformation, provide incentives for private sector to participate in public sector digitization, and adapt to changing societal demands.*
 **Hans-Paul Bürkner** Managing Director & Global Chair Emeritus, Boston Consulting Group	*Digitization will be a big enabler for all sectors in the economy, for individuals and therefore for the whole of society. Unleashing the power of digital transformation should be at the top of public and private companies' agenda, by ensuring access to connectivity, infrastructure development and open markets for all.*
 **Andre Soelistyo** CEO, GoTo Group	*MSMEs are the backbone of many emerging economies in the world. With MSMEs being one of the most impacted by declining economies, digital platforms play a paramount role in supporting MSMEs transition into the digital ecosystem and helping them thrive. Focusing on the growth of the MSMEs will expedite the economic recovery as well as foster economic resilience.*

FOREWORDS BY THE TASK FORCE CO-CHAIRS

CO-CHAIR	FOREWORD
 **Wang Jian** Founder, Alibaba Cloud	*Economic development used to be measured in increase of electricity consumption. Now, it is being replaced by increasing usage of computing power. This marks a transition from industrial to digital economy, which ushers in an era of unprecedented opportunity. In the last decade, while the fundamental transformation of IT infrastructure fueled the development of cloud computing, cloud computing has transformed the landscape of information technology. Today, we see the same dynamics playing out between cloud computing and computing power. In another 3-5 years, economic development will be measured in dramatically different ways, and computing power will likely be a key indicator for future economy.*
 **Christian Gebara** CEO, Telefónica Brazil	*Societal impact of digital transformation is huge. Therefore, it is crucial a prompt and coordinated action between the public and the private sector is aimed at ensuring we reap the huge benefits it brings to everyone. A human-centric approach on this digital revolution is the only way to guarantee an inclusive and sustainable future for coming generations.*
 **Michael Punke** Vice President for Global Public Policy, Amazon Web Services	*Digitalization has the power to accelerate innovation and economic growth in an inclusive and sustainable way. The digital economy is everyone's economy; it is up to us to build the policy foundations to unlock a cloud-enabled and data-driven digital economy, and empower our societies to provide solutions to the most pressing issues we face today, and for years to come*

TASKFORCE COORDINATION GROUP

DEPUTY CHAIR

Muhamad Fajrin Rasyid
Director of Digital Business,
PT Telkom Indonesia
(Persero) Tbk

POLICY MANAGER

Hans Lukiman
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KNOWLEDGE PARTNER

BCG

NETWORK PARTNERS

BUSINESSatOECD

GLOBAL BUSINESS COALITION

ICC INTERNATIONAL CHAMBER OF COMMERCE
The world business organization

WORLD ECONOMIC FORUM

WORLD BANK GROUP

RECOMMENDATIONS: EXECUTIVE SUMMARY

Recommendation 1 – Drive universal connectivity:
Ensure future proof connectivity for all, fostering universal access to participate in the digital economy and government services, ensuring inclusion and eliminating the digital divide

Policy action 1.1: Ensure access to high-speed, high-capacity digital infrastructure for digital inclusion and support private efforts to bring inclusive connectivity for all, especially for developing countries

Policy action 1.2: Accelerate network buildout through multiple initiatives, utilizing Fixed, Mobile, and Satellite Broadband systems to expand network coverage and increase capacity. Promote fair competition, global standards, and act to remove deployment barriers

Policy action 1.3: Ensure higher usage of internet by making internet relevant for users by providing meaningful local content to citizens, and accessible to all by ensuring that the cost of devices, internet services and other value chain components do not limit adoption

Recommendation 2 – Build foundation for sustainable and resilient digital economy:
Accelerate development of digital infrastructure

Policy action 2.1: Unlock digital opportunities across the economy at large that prioritize ESG, to enhance competitiveness and drive inclusive growth

Policy action 2.2: Encourage open, innovative, and coordinated digitalization of governing institutions to enhance public service delivery, through modern innovative business models and regulations

Policy action 2.3: Promote adoption of digital infrastructure (cloud, digital identification, digital payment systems, digital signatures, amongst others) and facilitate the importance of data free flow with trust and cross-border data flows on the premise of respecting the domestic legal frameworks of each country

Recommendation 3 – Ensure a digital ready mindset for individuals and Micro, Small, and Medium Enterprises (MSMEs), and enabling MSMEs through access to digital platforms:
Fostering tech-enabled workforce and companies

Policy Action 3.1: Define specific desired practical outcomes in mindset by level of education (Primary, secondary, tertiary) to individuals, while promoting the use of digital equipment and solutions to enhance learning experience

Policy Action 3.2: Improve individuals' technical digital skills through continuous education, involving multistakeholder cooperation, to increase their propension to use digital products and services and

their ability to navigate the cyberspace safely and mindfully especially for MSMEs, however applicable across all companies at large

Policy Action 3.3: Accelerate responsible innovation and digital adoption especially by MSMEs, however applicable across all companies at large, by promoting policies to provide access to digital platforms that can help build competitive markets

Policy Action 3.4: Increase efforts to provide sustainable and fair financing for MSMEs to adopt digital technologies

Recommendation 4 – Promote risk and evidence-based, interoperable, and technology-neutral cybersecurity standards and best practices that support companies' efforts to protect their networks:

Define cybersecurity protocols, promoting enhancement of cybersecurity practice and education to private users and companies, including MSMEs

Policy Action 4.1: Define cybersecurity and cyber resilience interoperable standards and best practice using a risk and evidence-based, technology-neutral approach to all levels of supply chain

Policy Action 4.2: Promote enhancement of cybersecurity practice through increasing awareness of security threats, bridging cybersecurity skill gaps, requiring government vendors to meet self-regulating cybersecurity standards, increasing cross-border cooperation, and championing the implementation of universally recognized norms, rules, and principles

INTRODUCTION

The criticality of digitalization can be seen similarly to electrification 100 years ago, implied by the fact that digitalization continues to heavily transform the way we live, work, and interact with each other as well as with our environments. There was a strong global growth in internet use due to a 'COVID connectivity boost', with the estimated number of people who have used the internet surging to 4.9 billion in 2021, from an estimated 4.1 billion in 2019[1]. Meanwhile, the connection quality of those that are connected is moving in the right direction, with 1.38% GDP increase per 10% increase in broadband penetration[2] which unlocks ways to address global challenges of stagnant productivity impacting economy, climate change pressures, inequality in access to work, healthcare, markets, and education. Benefits that digitalization brings will be inclusive towards all parts of society, it will not make disadvantaged groups obsolete.

Digital infrastructures (defined in this paper as digital technologies that provide the foundation for an organization's information technology and operations), promise to have a significantly productive impact on our societies and have a positive impact on companies' ESG commitments. It is expected to extensively transform global economies, by as early as 2030 delivering USD 8 trillion[3] in value around the world. In the short-medium term, future-proof technologies such as big data, Artificial Intelligence (AI), Internet of Things (IoT), and Machine-to-Machine (M2M) technologies are boosting efficiency and unlocking values delivered by organizations like never before, with big data and AI contributing around USD 4.5 trillion and IoT and M2M contributing around USD 15 trillion revenue by 2025[4]. Identity, privacy, and cybersecurity is also increasingly important, as seen from the estimated cost of cybercrime of USD 2 trillion in 2021, significantly increasing from USD 400 billion in 2015.

Digitalization is essential to achieving firms' ESG commitments. For example, digitalization has the potential to reduce global carbon emissions by up to 15%[5], making a significant contribution to meeting the overall 40% reduction target set by many countries in reference to the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement by 2030 (compared to 1990 levels). Furthermore, the Global e-Sustainability Initiative estimated that 11 out 17[6] of SDG targets can be directly influenced by digital technologies such as digital access, faster Internet, cloud services, IoT, cognitive technologies, digital reality, and blockchain.

However, digitalization can also bring challenges to the overall sustainability agenda. As an example, the digital infrastructure's environmental imprint poses a challenge to our world and future generations. If we want digitalization to help combat climate change and reduce our environmental impact on the earth, we must address the demand for precious/rare metals required for production and the massive consumption of energy required to power the infrastructure. There are opportunities to be had, and many businesses are making investments in greening their operations. Additional efforts are required, particularly in the transition to 100% renewable energy, enhanced data center cooling systems, and the re-use of produced heat as well as spent materials[7].

1 International Telecommunication Union (ITU)
2 ITU, Economic Impact of Broadband, Digitization, and ICT Regulation, 2020
3 Nokia's 5G Readiness Report, 2020
4 Gartner, Magic Quadrant for Data Science and Machine Learning Platforms, 2021
5 WEF, Digital technology can cut global emissions by 15%, here's how, 2019
6 Digital Access Index, 2021
7 UN, Growing Footprint of Digitalization, 2021

With the pandemic coming into play, digital adoption around the world has also risen significantly. The World Bank Business Pulse Survey, a survey conducted of businesses of various scales (small, medium, and large) across 79 countries and more than 100,000 firms, indicated that amidst decreasing sales and high turnover rate during the pandemic, one silver lining of the crisis was the acceleration of digital technology diffusion. The survey indicated that 44% of businesses increased their adoption of digital technologies and 29% of businesses invested in new digital technologies, resulting in acceleration towards pre-pandemic sales performance and productivity[8].

Smartphone penetration rates are also seeing significant progress, with projections of all regions having more than 80% of its population owning a smartphone by 2025, except for the Africa region which is predicted to have around 64% of its population owning a smartphone[9].

Furthermore, as the world adapted to digital disruption during the pandemic, businesses had to deal with two types of disruption: changing consumer behaviors and changing staff needs. To maintain productivity, the private sector relied heavily on distant digital access, and e-commerce became one of the only viable sales channels. Subsequently, internal challenges such as changing working practices, with remote work becoming the norm, quickly became important. Similarly, government agencies were forced to transfer most of their services to digital apps to assure service continuity and support citizens during the pandemic.

Businesses, governments, and individual levels of preparedness in navigating the digital era quickly became important for survival. The pandemic highlighted the 'digital divide' as a real and growing problem, with those enjoying inclusion in the digital economy and ecosystems reaping their benefits, while those who fall outside of the digital realm continue to fall further and further behind. To close the digital divide, collectively we need to advance moving beyond fragmented e-government solutions both domestically and regionally to key digital building blocks and digital infrastructures that will stimulate pervasive inclusion across all socioeconomic levels.

Two of the objectives of Indonesia's presidency at the G20 are to bridge the digital divide and foster inclusive digital transformation – to radically accelerate the integration of underprivileged citizens into the digital economy. To do so, the business leaders and government leaders across the G20 must agree on a common vision and understanding on what constitutes digital inclusion – with building blocks acting as a springboard for each person to tap into global digital networks.

Indonesia is among the first to recognize the power of digital transformation in sectoral economics. As the leading producer of decacorns in ASEAN, the country proudly participates in and fosters a thriving tech scene – yet at the same time Indonesia would also be the first to admit that much more can and needs to be done in involving those at the bottom of the pyramid. In Indonesia, examples of that would be citizens in *Daerah 3T* (*Daerah Tertinggal, Terdepan dan Terluar*; or disadvantaged, outermost, and frontier regions).

Foundational digital infrastructures serving both the private and the public sector will need to use e-government for holistic economic and social development. The private sector needs to take the lead on development of fundamental digital infrastructure, supported by a friendly regulatory environment.

8 World Bank, World Bank Business Pulse Survey
9 Statista, Number of 5G connections worldwide by region, 2021-2025, 2021

The governments of G20 economies should act not only as policy makers, but also as leaders in digital inclusion. Public policy actions can support system-wide transformations which ensure that no one is left behind. The B20 Digitalization Task Force is ready to support G20 governments as potential funders, participants, technology partners, as well as with other modes of collaboration.

The Digitalization Task Force identifies 4 main obstacles that contribute to the digital divide and prevent inclusive digital transformation.

- Different levels of readiness hamper the ability of countries and businesses to utilize digitalization as a key driver for national building and economic development
- The lack of digital infrastructure and literacy
- Insufficient support for MSME's digital transformation
- Issues of cybersecurity and basic rights in digital era

Considering all the cases mentioned above, we believe that digitalization is one of the world's most pressing issues to tackle. Hence, we make a strong case for the following 4 policy recommendations:

- Drive universal connectivity
- Build foundations for sustainable and resilient digital economy
- Ensure a digital ready mindset for individuals and MSMEs, and enabling MSMEs through access to digital platforms
- Promote risk based, interoperable, and technology-neutral cybersecurity standards and best practices that support companies' efforts to protect their network

RECOMMENDATION 1

Drive universal connectivity:

Ensure future proof connectivity for all, fostering universal access to participate in the digital economy and government services, ensuring inclusion and eliminating the digital divide

POLICY ACTIONS

Policy Action 1.1 – Ensure access to high-speed, high-capacity digital infrastructure for digital inclusion and support private efforts to bring inclusive connectivity for all, especially for developing countries

Policy Action 1.2 – Accelerate network buildout through multiple initiatives, utilizing Fixed, Mobile, and Satellite Broadband systems to expand network coverage and increase capacity. Promote fair competition, global standards and act to remove deployment barriers

Policy Action 1.3 – Ensure higher usage of internet by making internet relevant for users by providing meaningful local content to citizens, and accessible to all by ensuring that the cost of devices, internet services and other value chain components do not limit adoption

LEADING MONITORING KPI

OWNER: G20 COUNTRIES

	Baseline	Target
% of People Connected to the Internet *Source: International Telecommunication Union (ITU)*	**63%** *(2021)*	**70%** *(2024)*

SDG IMPACT

Recommendation 1 contributes to the achievement of UN's SDG for the goals: 8: Decent Work and Economic Growth, 9: Industry Innovation and Infrastructure, 10: Reduced inequalities, 17: Partnership for the goal

Policy action 1.1 - Contributes to better work standards and economic growth by solving connectivity issues across geographies. Increasing connection quality has a positive impact on GDP contributing to target **8.1** *(Sustain per capita economic growth in accordance with national circumstances and, in particular, at least 7 percent gross domestic product growth per annum in the least developed countries)* and **8.2** *(Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labor-intensive sectors)*.

In addition, increasing connection reach would benefit indicator **17.6.2** *(Fixed internet broadband subscriptions over 100 Inhabitants by speed)* as well as indicator **17.8.1** *(Proportion of individuals using internet)*

Policy action 1.2 - By focusing on accelerating network buildout through multiple initiatives, PA 1.2 impact target **9b** *(Support domestic technology development, research, and innovation in developing*

countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities).

In addition, PA 1.2 also contributes to target **9c** *(Significantly increase access to information and communications technology and strive to provide universal and affordable access to the internet in least developed countries)* in which affordable and universal access is the key target.

By granting the same level of connectivity and reducing inequalities in technology access, it would also benefit target **10.1** (By 2030, progressively achieve and sustain income growth of the bottom 40 percent of the population at a rate higher than the national average).

Policy action 1.3 – By making sure that cost of devices, internet access and other value chain components do not limit adoption, this policy action impact target **9c** *(Significantly increase access to information and communications technology and strive to provide universal and affordable access to the internet in least developed countries)*

As well as target **10.3** *(Ensure equal opportunity and reduce inequalities of outcome, including by eliminating discriminatory laws, policies and practices and promoting appropriate legislation, policies and action in this regard)*

G20 INDONESIA PRIORITY IMPACT

Recommendation 1 commits towards the achievement of one of G20 Indonesia 2022's key priorities, which is Digital Transformation, by striving to see a world that is better connected and eliminating digital divide.

Policy Action 1.1 aims at granting equal access to everyone in accessing the internet, which would help pave the way for a more inclusive digitalization for all.

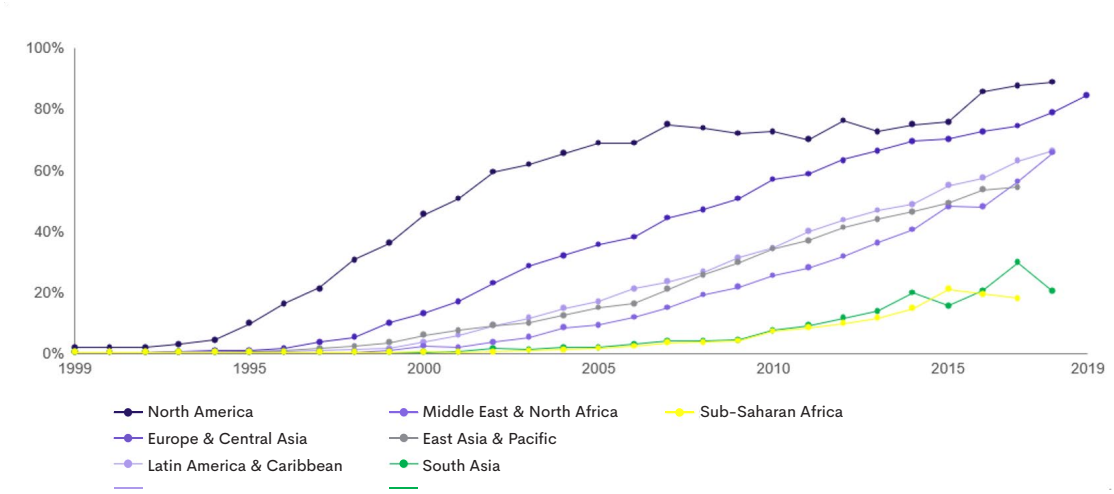
Policy Action 1.2 aims to accelerate network buildout through multiple initiatives, including promoting fair competition, global standards, and act to remove deployment barriers. By doing so, this policy action also contributes to the digital transformation.

Furthermore, as **Policy Action 1.3** sought to ensure higher usage of internet by providing meaningful local content and making internet accessible for all. By doing so, this policy action also contributes to the Digital Transformation.

CONTEXT

In recent years, connectivity has been a pillar of economic growth and a key enabler of digital transformation. The number of people who are connected is expanding, and internet penetration is increasing in all parts of the world, as seen from the share of population using the internet. However, only half of the world's households have access to internet connectivity at sufficient speeds today[10].

Exhibit 1 | Share of population using the internet, 2019

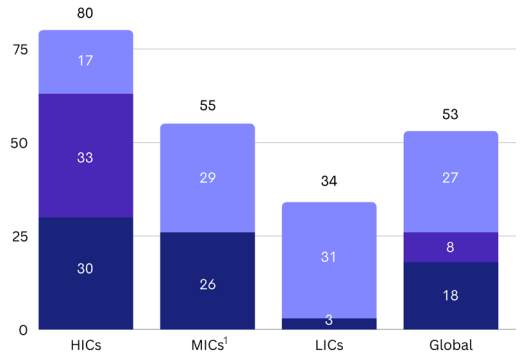


Source: Our World in Data

Exhibit 2 | Access to Internet Connectivity Worldwide & Goal for the Future

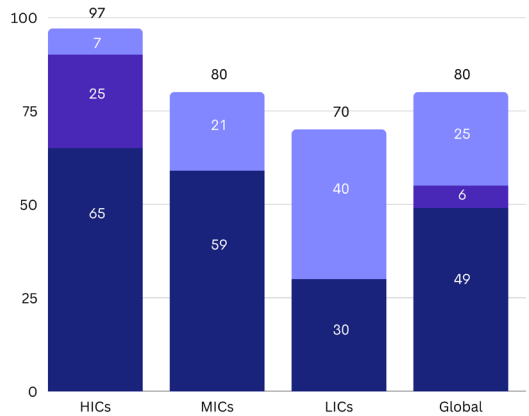
Only half the world's households have access to internet connectivity at sufficient speeds today

Households with internet access at sufficient speeds in 2020 (%)



The goal is to exceed the ITU's target of providing 75% of households with access by 2025

Households with internet access at sufficient speeds by 2025 (%)



Mobile only | Fixed (nonfiber) and mobile | Fixed (fiber) and mobile

1. If China is excluded, only 53% of people in MICs are connected at sufficient speeds–18% by fiber, and 35% by mobile

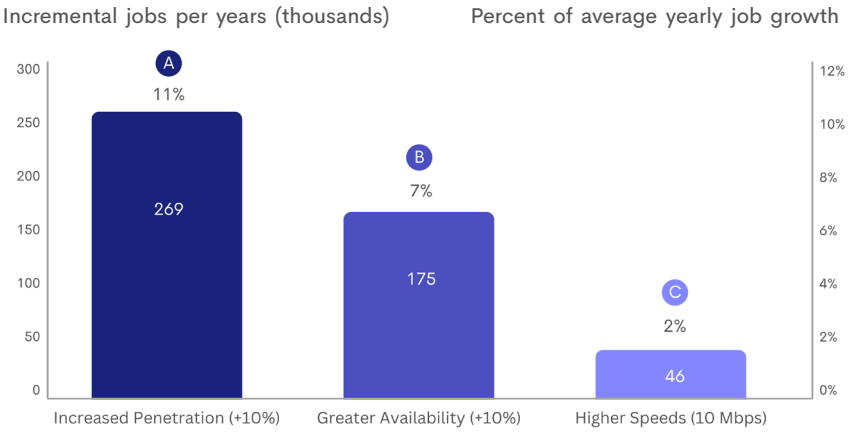
Source: Ovum WBIS; GSMA; Ookla; World Bank; BCG analysis

10 BCG, A $2 Trillion Plan to Bring Two Billion More People into the Digital Age, 2020

Mobile internet is the dominant mode of internet connection for the majority of the world's population; according to Ericsson Mobility Report 2021[11], we currently have a thriving global ecosystem with 8.1 billion mobile connections in 2021, which encourages new waves of innovation, such as the App economy[12]. Except for fixed wireless access (FWA), mobile networks handle about 300 times more traffic in 2021 than they did in 2011, network speeds have increased hundreds of times, and there are currently nearly 20,000 different 4G device models on the market. Without the industry's ability to grow and the never-ending advances in network efficiency, none of this would have been feasible. This has been achieved through global standards, which have allowed mobile technologies to compete, succeed, and scale globally, driving up affordability for consumers in all countries.

The faster connection speed on both fixed and mobile broadband infrastructures is unlocking more valuable use cases, resulting in economic impact, with one example being job creation. Historically, analysis shows, with US data, a 10-percentage-point increase in broadband penetration would have resulted in more than 806,000 additional jobs, or an average annual increase of 269,000 jobs (increment of 11%). Second, there is also a great correlation between broadband availability, jobs, and GDP growth. A 10-percentage-point increase in broadband access would have resulted in more than 875,000 additional jobs and USD 186 billion more in economic output (increment of 7%). Lastly, this same analysis showed that adoption of higher speeds drives noticeable improvements in job growth. Adding 10 Mbps to average download speeds would have resulted in 139,400 additional jobs or 46,500 additional jobs per year (increment of 2%)[13].

Exhibit 3 | Economic Impact of Digital Divide



Source: Deloitte analysis of broadband, economic, and population data (e.g., FCC, US Census Bureau of Labor Statistics, etc.)

The COVID-19 crisis has impacted people in many countries, significantly influencing their daily lives. Indeed, connectivity has proven to be a major driver in enabling a global response to the COVID-19 pandemic. With many activities forced to move to digital channels, internet access has played a pivotal role in work, education, and social life. During lockdowns, internet data traffic surged up to 60%[14], the use of virtual communication tools rose 10 times, and online streaming

11 Ericsson, Mobility Report, 2021
12 The App Economy refers to the smartphone and tablet revolution whereby a mobile application is available for just about everything.
13 Deloitte, Broadband for All. Charting a Path To Economic Growth
14 Nielsen COVID-19 Tracking the Impact on Media Consumption, 2020

increased by more than 50% all around the globe[15]. The pandemic has accelerated the focus on digital transformation and according to Gartner's 2021 CEO and Business Executive Survey, 36% of CEOs placed a technology-related priority as their second most important priority after growth with 20% specifically mentioning "digital" priorities[16]. Of the IT purchasing decision-makers Nokia surveyed in eight markets, 45% said they had accelerated their digital transformation programs because of COVID-19, compared to just 18% who have not[17].

However, universal connectivity has yet to be achieved. According to the latest ITU data, 87% of people are using the internet in developed countries, compared with 44% in developing countries[18]. Nearly half of the world remains unconnected[19], particularly in developing countries.

According to a survey by the GSMA there are five main barriers to internet adoption and use. These are lack of digital literacy and skills, affordability, content relevance, safety and security, and access to networks and other enablers[20].

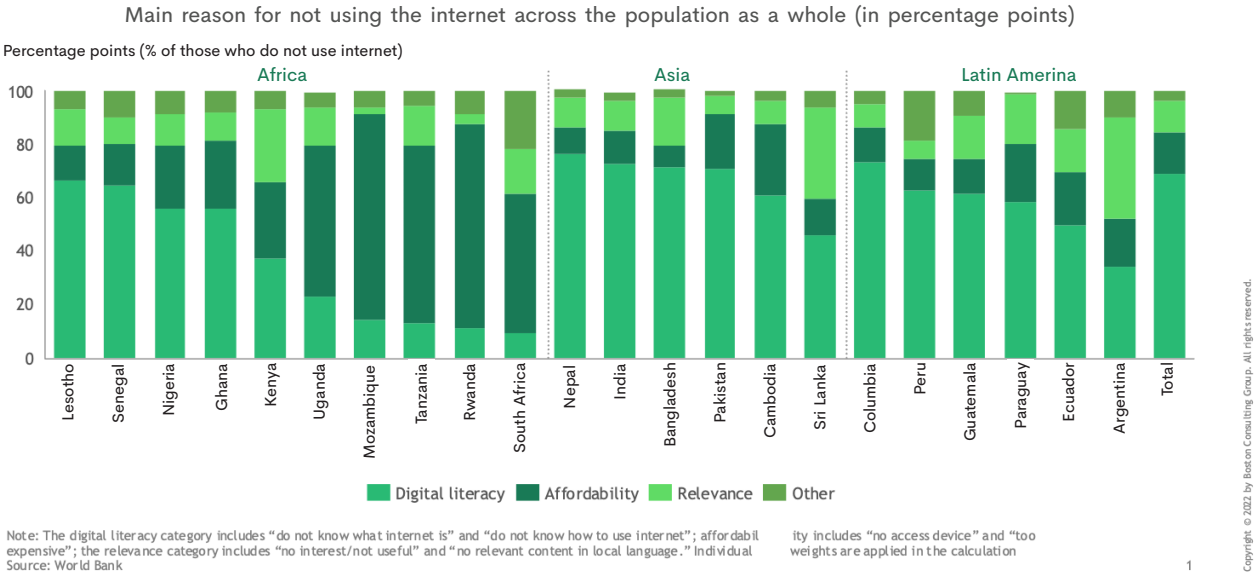
Exhibit 4 | Key Barriers to Mobile Internet Adoption and Use

Source: GSMA, The State of Mobile Internet Connectivity, 2021

Based on a survey conducted by the World Bank to African, Asian and Latin America countries, the most common reasons for not using the internet are "do not know what the internet is" (58.9%) and "do not know how to use the internet" (10.1%). Another barrier to internet usage is a lack of access to a device (computer or mobile phone) (11.5%). Lack of material in the local language or data privacy concerns remain secondary factors compared to literacy and affordability.

15 Nielsen COVID-19 Tracking the Impact on Media Consumption, 2020
16 Gartner, CEO Survey, 2021
17 Nokia, 5G readiness report, 2020
18 ITU, Digital Inclusion of All, 2021
19 UNESCO, New report on global broadband access underscores need to reach the half of the world still unconnected, 2019
20 GSMA, The State of Mobile Internet Connectivity, 2021

Exhibit 5 | Main reason for not using the internet across the population



Source: World Bank, A Demand-Side View of Mobile Internet Adoption in the Global South, 2021

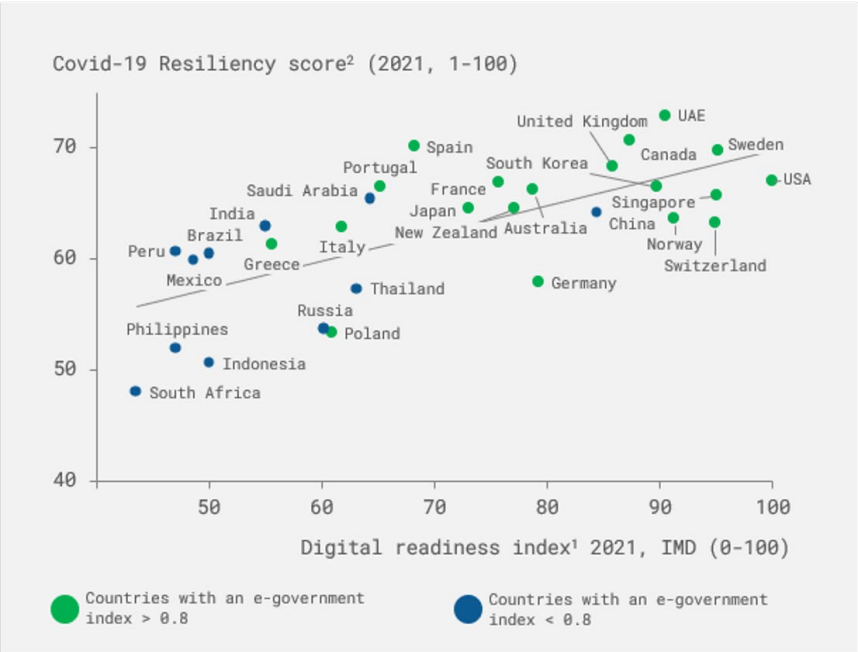
The impact of a digital divide between people with and without internet access grows in parallel with increasingly visible consequences. Children have been cut off from educational possibilities because they are compelled to attend class from home without a dependable connection or an adequate device. Gaps in global connectivity are not restricted to rural areas; even within cities, certain zones receive less service than others.

Impact of a digital divide also correlates directly with a country's resiliency in tackling the COVID-19 pandemic. As defined by the World Bank, 'resilience' is the ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration or improvement of its essential basic structures and functions[21].

As seen in Exhibit 3, we note that countries with higher digital readiness scores were better prepared to respond to the pandemic. In addition, countries with higher COVID-19 resiliency scores also had a better e-government index.

21 World Bank, Building Resilience, 2013

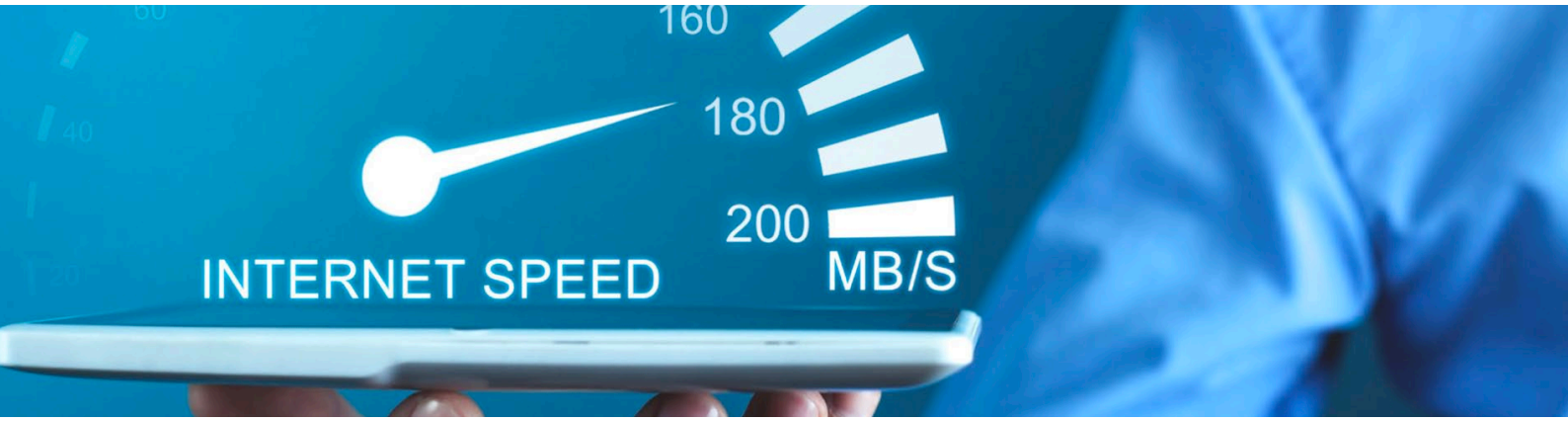
Exhibit 6 | Covid-19 Resilience Score vs Digital Readiness Index



Source: Study with comparation from; IMD World Digital Competitiveness Ranking 2021; Bloomberg Covid Resiliency Ranking as of Dec 2021

In the effort to guide the G20 towards a tangible and impactful change, the B20 Digital Task Force seeks to draw attention to three key priority actions to ensure a strong reduction of connection inequalities:

- Ensure access to high-speed, high-capacity digital infrastructure for digital inclusion and support private efforts to bring inclusive connectivity for all, especially for developing countries
- Accelerate network buildout through multiple initiatives, utilizing Fixed, Mobile and Satellite Broadband systems to expand network coverage and increase capacity. Promote fair competition, global standards, and act to remove deployment barriers
- Ensure higher usage of internet by making it relevant for users by providing meaningful local content to citizens, and accessibility for all by ensuring that the cost of devices, internet services, and other value chain components do not limit adoption



Policy Action 1.1: Ensure access to high-speed, high-capacity digital infrastructure for digital inclusion and support private efforts to bring inclusive connectivity for all, especially for developing countries

The G20 should ensure that connectivity is 'fit for purpose', that defines adequate coverage for their national needs, today, and tomorrow

When discussing network capillarity[22] and inequality, the G20 members need to go back to the basic infrastructure needs to promote digital inclusivity; as an example, G20 members need to check whether countries already have power access for the consumer to charge their mobile devices or to connect with the telecom networks/mobile antennas. In the case of network quality, G20 members need to consider whether the government is already rewarding the correct spectrums for specific internet quality needs and at fair prices that do not compromise network deployment investments. Without these basic needs fulfilled first, it will be challenging for nations to continue with the digital inclusion agenda.

In addition, the speed at which technologies and services evolve is unprecedented. Hence, what today might be considered a good level of connectivity to enjoy a service may become obsolete within one year . Additionally, the digitalization usage levels across regions and countries varies significantly and what is a minimum adequate level of connectivity in a highly developed place might be unrealistic and impossible to achieve in a less developed country. On the contrary, acceptable levels in a developing country might be insufficient for a highly developed country. Levels of connectivity should provide an achievable target for each country and thus cannot be extrapolated to other places. Nonetheless, all countries should aim for qualitative levels of connectivity in the long-term to help reduce the existing digital divide.

The G20 should perform heatmapping of geographic population versus the coverage of various terrestrial and satellite internet connectivity to provide a common picture of global coverage and a base for concerted action

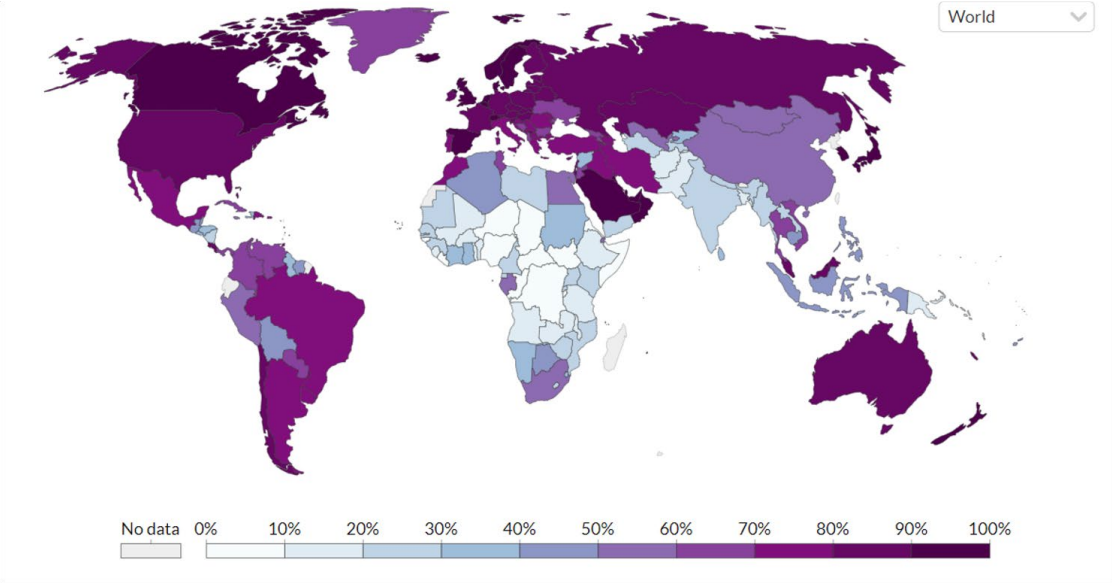
22 A capillary network is a local network that uses short-range radio-access technologies to provide local connectivity to things and devices.
Source: Ericsson

Over 1 billion new internet users have joined the global network in the last five years. Despite this, just under half of the world's population (2.9 billion) do not have access to the internet. They are primarily found in the least developed nations (LDCs), landlocked developing countries (LLDCs), and small island developing states (SIDS)[23]. According to the most recent data from the International Telecommunication Union, 87% of people in developed countries use the internet, compared to 44% in developing ones.

Hence, to prevent further digital divide, the G20 members should perform heatmapping of geographic population versus the coverage of terrestrial internet connectivity (3G, 4G, 5G) to ensure that we have appropriate mapping of the connectivity gaps to be bridged, allowing for a more targeted approach. As seen on the exhibit below, ITU has created a share of the population using the internet on a country basis. The G20 may expand this approach in two ways: i) to go beyond country penetration assessment to assess regions within the country, and ii) to assess not only internet penetration, but also internet quality, enabling a more targeted approach on how to increase network broadband quality.

To ensure progress toward reducing the digital divide, the G20 can create a heatmap of geographic population compared with the coverage of different internet connectivity (3G, 4G, 5G). This would allow for a targeted prioritized approach toward development plans and the tracking of progress.

Exhibit 7 | Share of population using the internet, 2019



Source: ITU, World Bank

The G20 needs to create a targeted approach and prioritize initiatives based on the heatmap to aim for maximum impact on ensuring digital inclusiveness for all

Based on the heatmap of geographic population against the coverage of various terrestrial internet connectivity, the G20 should create a more targeted approach on how to tackle the lack of internet

23 ITU, Measuring Digital Development, 2021

access and quality by understanding the root causes of lower network coverage. If a country has lower network coverage due to lower affordability of internet access, the government can create a tailored approach to reduce internet costs for end users such as offering a discounted spectrum in return for obligations to cover rural and remote areas.

The G20 can also prioritize which countries to assist immediately based on lowest number of internet users and the biggest potential to narrow the digital divide.

To truly address the digital divide, the G20 should consider disadvantaged groups in prioritizing initiatives. Women, elderly people, people with disabilities, individuals on the move, and indigenous peoples, among other disadvantaged and marginalized groups, require specific and varied efforts to achieve digital inclusion. These include identifying and changing discriminatory policies and practices, raising awareness of the digital divide, and countering stereotypes in the digital domain by using more empowering images of women, older people, and other oppressed groups[24].

24 ITU, Leveraging digital technologies for social inclusion, 2021

Policy Action 1.2: Accelerate network buildout through multiple initiatives, utilizing Fixed, Mobile and Satellite Broadband systems to expand network coverage and increase capacity. Promote fair competition, global standards and act to remove deployment barriers

High-capacity and robust connectivity networks, intended as infrastructure and technology capable of delivering gigabyte speeds, allow businesses and communities to grow their competitiveness, quality of life, education level, and economic prosperity. One example would be the use of subsea cables connecting countries across the world. As an example, in August 2021, Google and Facebook announced that they would develop a subsea cable system, dubbed "Apricot", for 2024 to improve internet connectivity, and serve growing demand for broadband access, and 5G wireless connectivity across the Asia-Pacific region, including Japan, Singapore, Taiwan, Guam, the Philippines and Indonesia[25].

The deployment of new generations of broadband networks, expanding their reach and upgrading their performance, is crucial to accomplishing economic recovery and growth. Moreover, existing social imbalances risk further widening if technologies and connectivity continue to spread heterogeneously. There is a very real risk for this. For example, by 2027, it is estimated that 90% of all mobile subscriptions in North America will be 5G, whilst in Sub-Saharan Africa, it will be only 10%.

The development of cutting-edge networks may be facilitated through public and private cooperation aimed at stimulating innovation and enabling favorable financial conditions to promote new investments. This could be achieved by ensuring an investment-friendly environment, free of unnecessary barriers to network deployment, where technology or vendor neutrality prevails and where markets, rather than governments, decide which technologies will succeed through fair and transparent competition.

Hence, it is important to support network expansion for internet service providers through multiple initiatives, as per below:

- Facilitating business operations under competition rules
- Encouraging new viable business models, where there is no competitive solution

25 Bloomberg, 2021

- Promoting technology neutrality
- Support in driving network expansion costs down partly through fostering transparent and efficient permit granting procedures
- Facilitating broadband network deployment by minimizing components of regulatory charges
- Promoting related policies aimed at providing non-discriminatory access at fair prices to telecommunication companies
- Encouraging private sector network expansion by fostering return on investment
- Leveraging mechanisms such as public-private partnerships
- Development of policies to bridge physical and digital infrastructures
- Promoting global standards and interoperability

The G20 should facilitate fair competition, including facilitating existing business operations under competitive rules and encouraging new viable business models

The G20 should encourage markets to develop by enabling fair competition to increase innovation and cooperation, as well as adopting governmental measures to support network investments, leveraging both new and existing business models (which expand network coverage and speed-up roll-out).

The G20 should support network deployment by fostering transparent and efficient permit granting procedures and facilitating broadband network deployment by minimizing components of regulatory charges

Tax incentives, pricing regulations, and long-term technology-neutral licensing have a significant impact on network coverage. To overcome roadblocks of affordability for end consumers, it is necessary to lower network deployment costs by giving access to spectrum at fair prices, simplifying licenses and permits, and minimizing components of regulatory charges (for example, reduce sector specific taxation). Global open standards compliant with WTO/TBT principles for international standards development[26], such as 3GPP, should also be encouraged. Open standards will enable technologies and services to scale and become increasingly affordable, resulting in expansion of mobile communication technology coverage to regions not previously covered. All these efforts will ease upgrades and expansion of networks while at the same time lowering consumer prices.

When it comes to promoting private investments in high-capacity, future-proof digital infrastructures, the G20 should limit the use of direct government interventions to market failures alone. Furthermore, it is critical to make the overall network deployment process easier. It could mean overcoming roadblocks like permitting delays or harmonizing radio frequency exposure values, which could lead to an uneven network deployment. This would simplify and lower artificial entrance barriers, promoting competitiveness.

The G20 should maximize spectrum availability, by ensuring its timely and affordable release, in accordance with domestic laws and legal framework

26 WTO, Principles for the Development of International Standards, Guides and Recommendations, 2000

To expand network reach even further, G20 members should push for policies that give operators access to global or regionally standardized 5G pioneer spectrum. Early allocation of suitable amounts of spectrum has a significant impact on network coverage since it leads to increased network investment. Only 25.5% of 5G spectrum has been released to Member States[27] in Europe for example. The slow pace is attributed in large part to a concentration on short-term profits above long-term advantages. Governments should create the best possible conditions for an investment conducive environment with fiscal policies incentivizing more investments in broadband and making 5G spectrum in low, mid and high bands available in an affordable way.

In addition, spectrum is key in underpinning for the mobile industry and so high spectrum prices will compromise the financial capability of operators to roll out networks. This has a negative impact for the services that customers receive. The G20 can explore efforts to help reduce spectrum prices.

The G20 should make private sector network expansion a priority, also ensuring their neutrality with respect to technologies and business models

Because of existing limitations of network coverage and shortfalls in infrastructure, significant capital investments are required to meaningfully connect more people to the internet[28]. The International Telecommunication Union (ITU) estimates that nearly USD428 billion is required to connect the remaining 3 billion people aged ten years and above to broadband Internet by 2030[29]. As recommended by the OECD, it is fundamental to take timely measures to close gaps in unserved and underserved demographics, while striving to avoid distorting competition, such as through the promotion of demand aggregation in rural and remote areas[30].

Policy makers should put broadband access at the forefront of economic development efforts, with a reconsideration of policies, including fiscal measures, spectrum pricing, technologies, and business models to expand connectivity reach to historically unconnected or underserved populations.

Public involvement in fostering the take-up of high-capacity and robust fixed, mobile, and satellite broadband connectivity, capable of delivering gigabyte speeds, may be encouraged with voucher schemes to underserved households and businesses without distorting competition dynamics, private investments, and existing business models. While respecting the principle of technological neutrality, governments might consider granting vouchers to the best available high-capacity and robust fixed mobile and satellite broadband networks capable of delivering gigabyte speeds with a view to foster their take-up.

The G20 should promote the development of policies to bridge the gap between rural and urban areas, create an entry-point for the excluded to access the digital economy, and mitigate social imbalances by granting meaningful internet access to everyone

The G20 should accelerate the digital development of rural areas and improve its governance by enhancing digital infrastructure and capacity building to bridge the digital gap with urban areas,

27 Ericsson, Digitalization with 5G enables further acceleration of climate action, 2021
28 Broadband commission for sustainable development, State of Broadband, 2019
29 ITU, New ITU sudy estimates US% 428 billion are needed to connect the remaining 3 billion people to the internet by 2030, 2020
30 OECD, Recommendation of the Council on OECD Legal Instruments Broadband Connectivity, amended 2021

thereby reducing inequalities. While practically every city on the globe has a mobile-broadband network, rural areas still have troubling gaps in connectivity and internet access. Globally, according to ITU, 72% of urban households have access to the internet at home, about twice as many as rural households (38%). It is critical to improve infrastructure and network coverage and penetration to close the digital gap. In addition to boosting agricultural productivity, digital technologies can help rural populations by supporting public services (such as healthcare and education) and their governance. Developments in satellite technology, particularly constellations in low earth orbit (LEO), can help bring high speed, high capacity, and low latency broadband connectivity to rural and remote areas that previously were not covered. Also, the development of Fixed Wireless Access, as well as fiber, can support to increase connectivity access to rural communities.

The G20 should promote global ICT standards to facilitate interoperability and affordability

Global ICT standards eliminate costly market conflicts over preferred technology. Global standards also create a level playing field for enterprises from emerging nations to enter new markets. Due to the economies of scale, standards could enable cost reductions for the entire supply chain: manufacturers, operators, and users[31].

31 ITU, ITU-T in Brief

Policy Action 1.3: Ensure higher usage of internet by making internet relevant for users by providing meaningful local content to citizens and accessible to all by ensuring that the cost of devices, internet services and other value chain components do not limit adoption

Digital exclusion is no longer simply about being beyond the reach of infrastructure that makes internet access possible.

Theoretically, 95% of the world's population could access mobile broadband internet, given that they live within range of a 3G mobile network. Although connectivity growth has been remarkable over the last decade thanks to mobile broadband networks, today, around 3 billion people around the world remain offline. The UN Broadband Commission defines internet accessibility as 'one for two': accessible internet is where 1GB of mobile broadband data is priced at 2% or less of the average monthly income. Internet connections in low and middle-income countries have become more accessible, moving from 7.0% of average monthly income in 2015 down to 3.1% in 2019[32], but numerous countries are still facing challenges to reach this goal. According to the Alliance for Affordable Internet (A4AI) 2021 Affordability Report, governments have not taken the required actions to accelerate internet access worldwide in a way that would help attain the Sustainable Development Goals, grow the economy, and help people realize their potential.

Unconnected populations should be the focus of not only G20, but all policymakers and government agendas in the same way that power and water infrastructure were central to development in the 20th century. Connecting everyone is a major issue that will necessitate a multi-stakeholder strategy. This will demand collaboration and cooperation from both the public and private sectors from across the value chain. To bridge the connectivity gap on both the supply and demand sides, a number of private and public sector efforts are needed.

Note: digital literacy, one of the key strategies to ensure technology accessibility, will be covered in recommendation 3 to prevent duplications.

The G20 should make the internet relevant for users by providing meaningful local content on

32 A4AI, Affordability Report, 2020

the internet to citizens e.g., providing content with local language options and in relation to the local culture

To get people connected, it is necessary to find innovative ways to provide meaningful local content to citizens. One way to do this is for content providers to provide content on the internet in relation to the country's local culture, or with the country's language.

Another way to do this is to ensure the process of digitalizing administrations take place and more specifically digitizing the public sector´s interactions with citizens. Additionally, by increasing the capacity and efficiency of the public devices will encourage citizen´s adoption and use of eGovernment services.

The G20 should ensure technology accessibility for all individuals by using public levers such as promoting clear and transparent National Broadband Plans

One solution to address the affordability concern of internet connection is for the G20 to promote the development of National Broadband Plans (NBPs) as policy documents, which can help set effective accessibility targets and target progress periodically, stimulate positive public - private relationships, provide stability for a competitive market to grow, and increase private sector confidence when committing to longer-term structural investment.

Governments should ensure that information and communication campaigns held at national level on available digital means (devices, services, and networks) are homogeneous and synchronous to ensure the same level of awareness, understanding, and support across every layer of the population. On this topic, it is important to build on the existing work, such as the guidelines provided by the International Telecommunication Union (ITU)[33]. Ensuring that technology is equally accessible does not have to be limited only to unserved, remote, or in-need populations. The World Health Organization estimates that 1 billion people live with disabilities[34], and the International Telecommunication Union highlighted the importance of improving their access to ICTs[35], especially considering that assistive technology can be life-changing for disabled individuals[36]. Access to technology should not be restricted by our vision, hearing, mobility, mental health, learning disabilities or cognitive differences; hence, information technologies and communication devices should be designed to be accessible to all.

The G20 should consider public-private partnership initiatives to support broadband development and demand-supporting initiatives

The G20 should consider public-private partnership initiatives to help support broadband development and demand-supporting initiatives, to help more people get connected to the internet.

Options to support broadband development and demand-supporting initiatives aimed at securing affordable connectivity for many could include expanding to all private sector agents benefiting from

33 ITU Guidelines on how to ensure that digital information, services and products are accessible by all people, including Persons with Disabilities during COVID-19, 2020
34 World Health Organization, Disability and Health Report, 2020
35 ITU, Accessibility study group, 2020
36 Forbes, For Disabled People, Access To Assistive Tech Is A Human Right Not An Employment Perk, 2020

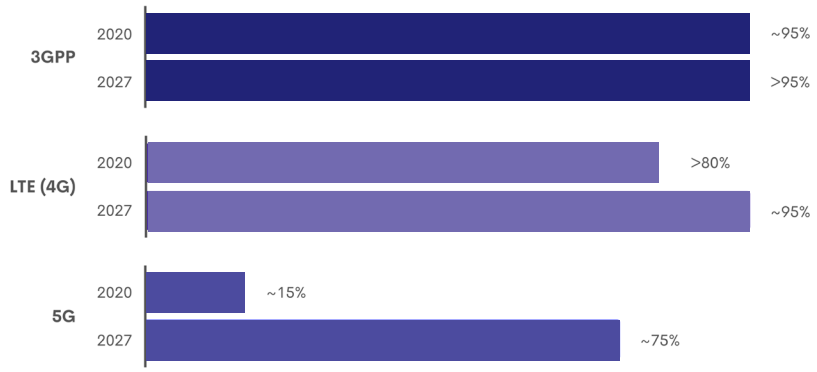
digitalization the obligation to contribute to Universal Service Funds (USF) or to contribute to the costs of delivering the service.

The G20 should ensure that the cost of devices, internet services and other value chain components do not limit its adoption, including but not limited to strategizing around taxation

The financial cost of internet access (to which multiple cost factors across the value chain contribute) are a major hurdle for the disadvantaged and unconnected populations around the G20. Factors such as the cost of equipment and devices required to access digital services and run digital applications are important to consider due to the additional cost of access. Computers, tablets, smartphones, and the power supply required to run them are fundamental components of digital life and need to be accessibly priced so that citizens can take advantage of the connectivity available to them. The G20 must consider the cost for its citizens to tap into the digital economy holistically and not simply focus on one or a few cost components.

The Broadband Commission's State of Broadband Report[37] notes 'the cost of devices is critical in overall total affordability of internet access as mobile internet has become the primary method of accessing connectivity. Largely, those who are not using internet are living within the coverage of a mobile network.

Exhibit 8 | World Population Coverage by Technology



Source: Ericsson Mobility Report, November 2021

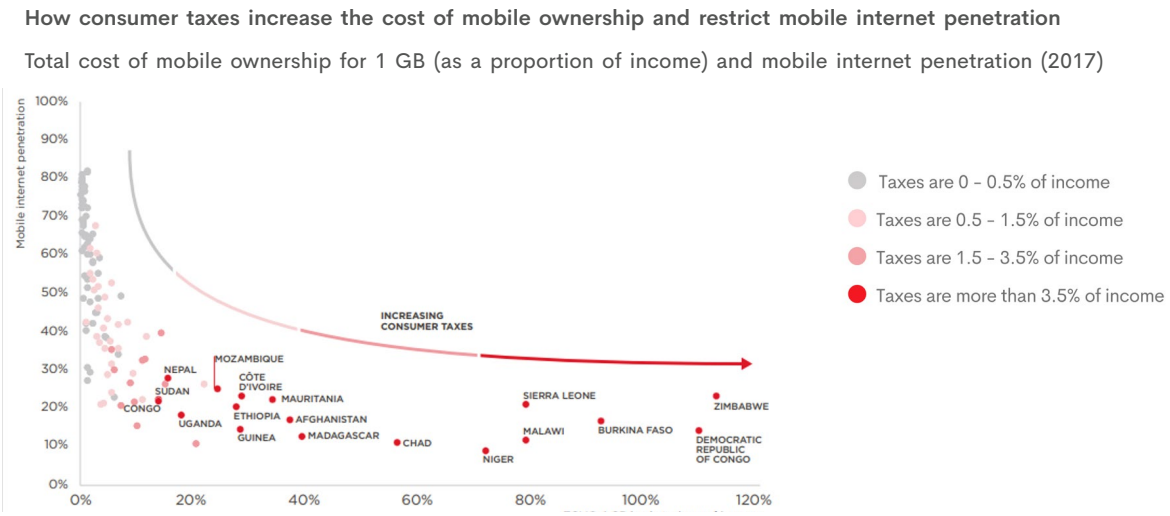
As with technology in general, newer devices are more expensive than older ones, and as more countries expand 4G/LTE networks and pave the way for 5G while concurrently shutting down 2G and 3G services, legacy low-cost devices will need to be replaced with higher cost smartphones. Already, over 2 billion people live in countries where the most affordable smartphones cost more than 25% of average monthly income[38].

In many countries, the import duties and other specific taxes levied on devices and ICT equipment make them less affordable. Hence, governments should bear this in mind when defining their import duties and tax policy to make communication services available to all. ICT consumers and connectivity service providers are increasingly subject to a tax burden which reduces affordability

37 Broadband Commission for Sustainable Development, The State of Broadband: People-Centered Approaches for Universal Broadband, 2021
38 Broadband Commission for Sustainable Development, The State of Broadband: People-Centered Approaches for Universal Broadband, 2021

and lowers investment, widening the digital divide[39], mainly driven by sector-specific taxes. As an example, in the exhibit below, increase in tax generally correlates with negative effects on mobile internet penetration.

Exhibit 9 | Correlation Between Consumer Taxes and Mobile Internet Penetration



Source: GSMA, Rethinking Mobile Taxation to Improve Connectivity

Some examples of best practice strategies that governments can consider doing, according to GSMA's report Rethinking Mobile Specific Taxation:

- *Taxes should be as broad based as possible*: The uptake and use of mobile services grows when these sector-specific taxes are reduced. Reductions in taxation have a favorable influence on government revenues in the medium to long term by expanding the user and tax base. Governments can express their support for the digital connectivity agenda and benefit from economic development as a result of the savings by phasing out sector-specific taxes and levies. This will have a limited negative impact on public finances in the medium term.

- *Tax systems should be simple and certain*: Uncertainty about future taxation discourages investment since future tax increases are factored into investment decisions. Furthermore, a plethora of sector-specific levies charged on various tax bases raise compliance expenses for mobile operators and the tax administration, which might be passed on to end customers as higher prices. Governments should strive to keep tax and charge adjustments as predictable as possible, and to streamline their tax and fee collections.

- *Taxes should not undermine affordability and access to services*: Taxing access to the market is one of the most effective strategies to reduce mobile service adoption. For example, luxury taxes on handsets and SIM cards, as well as import levies on phones, limit access to mobile services. Removing these taxes could boost internet users and enhance the government's taxable base.

39 GSMA, Rethinking Mobile Taxation to Improve Connectivity, 2019

In addition, relatively high fees levied on CSPs such as for spectrum and licenses generally leads to lower quality and less availability of connectivity. With a positive causation between economic growth and network investments, governments should consider carefully how to best strategize around sector specific fees, to not undermine affordability and access to services to close the digital divide.

Governments should (in specific use and need cases) explore demand subsidization for access to the internet and devices, especially for lower-income or disadvantaged citizens, common-good facilities or MSMEs who are eligible. Ideally, eligibility can be identified through digital identity as the basic infrastructure of the nation. Digital identity should be an integral part of e-government design and access.

Strategies to increase access to financing also can be considered for those who are financially disadvantaged to purchase an internet device safely and ethically, such as alternative data for credit assessment, remote locking of handsets, and more flexible payment terms[40].

Beyond device costs, there is a need for countries to address affordability of digital services 'in the round' or end-to-end, including data costs, and content costs from over-the-top providers.

Bringing connectivity to everyone represents a big challenge that will need a multi-stakeholder approach. This will require the collaboration and cooperation of the private and public sectors, as well as operators, device suppliers, regulators, policymakers, vendors, standardization bodies, and open-source communities. A variety of initiatives from the private and public sectors are required to close the connectivity gap by acting on both the supply and demand sides.

40 GSMA, Making Internet Phones More Affordable in Low and Middle Income Countries, 2022

RECOMMENDATION 2

Build foundation for sustainable and resilient digital economy:

Accelerate development of digital infrastructure

POLICY ACTIONS

Policy Action 2.1 – Unlock digital opportunities across the economy at large that prioritize ESG, to enhance competitiveness and drive inclusive growth

Policy Action 2.2 – Encourage open, innovative and coordinated digitalization of governing institutions to enhance public service delivery, through modern innovative business models and regulations

Policy Action 2.3 – Promote adoption of digital infrastructure (cloud, digital identification, digital payment systems, digital signatures, amongst others) and facilitate the importance of data free flow with trust and cross-border data flows on the premise of respecting the domestic legal frameworks of each country

LEADING MONITORING KPI

OWNER: G20 COUNTRIES

	Baseline	Target
% ICT Investments on GDP *Source: World Bank*	**5.0%** *(2020)*	**6.5%** *(2024)*

SDG IMPACT

Recommendation 2 contributes to the achievement of UN's SDG for the goals: 7: Affordable and Clean Energy, 8: Decent Work and Economic Growth, 9: Industry Innovation and Infrastructure, 13: Climate Action

Policy Action 2.1 – Commits to the realization of target **9.2** *(Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries).*

Moreover, the ability to derive value from data would take resource efficiency and production flexibility to the next level, sustaining target **7.3** *(By 2030, double the global rate of improvement in energy efficiency)* and target ***13.3*** *(Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning).*

Policy Action 2.2 – Focuses on enhancing Public Administration's digital skills to set the foundation for a comprehensive digitization of public services, assisting the accomplishment of targets **8.3** *(Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services)*, **9.1** (*Develop*

quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all) and **9.5** *(Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending).*

By promoting common regulatory principles and a fair competitive landscape, assists target **8.3** *(Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises)*

It ultimately enhances the global industrial network in line with target **9.2** *(Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries).*

Policy Action 2.3 – Promoting cross border data flow with trust would promote SDG target **9.1** *(Develop quality, reliable, sustainable, and resilient infrastructure, including regional and transborder infrastructure, to support economic development)*

Strengthening long-term public involvement to stimulate R&D and ensuring a continuous and fruitful cooperation with the private sector would benefit target **9.5** *(Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries).*

G20 INDONESIA PRIORITY IMPACT

Recommendation 2 commits towards the achievement of all three of G20 Indonesia 2022 key priorities: Global Health Architecture, Digital Transformation, and Sustainable Energy Transition by focusing on building a sustainable and resilient economy based through acceleration of digital infrastructure.

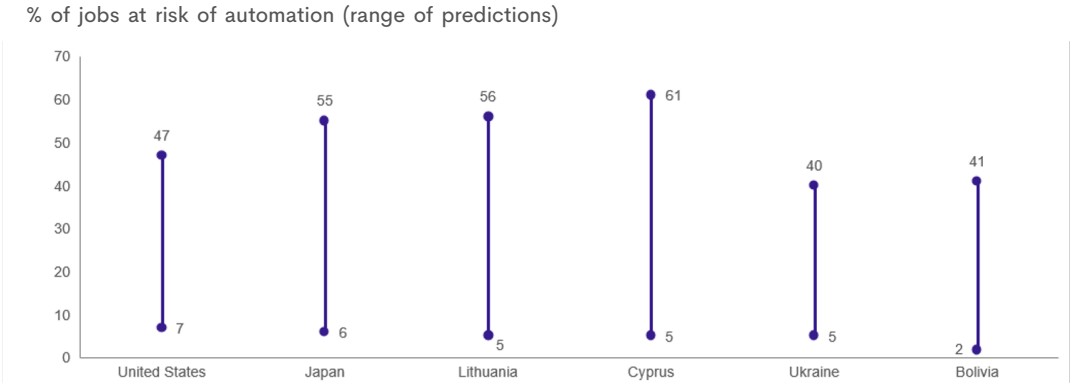
Policy Action 2.1 discusses on unlocking digital opportunities across the economy at large that prioritize ESG, to enhance competitiveness and drive inclusive growth. Therefore, this policy action aims to directly contribute to all three G20 priorities which are, Global Health Architecture, Digital Transformation and Sustainable Energy Transition at the same time.

By encouraging governing institutions to adopt digitalization to enhance public service delivery, **Policy Action 2.2** directly impacts the key objective of Digital Transformation. The increasingly connected population means that governments need to consider digitizing its services, while also improving national security through digitalization.

Lastly, **Policy Action 2.3** which focuses on promoting adoption of digital infrastructure such as cloud, digital ID, digital payment systems, and digital signatures, would impact all three priorities of G20 Indonesia, which are Global Health Architecture, Digital Transformation and Sustainable Energy Transition. This is because implementation of such digital infrastructure would benefit the economy at large.

CONTEXT

Exhibit 10 | Estimates of the percentage of jobs at risk from automation



Note: The figure represent the highest and lowest estimates of the percentage of jobs at risk of automation in economies for which more than one estimate has been produced by different studies. A job is at risk if its probability of being automated is greater than 0.7

Source: World Bank

The digital economy refers to a broad range of economic activities that use digitized information and knowledge as key factors of production[41]. The digitalization of the economy generates new job opportunities, increases productivity, spurs economic growth, and increases efficiency in delivering public services. The digital economy also permeates all aspects of society, influencing the way people interact and bringing about broad sociological changes. However, digitalization also creates a major pitfall for certain workers, especially low-skilled workers. Workers undertaking routine tasks that are "codifiable" are the most vulnerable to replacement[42]. Estimates on the impact of technological progress on job losses vary widely. The range is even wider for advanced economies. In Lithuania, 5% to 56% of jobs are at risk of being automated. In Japan, 6% to 55% of jobs are thought to be at risk[43]. Today, the digital economy is equivalent to 15.5% of global GDP, growing two and a half times faster than global GDP over the past 15 years. COVID-19 is hastening the growth of the digital economy. The unprecedented disruption by COVID-19 is accelerating the urgency for business agility, adaptability, and transformation[44]. An estimated 70% of new value created in the economy over the next decade will be based on digital infrastructure which enables digital-based business models.

The need for digital infrastructure is increasingly important to enhance digital economy transactions. There are several critical digital infrastructures which serve as a fundamental foundation to a successful digital economy, including the digital ID, authentication and digital signature, unified and interoperable data, cloud, big data and artificial intelligence, content (hoax) management, IoT, Blockchain, Security, Digital Payments, and Government API exchange. These infrastructures need to be applied much more broadly to the various sectors of society which are suffering right now due to the pandemic.

We selected four critical infrastructures which are becoming increasingly important to the digital economy: digital ID, big data and AI, IoT, and the cloud.

41 ADBI Institute, Understanding the Digital Economy: What is it and how can it transform asia?
42 World Bank, World Development Report: The Changing Nature of Work, 2019
43 World Bank, World Development Report: The changing nature of work, 2019
44 WEF, Shaping the future of digital economy and new value creation, 2020

First is the digital identification, or "digital ID". Digital ID can be used as a verification tool through digital channels which grant access to banking, government benefits, education, and a variety of other essential services. The hazards for digital ID misuse are significant, which requires careful consideration. Digital ID, when well-designed, provides not only civic and social empowerment, but also substantial and inclusive economic gains. A standardized digital ID coverage could unlock tremendous economic value to countries. It takes several high-value use cases and significant levels of utilization to realize this value, and not all the economic value translates into quantifiable GDP. However, with proper system design and regulations to encourage use and limit dangers, digital ID will be a strong tool for inclusive growth, providing individuals with quantifiable economic value in addition to huge noneconomic benefits.

The second example is the promise of big data and AI. Through machine learning techniques and advanced analytics, big data and AI drive major advances in firms' efficacy and efficiency, including MSMEs, allowing them to better serve customers. The AI market, which has grown fourfold in the last three years, expected to reach USD 2.3 trillion in 2020, is predicted to double in size by 2025, reaching USD 4.5 trillion. During the pandemic recovery period, big data and AI can create significant value in key sectors, such as healthcare (HC). The market size of HC AI is expected to be ten times larger than it was in 2015, according to BCG analysis[45]. In creating and implementing national AI strategies, countries should focus on citizen engagement and collaborative governance. Regular discussions and consultations between government, private sector, academia, and the public will support inclusivity and foster collaboration[46].

The third example we want to highlight is the usage of IoT. Numerous improvements in technology have fueled data proliferation in the last few years resulting in significant business impact[47]. By 2025, IoT is expected to unlock the value of USD 15 trillion in global GDP. Machine-to-machine (M2M) devices, a subset of the IoT, is likely to develop rapidly in the next years, accounting for over half of all devices by 2023, according to projections. The market size is estimated at USD 570 billion by 2023, with a 30% 2015-2020 annual growth rate[48]. Yet, the path to value is still unclear with 68% of business executives thinking business strategy and rational being a key success criterion, one third thinking it will be hard to predict the business value of IoT initiatives, and more than half thinking that changing business models is one of the top challenges in developing IoT offerings[49].

The last example we feel is important to the digital economy is the cloud. Given its cost, capabilities, and flexibility, the cloud is increasingly used by large companies hosting a wide range of applications and platforms. By using the cloud to build and migrate business systems, large enterprises can release their IT team's capacity from managing basic computing infrastructure, such as servers, storage devices, switches, and databases. This allows them to focus on generating more value to the business by leveraging the latest technology and tools[50]. While many large enterprises select the cloud to save money—and they do generally save 15% to 40% of IT operating costs—its primary benefits are increased agility and better performance.

45 BCG, Artificial Intelligence in Healthcare, 2020
46 World Bank, Harnessing trustworthy artificial intelligence: A lesson from Korea, 2022
47 BCG, Internet of Things.
48 BCG IoT Market Model
49 BCG IoT Decision Maker survey
50 BCG, For Many Enterprise Applications, the Cloud Is Ready for Prime Time, 2019

Used in conjunction with one another, these digital infrastructures can unlock significant value for companies and countries. One example of this was the Beijing Olympic Winter Games during the COVID-19 pandemic. High-tech was a concept that was practiced in every aspect of the Beijing Olympic Winter Games, from infrastructure construction, event organization, and venue operation to viewer experience, COVID-19 containment, 5G, cloud computing, big data, satellite navigation, and artificial intelligence.

In the effort to guide the G20 towards a tangible and impactful change, the B20 Digitalization Task Force seeks to draw attention to three key priority actions:

- Unlock digital opportunities across the economy at large that prioritize ESG, to enhance competitiveness, and drive inclusive growth

- Encourage open, innovative, and coordinated digitalization of governing institutions to enhance public service delivery, through modern innovative business models and regulations

- Promote adoption of digital infrastructure (digital identification, tools on consent and authorization such as digital signatures, digital payment systems, the cloud, amongst others) and facilitate safe and orderly cross border data flow with trust based on applicable legal frameworks for privacy and data protection and with the consent of consumers

Policy Action 2.1: Unlock digital opportunities across the economy at large that prioritize ESG, to enhance competitiveness and drive inclusive growth

Countries must focus on adopting digital technologies across their firms and sectors, as well as be open to the trade in services, data regulation, data sharing, investing in skills, reskilling, and ensuring the availability of complementary enabling services, to be better positioned to benefit from the digital wave. This will effectively upgrade countries technological capabilities, allowing them to seize the opportunity to catch-up. Successful technology and digital upgrading, on the other hand, is not a passive, self-contained process, but rather an active, coordinated multi-stakeholder effort.

The G20 should support policies and initiatives to enhance digital service offerings to provide a cross-sectoral boost to the overall economy, allowing businesses to leverage the value of increasing digital engagement

Businesses must harness digital channels to market and provide their products and services as the economy shifts to a digital economy. By extending their market reach beyond physical locations, providing access to new clients and market segments, and providing new channels for existing offerings, digital capabilities enable organizations to achieve new revenue growth through inventive new offers.

The COVID-19 epidemic showed that firms with an online presence can not only survive, but even prosper in the most difficult operating climates. This period of crisis has highlighted the importance of digital skills to overall business resilience, as well as the value of flexibility inherent in a digitally agile organization. Businesses that use digital channels get the rewards of a virtuous cycle of client transactions and personalization.

Hence, the G20 needs to promote policies to adopt innovations to enhance digital service offerings and implementation of digital platforms. By digitizing more aspects of a business, digital service offerings and support platforms will rise in value, unlocking more use-cases such as 1) Commerce: Digital commerce adoption to increase revenue for MSMEs 2) Education: Consistency in learning through e-learning platforms 3) Telehealth programs offering to extend healthcare reach and access

4) Financial Services: Mobile e-wallet adoption accelerating financial inclusion 5) Transport and Tourism: Supporting the tourism industry in migrating to digital platforms.

In addition, promoting fair competition and ensuring international regulatory coherence are essential for creating the optimal climate for digital firms at various stages of the value chain to develop. To create competitive marketplaces and promote innovation, regulatory discrepancies between existing and emerging digital actors must be eliminated, and obsolete regulations must be changed as needed.

Inclusivity is also a key aspect to promote fair competition; we must ensure that markets are open for all groups e.g., incumbent players vs startups, public vs private, urban vs rural. We shouldn't create any obstacles to any of the groups (by gender, ethnic backgrounds, etc.) to enter the market. Markets should remain contestable; hence, competition policies need to be strengthened and updated to the evolving digital era, to ensure that capable entrepreneurs, startups, and potential disrupters can enter the market, scale, and compete with digital incumbents.

One other way to accomplish fair competition and ensure international regulatory compliance, is for the G20 to consider collaborating with international working groups and fora to create ideas and techniques for action across countries and industries.

Digitalization is a critical component of ESG strategies. Technology, data, AI, and cloud computing are accelerants to address the climate crisis, manage social inequality by providing opportunity, and access to everyone. The massive amount of data we need to understand our planet can only be analyzed with modern digital technologies and advanced computing power. Sustainability and digitalization are inextricably linked, with technology being essential for addressing challenges facing the planet and society. Leading companies develop innovative distribution channels that break down economic barriers, allowing them to extend reach, scale, and access for a positive societal impact at a low cost[51]. One example is apps that digitize and make vital goods and services more accessible. Another example would be Google Maps that leverages digitalization to show eco-friendly routes in the US[52].

The G20 should promote policies to help businesses digitize business operations to deliver substantial benefits in productivity, operational efficiency, and cost management

In a fast-moving business environment, digitalization of operations will be a crucial pathway towards cost-efficiency and sustainability in enabling business to scale rapidly, due to its significant productivity benefit potential and overall boost in operational efficiency. Governments can deploy a range of levers across the value chain to help businesses accelerate digitization, including smart finance (such as R&D grants, start-up grants), talent schemes (such as research partnerships, foreign entrepreneur visa, local digital skills and vocational schemes, partnerships between companies and colleges for internships and/or full-time-jobs), smart policies (such as IP protection laws, data access and sharing), and infrastructure (such as university research centers, incubators, tech and sector clusters).

51 BCG, How Tech Offers a Faster Path to Sustainability, 2021
52 Google

Several examples of what governments have done to help businesses go digital include[53]:

- Denmark strives for more agile regulation by: i) developing principles for agile trade and industry regulation, ii) establishing a single point of entry for new business models, iii) conducting a digital check to see if existing commercial regulation is up to date in comparison to neighboring countries, and iv) expanding testing opportunities in fields with high potential for digital growth. Denmark is also proposing tax deductions for wage and salary costs linked with starting and growing a firm, for example, by making the administration of digital business development simpler.

- Australia improves the regulatory market environment by continuing to work on 'digital ready' laws and by encouraging Australia's states and territories to adopt, or recognize as equivalent, each other's regulations and standards to reduce business costs.

- Switzerland lowers legal barriers to new business models by first conducting a "digital test" to identify areas where existing legislation is unnecessary or redundant, and then examining measures to lower legal barriers, such as formal requirements arising from both public and private law, with the goal of lowering barriers to digital business models and improving the digital economy's framework conditions. Switzerland is also working to centralize the communications between public agencies and enterprises to lower the administrative load on firms even more.

- China's government's clear policy direction throughout the previous two decades has identified which industries will be priorities for national development. Various five-year plans provide an overarching industrial direction for areas in which the government is investing in order to stimulate broad industries such as fintech, smart logistics, and export promotion. The government establishes this direction by making necessary public resources available to all private sector stakeholders[54]

In addition, we also note that digitizing business operations can address ESG goals. One use case example mentioned by the World Economic Forum would be Olam International. Olam International, a global agribusiness company with nearly USD 27 billion in annual revenue, launched AtSource, a groundbreaking digital sustainability platform, three years ago, to help the agriculture industry meet its ambitious goals of lowering greenhouse gas emissions, reducing waste, and improving farmer livelihoods. Customers can track their products' origins using AtSource, which also assesses the supply chains' environmental and social impact and provides recommendations for how to improve them. Customers can track more than 20 ingredients from farm to factory across more than 60 supply chains, and in many cases, they can trace crops back to specific farmer groups, assessing the environmental footprint of a single crop by volume, origin, and destination[55].

The G20 should promote adoption of accepted global standards and maximize existing initiatives to encourage non-discriminatory and interoperability, while fostering a business environment that facilitates investment and competition on an equal footing

The G20 should encourage the adoption of global standards (e.g., ISO certifications), to encourage

53 OECD, Firms Going Digital, 2021
54 World Bank, What can Indonesia learn from China's digital economic transformation?, 2022
55 World Economic Forum, 3 ways digital technology can be a sustainability game-changer, 2022

non-discriminatory and interoperability in the digital economy. These international standards should be used as a basis for technical regulations. Countries may carve out exceptions where such standards are not aligned with the legitimate objectives (e.g., fundamental geographical factors). Countries may refer to the WTO Technical Barriers to Trade (TBT) Agreement as a basis for this recommendation.

One example would be ICC standards map for corporates and MSMEs, that sets out the interoperable digital standards across the whole trade ecosystem, which allows end users to enjoy more efficient digital trade.

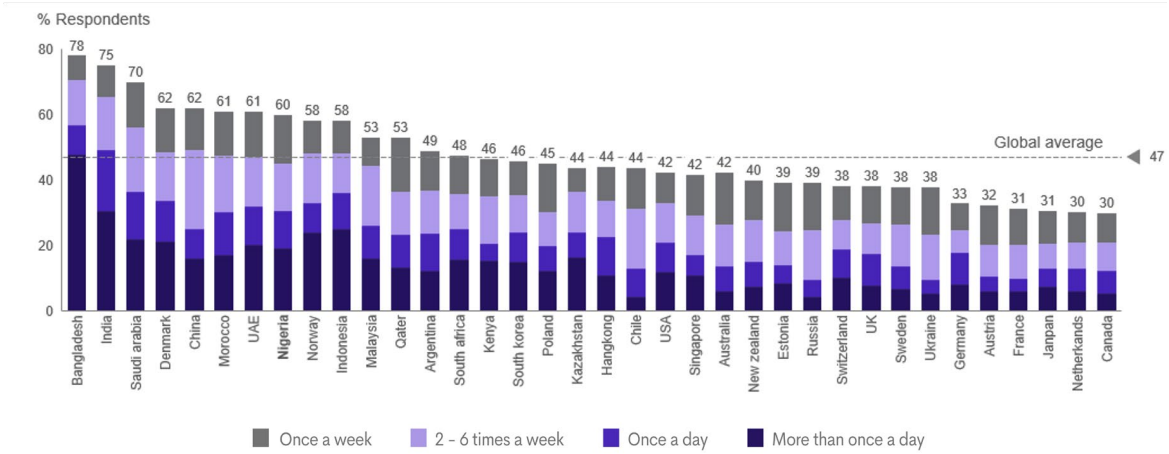
The G20 can also promote existing global initiatives such as the electronic World Trade Platform (eWTP), a multi-stakeholder project driven by the business sector to encourage public-private collaboration. The eWTP initiative is in the final B20 Policy Report and has been expressly recognized by the G20 Trade Ministers in the Strategy for Global Trade Growth.

Policy Action 2.2: Encourage open, innovative and coordinated digitalization of governing institutions to enhance public service delivery, through modern innovative business models and regulations

The G20 should consider digitizing government services, as it will be crucial to meeting the needs of an increasingly connected population, while also maintaining national security

Digital adoption has become common, raising society's expectations for digital government services and its speed. Citizens are increasingly accessing digital government services at least once per week with increased citizen satisfaction, especially in Bangladesh, India, and Saudi Arabia, in developed and developing countries[56].

Exhibit 11 | Percent of respondents that access digital government services at least once per week



Q. How often do you access government services online? Response option: more than once a day, once a day, 2 - 6 times a week, once a week, 1 - 3 times per month, less than once per month, once every three months, customers who selected once a week or more frequent have been included in these charts

Source: BCG, Digital Government Citizen Survey, 2020

56 BCG 2020 Digital Government Citizen Survey

Exhibit 12 | Comparison of satisfaction with digital government service in 2020 to previous survey in 2018

Q. How satisfied are you with the use of the internet in delivering each kind of government service? Net satisfaction reflects total satisfied less total dissatisfied

Source: BCG, 2020 Digital Government Citizen Survey

COVID-19 has accelerated the need for a digital transformation, with 80% of public sector agencies surveyed by BCG feeling the need being more urgent[57]. Getting the digital agenda right presents a great opportunity to build trust and confidence among citizens in government agencies. Great customer experience increases trust in the public sector, as the 2020 BCG Digital Government Citizen Survey shows[58]. As a result, the G20 should change service delivery to match increasing expectations for digital service, speed, and depth. Digital technology facilitates a more responsive and effective government[59]. Digital transformation can unlock significant value for governments through supporting policy and enabling new services and business models, improving citizen experiences and trust through better service delivery, and improving quality and reducing cost through more efficient operations. Digital governments can also give citizens a voice and opportunity to collaborate in dealings with government, federal agencies, and stakeholders across the board. Digital government initiatives could focus more on multifunctional citizen participation platforms to deepen the citizen-government relationship through effective CivicTech solutions, improve accountability, and build public trust in government[60].

In addition to ongoing digital transformation initiatives within ministries and agencies, whole-of-government (WOG) initiatives to standardize common applications will enable the government to save money, collaborate, and share data more effectively to better serve citizens and businesses. Governments can digitize multiple functions such as licensing and permitting, customs, tax, and procurement, as well as many more. There is a range of example initiatives which could be introduced to enhance government-to-citizen/business services such as developing one-stop citizen/business portals to enhance ease of accessing government services through digital means. This will allow the streamlining of business investment by digitalizing licensing and permitting processes, enhancing digital

57 BCG, Public Sector Data & Digital Platform Playbook, 2020
58 BCG, Digital Government Citizen Survey, 2020
59 BCG, Public sector data & digital platform playbook
60 World Bank, GovTech Maturity Index, 2021

tax filing and payment capabilities to simplify processes, expand e-procurement to e-marketplace to enable MSME participation, implementing Cloud Service Providers (CSP), amongst others. We also call upon the G20 members to ensure national interoperability of data across government entities.

We also note that commitment at high levels of government and the allocation of necessary resources are crucial for the sustainability of GovTech initiatives[61]. Governments need to consider the broad array of public services, efficiency, and risks of exclusion when digitizing their services, making sure that "nobody is left behind".

To achieve this ambitious goal on digitizing government services, governments can explore public-private partnerships to provide the best possible services for citizens.

The G20 should promote activities to digitize legislative and judicial processes, with the objective of boosting the efficiency of the legal process, while providing a more transparent, open system for citizens

The G20 should be dedicated to open transparent stakeholder participation in law development. Digital technologies provide a scalable platform for the government to consult stakeholders safely and quickly, promoting public conversation and participation in the process. Digitalizing legislative processes not only enables increased citizen engagement, but also promotes public awareness of the national regulatory process and allows stakeholders such as Members of Parliament (MPs) easier access. It is necessary to implement digital technologies to better manage and simplify the demands placed on the court system.

Examples of initiatives to digitalize legislative and judiciary processes include e-Rulemaking implementation to enable public consultation on legislation, development of digital engagement programs to boost communication with the legislative body of government, implementation of integrated e-litigation systems to increase transparency and efficiency and establish virtual courtrooms and hearings.

61 World Bank, GovTech Maturity Index, 2021

Policy Action 2.3: Promote adoption of digital infrastructure (cloud, digital identification, digital payment systems, digital signatures, amongst others) and facilitate the importance of data free flow with trust and cross-border data flows on the premise of respecting the domestic legal frameworks of each country

We urge the G20 to harmonize regulations, explore mechanisms to increase interoperability and increase collaboration between public and private sectors in creating fundamental building blocks for digital infrastructure. Additionally, the G20 should promote responsible, sustainable, people-oriented, safe, and orderly development, and facilitate trust in cross-border data flows. The G20 should encourage cross-stakeholder's dialogue including academia, communities, and private sectors such as banks and fintech to discuss the most effective approach in the application of digital infrastructure. Government should provide wider opportunities for various parties to participate in this project if it's aligned with the needs in a transparent and accountable manner.

The explanation of proposed call-to-action to the G20 is below.

The G20 should support the design of policies aimed at promoting digital identities as a building block for data privacy and digital trust

The G20 should support the design of policies aimed at promoting digital identities as a building block for data privacy and digital trust, ensuring the right incentives to enhance their interoperability across borders and sectors, public and private environments.

Digital identities encompass a broad category of electronically acquired and stored data that includes everything from legal digital identities and credentials to alternative data like social media habits, digital payment patterns, and mobile usage statistics. Governments, financial institutions, digital platforms, and international organizations can use digital identities to promote inclusiveness in the digital economy while simultaneously preserving data privacy. These data should be viewed with a customer-centric perspective and consider a cross-sectoral approach to ensure that all relevant data from the customer can be leveraged for their own benefit, with the customer's consent.

While facilitating communications between public administrations and citizens for common activities like tax monitoring and payment, access to personal medical information, and general interactions with public administrations, digital identities can also be a crucial tool for sustaining e-government development on sensitive features like digital voting. Digital identities have also recently proven to be highly impactful when it comes to ensuring safe travel during the COVID-19 crisis through interoperable COVID-19 Vaccination Certificates. It is the use of digital ID COVID-19 certificates that has allowed individuals to freely move without major restrictions upon evidence of vaccination and/ or a negative COVID-19 test[62].

Digitalization and mutual recognition of procedures and documents should make compliance with regulations and market access cheaper and simpler. As a result, we urge the G20 to study ways to expand the implementation of this solution while keeping in mind the requirements for such mechanisms to be implemented in a worldwide, harmonized, and mutually acknowledged framework.

The G20 should promote awareness, and increase collaboration between public and private sector to enhance interoperability of tools promoting Consent and Authorization such as digital signature and strong authentication platforms to promote trust in the digital ecosystem

The second area are tools for consent and authorization, such as digital signatures. Digital and electronic signatures are critical for enabling digitization and moving away from paper-based processes. Many G20 economies have eSignature laws in place, but they are often not fully effective, either because they are limited in scope, not recognized by relevant institutions and/or also require physical documentation/in person attendance. Amending legal and regulatory frameworks to make these laws effective could unlock significant economic value.

Given the fundamental need for secure and accurate online identification and authentication, trust services—such as e-signatures—form part of the core foundation or a "stack" needed for successful digital economies which provide the means to move towards creating productivity gains, reducing corruption and fraud, and further improving user convenience.

Hence, to promote trust in the digital ecosystem, the G20 should promote harmonization of standards as practicable, raise awareness through communication campaigns on available trust services, and increase collaboration between the public and private sectors to improve interoperability of tools that promote consent and authorization, such as digital signatures and strong authentication platforms.

The G20 should adopt action plans to realize the benefits of inclusive digital payments systems through several actions such as digitizing government payments and actively engage in the regulatory agenda

Integrating digital payments into emerging and developing economies solves important challenges such as broad economic growth and individual financial empowerment[63]. In emerging economies, digital payments provide immediate benefits to both senders and receivers, as well as the ability to expand citizen access to affordable financial tools. Women's financial independence is also enhanced

62 Zetes, Movisana
63 World Bank ID4D, Practitioner's Guide, 2019

by digital payments, which free them from the constraints of a cash-only economy and connect them to the financial mainstream. The use of digital payments instead of cash for remittances benefits poor individuals in emerging nations and adds to financial development. This could also help ease worries regarding remittance transparency and traceability.

Hence, we call upon the G20 to adopt action plans to realize the benefits of digital payments, through several call to actions[64]. Firstly, to digitize government payments and receipts, including social transfers. This creates a foundation upon which the private sector can build, including for person-to-person payments, such as international and domestic remittances.

Second, to engage actively on the regulatory agenda, governments need to encourage regulators to enable digital financial services by fostering competition, ensuring consumer education, and fostering business model innovation.

Third, to encourage public and private sectors to continuously improve basic technical payment platform infrastructure, by which providers can compete on product development. Public and private sectors can converge around a payment platform to enable innovation and competition in financial services.

Fourth, to create an enabling environment that fosters private-sector innovation. Governments need to offer a clear vision and tangible incentives to ensure that the private sector is an effective, competitive, transparent, and efficient partner.

Fifth, to recognize the role of remittance providers in offering a digital entry point to formal financial services for senders and receivers. Instead of remittances being cashed out, remittances sent to a bank account, e-wallet, or smart card, for example, can go into accounts that support safe saving and increase transparency and traceability.

The G20 should promote usage of the cloud within public and private entities

Most people associate the cloud with data storage and processing – but today, the cloud is the foundation for most of the advanced technology that will shape our future, including artificial intelligence, IoT, and quantum computing. As countries continue to recover from the COVID-19 pandemic, cloud technology has benefitted many communities because of its high degree of efficiency, agility, and ability to enable businesses and technology to operate seamlessly across borders. It has also brought about benefits for inclusivity by democratizing access to technology. Cloud infrastructure has served as the backbone for several technologies and innovations globally, and it has given businesses of all sizes – including startups and small and medium enterprises – access to tools that were once only available to much larger enterprises. Hence, we urge the G20 to promote cloud adoption in both the private and public sector. One way of doing this could be introducing policies such as the cloud First Policy.

One critical theme in cloud infrastructure that governments need to consider relates to the public vs private models. Public cloud services are open to multiple customers, while private clouds are not

64 World Bank, Digital Payments Vital to Economic Growth, 2014

shared. Consequently, private clouds are more expensive in terms of both capital and operational expenditure. These high costs have contributed to a growing trend of hybrid cloud solutions, which enable customers to integrate with — and benefit from — features of both models. While hybrid models and multi-cloud approaches have much to offer, governments in developing countries should evaluate these factors within their own national contexts to determine which approach best suits their needs[65].

The G20 should promote policies and increase collaboration to build R&D capabilities and ensure that R&D efforts effectively translate into tangible impacts as part of efforts to develop advanced capabilities in digital infrastructure, such as the application of blockchain

The G20 members should be encouraged to develop R&D national agendas aimed at improving innovation and advanced capabilities in digital infrastructure which are digital ID, authentication, and digital signature, unified and interoperable data, cloud, big data and artificial intelligence, content (hoax) management, IoT, blockchain, security, digital payments, and government API exchange. Hence, agendas should present clear policies on how to promote and support private R&D investments (e.g., procurement programs, grants, R&D tax credits), and rigorous accountability in governance mechanisms.

The G20 should aspire to increase countries' R&D intensity by providing appropriate incentives to the private sector, which possesses the technical knowledge and agility to respond to rapid technological advances.

G20 members should be encouraged to create platforms, contests, and events to stimulate public-private cooperation and use public-owned competence centers to promote a business-driven approach to R&D. Governments must also address how innovation occurs in the modern economy, creating incentives to make intangible assets and services such as data sets, data analytics, and cloud computing technologies more accessible, based on common values and rules and refrain from data localization requirements. Investments in secure data processing environments and storage is a key prerequisite to establish trustworthy transactions of data between public and private entities. Furthermore, the level of data literacy and highly skilled professionals in both public and private sectors must be a joint priority for governments.

The G20 should also consider promoting competence centers (or "center of excellence" hubs) for digital platforms and enablers such as artificial intelligence to coordinate efforts for sustainable development, focusing on MSMEs.

It is critical to create the proper development environment for start-ups and to incorporate them as significant actors in national R&D agendas to further stimulate innovation. Indeed, start-ups cover 20% of employment across OECD countries[66], and represent a strong catalyst for innovation and new products or services development. The G20 must also ensure that R&D efforts effectively translate into tangible impacts as part of efforts to develop advanced capabilities in digital infrastructure. As one example, research finds that the use of distributed ledger technologies (DLTs), such as

65 World Bank, Connecting Developing Countries to the Cloud, 2021
66 DynEmp: Measuring Job Creation by Start-ups and young firms, 2020

blockchain, in global value chains has the potential to offer greater transparency and accountability for consumers, according to the G20 Italy Presidency's Blockchain in Global Value Chains: G20 Collection of Practices and Examples. However, companies, particularly SMEs, face barriers in adopting DLT-based solutions. Current research has emphasized the benefits and challenges that DLTs present, particularly in developing nations, and can help throw light on experiences and practices among G20 governments, enterprises, and other stakeholders[67].

The G20 should support more infrastructure investments and public-private partnership on digital initiatives to detect fraud

According to the United Nations every year an estimated USD 1 trillion is paid in bribes and USD 2.6 trillion stolen through corruption. Together, this sum represents 5% of annual global GDP. The inverse link between corruption and successful development outcomes has been well established: corruption deters investment and impedes economic growth, exacerbates income inequality, increases the cost of government services, lowers trust in government, and increases political instability.

Effectively responding to such conditions requires the services of highly qualified, diligent, and ethical development professionals, ideally trained in anti-fraud measures, and equipped with digital tools to detect and prevent it. Also required are the development of effective emergency procurement procedures, more intensive background checks on suppliers and more intensive, independent inspections of received goods and services.

However, we understand that poor infrastructure, such as the lack of computing power to process related data and applications involved in detecting fraud, remains to be one of the key barriers to successful implementation of digital anti-fraud strategies. Hence, we urge the G20 to invest more on infrastructure enabling these strategies.

In addition, we encourage the G20 to enable public-private partnerships to accelerate successful implementation of digital anti-fraud strategies. One example of public-private partnerships will be India's Cyber Surakshit Barat program, where leading technology firms (e.g. Microsoft and Amazon Web Services) partner with India's Ministry of Electronics & Information Technology to train public sector staff on cybersecurity, including fraud prevention.

The G20 should enable safe and orderly cross-border data flows with trust based on applicable global, regional, and domestic legal frameworks for privacy and data protection

Data access and sharing is estimated to generate social and economic benefits worth between 0.1% and 1.5% of GDP in the case of public sector related data, and between 1% and 2.5% of GDP when accounting for private sector data[68]. According to OECD, data access and sharing can generate a wide range of benefits outside of economic benefits, such as enhancing social welfare and well-being, improving evidence-based policy making, public service design and delivery, increasing transparency, accountability, and trust across society, and empowering users of digital goods and

67 Declaration of G20 Digital Ministers. Leveraging Digitalization for a Resilient, Strong, Sustainable and Inclusive Recovery, 2021
68 OECD, Enhancing Access to and Sharing of Data: Reconciling Risks and Benefits for Data Re-use across Societies, 2019

services, including enterprises, workers, citizens, and consumers[69].

Despite an increased need for data and evidence of its economic and social advantages, data access and sharing have yet to reach their full potential, hence the need to promote cross border data flows with trust. Accordingly, the G20 should promote and encourage principles such as Data Free Flow with Trust, which was launched by the G20's heads of government under Japan's leadership in 2019[70]. As discussed in G20 Saudi Arabia, cross border data flows with trust should follow lawfulness, transparency, fairness, and reciprocity as its key principles. Cross border data flows with trust need to also be in compliance with each nation's data protection rules. In addition, efforts should be made to harmonize global, regional, and domestic legal frameworks. Trust in data transactions is sustained by a robust, legal, and regulatory framework encompassing both safeguards, which prevent the misuse of data, and enablers, which facilitate access to and reuse of data[71].

The term safeguards refers to the trust environment around the collection and use of data. It includes supporting individuals' agency—that is, their ability to exercise control—over how their personal data are used, with respect to rights to know and transparency, access to data, correction, deletion, and portability. Safeguards also address how data is stored and accessed, as well as the responsibilities of those who collect, process, or use data to take steps to maintain data integrity and preserve data rights, such as intellectual property rights and other restrictions on the use of nonpersonal data. Personal data, nonpersonal data, and mixed data are the main categories under which safeguards are evaluated. The sensitivity of these sorts of data varies significantly, resulting in a variety of legal methods. Implementation of safeguards must differentiate between personal data, data requiring a rights-based approach with individual protection, and nonpersonal data, allowing a balancing of interests in data reuse[72].

The G20 can also introduce enablers for data-sharing. Some recommendations for strengthening enablers include[73]:

- Construct a solid but adaptable framework for electronic transactions. With a few exceptions, digital transactions should be seen as legal equivalents to analog transactions. To guarantee a fair playing field for a wide range of techniques to authenticate transactions and related trust services, robust authentication should be technology agnostic.

- Adopt open standards and licensing that encourage sharing. Open access to data developed by the public sector for public purposes should be strengthened by policymakers, including the implementation of open standards and sharing-friendly licensing.

- Strengthen the provisions governing access to information. Legislation governing access to information should be amended to include the proactive and transparent disclosure of non-sensitive data. Exceptions to the rule of transparency will be required, and they should be reasonable. Regular public publication of ATI requests received and rejected, as well as reasoning for any

69 OECD, Enhancing Access to and Sharing of Data: Reconciling Risks and Benefits for Data Re-use across Societies, 2019
70 Final G20 Osaka Leadership Declaration
71 World Bank, Data for Better Lives, 2021
72 World Bank, Data for Better Lives, 2021
73 World Bank, Data for Better Lives, 2021

refusal, should be a requirement of ATI laws, ideally on an open platform.

- Encourage data and system interoperability. Improving data use and sharing will necessitate the creation and implementation of uniform technical standards to promote data and system interoperability. Adoption of common technical protocols and a government interoperability platform are required for system interoperability. Data can be made interoperable by ensuring that it is categorized, processed, and released in a machine-readable format according to the agreed standards. Despite these benefits, the data exchange and links between systems poses risks to privacy and data security. To mitigate these risks, some systems limit data sharing to the absolute minimum necessary or prohibit the propagation of a common unique identifier in order to reduce the ability to link information across databases. At a minimum, strong legal, regulatory, and governance structures—along with data subject to consent and security and access controls to prevent data theft and regulate authorized use—must be in place to ensure that data transfers or other interoperability measures do not infringe on individual rights with regard to privacy and do not unduly put personal data at risk of theft or misuse[74].

- Encourage data portability. Data should be in a structured, generally used, and machine readable format to reinforce the right to data mobility. Where proportional and technically viable, interoperable data and systems can assist in achieving continuous data portability. Personal information management systems can let users obtain and manage their data as an alternative or supplement to direct portability, although their use is currently limited. Adequate market competition, which allows users to transfer providers, is required for the implementation of data portability rights. In order for data portability to be useful, it must also address data subjects' lack of understanding of their rights, as well as the implementation issues faced by micro, small, and medium businesses. In addition, careful and polite discussions should be held from a wide range of perspectives such as consumer needs, corporate merits, and practical burdens, industrial policies, and evaluations (i.e. in Europe where the system has already been introduced). It's vital to remember that data portability should not be applied universally across all businesses; instead, it should be considered primarily in fields like healthcare, where demand is high and public acceptance is relatively easier to obtain.

- Encourage the sharing of personal intent data. Governments can encourage private sector data sharing by developing data sharing agreements and strengthening intellectual property rights. These techniques, taken together, can assist in diminishing the incentives for data hoarding while also maximizing data reusability. Governments should increasingly consider legislating private sector data sharing, subject to appropriate conditions and protections, as discussed in the World Bank's Data for Better Lives report.

- Encourage the ability to transfer data, including through the development of shared principles for trusted government access to data as is being developed by the OECD.

We also note that creation of a trust environment remains a work in progress worldwide, especially in low-income countries. There is no one-size fits all legal and regulatory framework. Hence, we

74 World Bank, Interoperability, Identification for Development, 2019

also urge the G20 to ensure that the design of suitable safeguards and enablers may have to be carefully adapted to local priorities and capacities[75].

In addition, the G20 can also explore how to provide platforms for best-practice sharing across G20 countries and other partner countries on data protection and data privacy standards and implementation.

The establishment of a well-functioning data governance framework within each nation should be encouraged. A well-functioning data governance framework ensures that infrastructure, laws, economic policies, and institutions work together to support the use of data in a way that aligns with each society's values. Such a framework should also clearly differentiate between personal data (data that identifies the individual) and nonpersonal data (data that does not contain any personally identifiable information). The protection of personal data is grounded in international human rights law, which requires that the interests of the data subject be adequately safeguarded before enabling any kind of data transaction. This protection is usually achieved by compelling the subjects of data to provide some form of explicit consent for use of the data[76].

For users to truly benefit from the opportunities their data could offer, a broader framework needs to be developed beyond the siloed approach of specific sectors. This concept is also supported by the European DATA Act, intended to ensure fairness in the allocation of value from data among actors in the digital economy and to foster data-sharing across sectors[77].

75 World Bank, Data for Better Lives, 2021
76 World Bank, Data for Better Lives, 2021
77 World Economic Forum, What impact will the EU Data Act have on the digital economy?, 2022

RECOMMENDATION 3

Ensure digital ready mindset for individuals and Micro, Small, and Medium Enterprises (MSMEs), and enabling MSMEs through access to digital platforms:

Fostering tech-enabled workforce and companies

POLICY ACTIONS

Policy Action 3.1 – Define specific desired practical outcomes in mindset by level of education (Primary, secondary, tertiary) for individuals, while promoting use of digital equipment and solutions to enhance learning experience

Policy Action 3.2 – Improve individuals' technical digital skills through continuous education, involving multistakeholder cooperation, to increase their propension to use digital products and services and ability to navigate the cyberspace safely and mindfully, especially for MSMEs, however applicable across all companies at large

Policy Action 3.3 – Accelerate responsible innovation and digital adoption, especially in MSMEs, however applicable across all companies at large, by promoting policies to provide access to digital platforms that can help build competitive markets

Policy Action 3.4 – Increase efforts to provide sustainable and fair financing to MSMEs to adopt digital technologies

LEADING MONITORING KPI	OWNER: G20 COUNTRIES	
% STEM Graduates over Total Graduates *Source: OECD, EUROSTAT*	**Baseline** **26%** *(2019)*	**Target** **30%** *(2024)*
% of small-medium companies using website for business related activities *Source: World Bank Enterprise Survey*	**Baseline** **64%** *(2019)*	**Target** **74%** *(2024)*

SDG IMPACT

Recommendation 3 contributes to the achievement of UN's SDG for the goals: 4: Quality Education, 8: Decent Work and Economic Growth, 9: Industry Innovation and Infrastructure, 10: Reduced Inequalities

Policy Action 3.1 – Calls for the reform of education curricula with the aim of including the digital skills required to address the needs of the forthcoming digital workforce, contributing to target **4.4** *(By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship).*

Finally, **Policy Action 3.1** calls for the urgency of ensuring equal access to digital and technology trainings to all, covering target **10.2** *(By 2030, empower and promote the social, economic and political*

inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status).

Policy Action 3.2 – Aims at reducing the current digital skill gap by training and educating workers and individuals. Both processes will support the improvement of labor conditions across sectors, contributing to the achievement of target **8.3** *(Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services).*

Moreover, ensuring the creation of a competent digital workforce in the future support the achievement of targets **8.1** *(Sustain per capita economic growth in accordance with national circumstances and, in particular, at least 7 per cent gross domestic product growth per annum in the least developed countries)*, **8.2** *(Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labor-intensive sectors)*, **9.1** *(Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all)*, and **9.5** *(Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending).*

PA 3.2 would also act on targets **9.1** *(Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all)* and **9.4** *(By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities).*

Nurturing use cases sharing within relevant industries would support new technology development, knowledge acquisition and best practices accessibility, even for MSMEs, thus, supporting a more inclusive innovation and ultimately benefitting target **9.2** *(Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries).*

Policy Action 3.3 – Policies that provide access to digital platforms impact target **9c** *(Significantly increase access to information and communications technology and strive to provide universal and affordable access to the internet in least developed countries by 2020).*

Furthermore, the result of equal access would also directly impact target **9.2** *(Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries).*

Policy Action 3.4 – Focusing on finance access to MSMEs would directly impact SDG target **9.3** *(Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets).*

G20 INDONESIA PRIORITY IMPACT

Recommendation 3 commits towards the achievement of all G20 priorities, which are Global Health Architecture, Digital Transformation and Sustainable Energy Transition.

Policy Action 3.1 focuses on define specific desired practical outcomes in mindset by level of education (Primary, secondary, tertiary) for individuals, while promoting use of digital equipment and solutions to enhance learning experience. Hence, this directly contributes to the key priority of Digital Transformation. The education defined here includes education at the university level, hence, this also includes the healthcare industry, which directly contributes to the Global Health Architecture key priority.

Policy Action 3.2 focuses on improving individuals' technical digital skills through continuous education, across all industries. Hence, this policy action directly impacts the achievement of all G20 priorities, which are Global Health Architecture, Digital Transformation and Sustainable Energy Transition.

Furthermore, **Policy Action 3.3 and 3.4**, focus on enabling MSMEs by promoting enabling policies for innovation and technology adoption as well as providing fair financing. These policy actions further support the key prioritiy of Digital Transformation for MSMEs. These policy actions will indirectly contribute to the Sustainable Energy Transition priority as well.

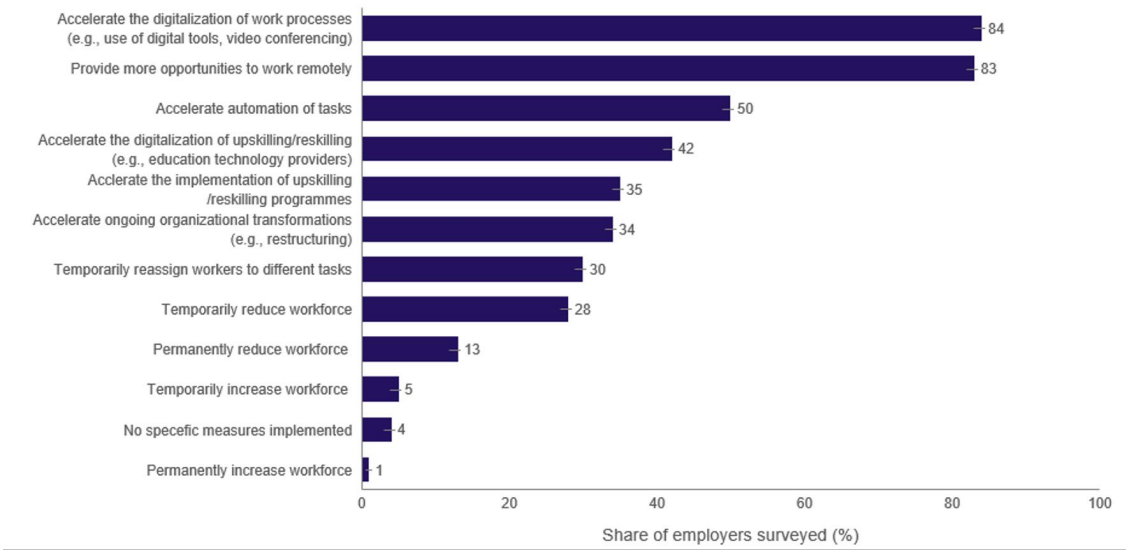
CONTEXT

From simple internet browsing and emailing to specialized programming and development, digital skills are defined as a range of abilities to use digital devices, communication applications, and networks to access and manage information[78]. They enable people to create and share digital content, communicate, and collaborate, to solve problems for effective and creative self-fulfillment in life, learning, work, and social activities at large.

Entry-level digital skills can include computer literacy, data entry, social media, web-based communications and research, word processing, email and chat, and secure information processing. While advanced digital skills can include programing development, digital business analysis, digital marketing and content creation, digital design and data visualization, digital product management, data science, and user experience design.

As seen by the widespread use of digital-first activities such as remote work, online commerce, and virtual collaboration, digital skills have never been more important to business and the workforce, especially during the COVID-19 pandemic. As seen from the Future of Jobs Survey by the World Economic Forum, employers are planning to adapt their businesses by enhancing digital enablement. While this development has numerous advantages, such as increased worker flexibility and the removal of geography as a barrier to employing fresh talent, it has also resulted in the worsening of an already significant skills gaps. Increasing digital inclusion and access to digital employment and education opportunities is essential. There is a danger of a new divide opening between the types of workers who can perform their roles remotely and those working in industries, or living in countries, where that isn't possible. We need to continue working together on a global scale to achieve universal broadband connectivity for everyone.

Exhibit 13 | Planned business adaptation in response to COVID-19



Source: World Economic Forum, Future of Jobs Survey

78 UNESCO, Digital skills critical for jobs and social inclusion, 2018

The digital skills gap means there's just not enough people with the right digital skills to power companies' transformation now and in the future. The economic implications of the digital skills gap are massive. Research from Salesforce and RAND Europe shows that the digital skills gap is disruptive to business growth, citing that 14 of the G20 countries could miss out on USD 11.5 trillion in cumulative GDP growth[79].

Rethinking digital education must become a priority for policymakers for two reasons: first, the role of education is a prerequisite for future global competitiveness to bridge the digital skills gap; second, only a fair education system can provide the right preconditions for social inclusion in the digital era.

Digital literacy does not have to be limited to technical and practical capabilities but should focus also on basic skills, especially for the youngest. Children today spend more time online and interact with the digital environment through a range of devices for a variety of reasons. As an example, according to recent estimates by OECD, one in every three internet users in Europe is a child, and children in Europe spend between 134 and 219 minutes every day online[80]. The impact of rapid technology advancements on children emphasizes the importance of policy that keeps up. Beyond discrete duties like research or teaching, the digital environment provides youth with a wide range of options and benefits, including entertainment, communicating with friends and family, and expressing their creativity in more diversified ways. These enormous prospects come with a changing risk landscape that has changed considerably in recent years. Sexting and fake news, for example, have emerged as hazards to children, while existing risks, such as cyberbullying, have evolved in scope and character. To avoid negative impacts on their cognitive, social, and emotional development, effective interventions such as trainings and awareness campaigns aimed at children and their guardians are required.

Other than literacy, we note that MSME digital enablement is also a key challenge to tackle. In most emerging and developed nations, MSMEs are a key engine of job creation and economic activity[81]. Although specific figures are difficult to come by due to the fragmented nature of global data and differing definitions of MSMEs, formal and informal MSMEs account for 60 to 70% of GDP in low-, middle, and high-income nations, respectively. They employ more than half of the world's population and account for more than 90% of all enterprises. MSMEs are key vehicles for social inclusion in their communities, and they contribute significantly to job growth, particularly in developing nations. Younger companies, particularly those with less than 20 employees, are the most important drivers to global job growth.

For MSMEs, labor productivity growth is substantial. According to World Bank estimates, 600 million new jobs would be required by 2030 to absorb the rising global workforce, with MSMEs accounting for nine out of ten new jobs created globally. MSMEs are also deeply rooted in their communities, and they frequently give opportunities for women and other underrepresented groups to participate in economic activity.

We also note that MSME enablement brings domino effects to the community and businesses around

79 WEF, Future of Jobs, 2020
80 OECD, Education in the Digital Age: Healthy and Happy Children, Educational Research and Innovation, 2020
81 GPFI, Promoting digital and innovative SME Financing, 2021

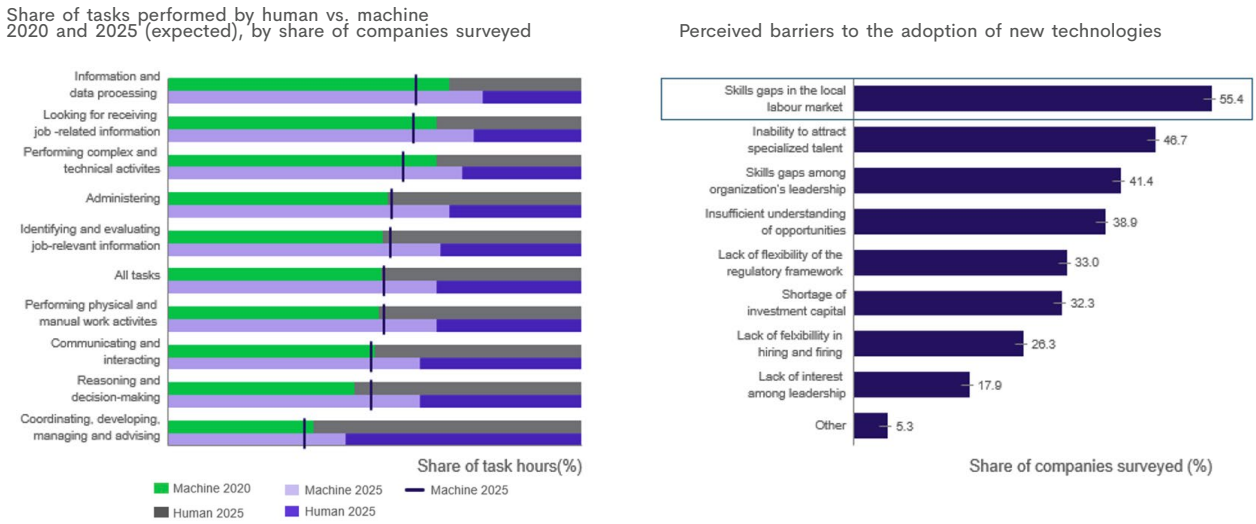
that specific MSME. For example, through a super-app's food delivery business, not only is the restaurant enabled by digitalization, but also its suppliers, merchants, packaging business, and so on.

All firms and sectors were, directly or indirectly, affected, but MSMEs were hit particularly hard by the COVID-19 pandemic[82]. Overrepresented in the most exposed sectors (e.g., food and accommodation services), they often had to close operations. Among those that were able to continue operations, many saw significant falls in revenue and faced severe liquidity shortages as a result. According to the Facebook/OECD/ World Bank Future of Business Survey, among MSMEs that remained open from May to December 2020, between 55-70% saw sales fall, with two thirds experiencing falls of more than 40%. Hence, it is important to provide the needed support during a crisis; therefore, the use of digital technologies is proving to be critical to help MSMEs during these unprecedented times. However, we note that there are still a lot of MSMEs not being digitally enabled; with the example of Indonesia, only 25% of MSMEs have used digital tools for their businesses.

We note that there are two key challenges on enabling MSMEs to go digital, first of which is ensuring that the current job requirements meet the digital skills that individuals have, and second, to enable MSMEs to secure funding for their digital expansion.

Firstly, in terms of digital automation, in tandem with the COVID-19 recession, is creating a 'double-disruption' for workers, which the majority are employed by MSMEs: first, the current shock has increased the adoption of smart working practices (involving up to 44% of the total workforce[83]), and second, automation has started to transform tasks and required skills. In such a dynamic, rapidly shifting scenario, the capability of companies and individuals to up-or re-skill becomes an utmost priority.

Exhibit 14 | Predicted rising share of automation and skills gaps in local labor market

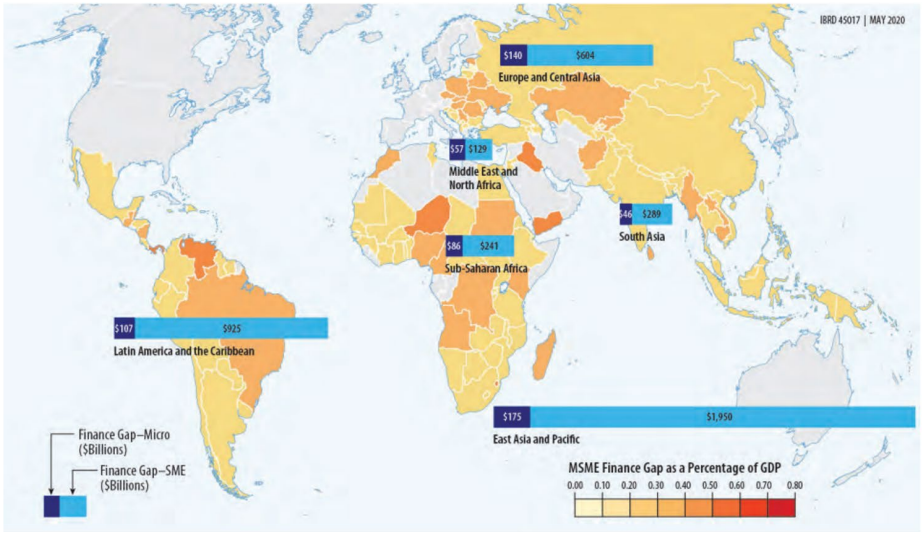


Source: Future of Jobs Survey 2020, World Economic Forum

82 OECD, SME and Entrepreneurship Outlook, 2021
83 World Economic Forum, Future of Jobs Report, 2020

The second challenge is the lack of access to finance[84], which is a critical barrier to growth for MSMEs globally and particularly in developing countries. Access to finance is a critical barrier for MSMEs to start, sustain and grow their businesses. About half of formal MSMEs do not have access to formal credit, and instead rely on internal funds, or cash from friends and family, to launch and initially run their businesses. An extensive survey of MSMEs in 135 countries showed that access to finance was reported as the most serious obstacle to the current operations of businesses. Globally, about half of formal MSMEs do not have access to credit from regulated financial institutions, as seen on the exhibit below. The current finance gap for formal MSMEs in emerging markets is estimated to be approximately USD 5 trillion, about 1.3 times the level of MSME lending. When taking informal MSMEs and MSMEs from vulnerable and underserved groups into account, there is another USD 2.7 trillion of potential demand for finance. In emerging markets, approximately 131 million, or 41%, of formal MSMEs have unmet financing needs[85]. Among the reasons are higher cost to serve MSMEs; information asymmetries, or the absence of traditional data used by banks to assess credit worthiness; lack of collateral; and onerous documentation requirements.

Exhibit 15 | Formal MSME Finance Gap in Developing Countries



Source: GPFI (Global Partnership for Financial Inclusion)

Not only for individuals and MSMEs, digital applications are also very important to smaller and rural government agencies. Digital services are the face of modern government, and great digital services can build trust with citizens[86], especially during the COVID-19 pandemic. The rapid growth of digitalization of governments, including in rural areas and certain jurisdictions, reflects its compelling advantages, such as enhanced governmental performance, lower cost structure, greater flexibility, broader scale and scope of services, greater transparency, accountability, and faster transactions. However, in developing countries and rural areas, the capacity to leverage technology for public sector transformation is uneven and typically weak[87].

84 GPFI, Promoting digital and innovative SME Financing, 2021
85 Digital Frontiers Institute, Promoting Digital and Innovative SME Financing
86 BCG. Fixing Digital Funding in Government, 2021
87 World Bank, GovTech Launch Report and Short Term Action Plan, 2020

In the effort to guide the G20 towards literacy and enabling MSME digitalization, the B20 Digitalization Task Force seeks to draw attention to four key priority actions:

- Define specific desired practical outcomes for mindsets by level of education (primary, secondary, tertiary) for individuals, while promoting the use of digital equipment and solutions, to enhance the learning experience
- Improve individuals' technical digital skills through continuous education, involving multistakeholder cooperation, to increase their propensity to use digital products and services and their ability to navigate cyberspace safely and mindfully especially for MSMEs, however applicable across all companies at large
- Accelerate responsible innovation and digital adoption especially by MSMEs, however applicable across all companies at large, by promoting policies to provide access to digital platforms that can help build competitive markets
- Increase efforts to provide sustainable and fair financing to MSMEs for accessing digital technologies

Policy Action 3.1: Define specific desired outcomes in mindset by level of education (Primary, secondary, tertiary) for individuals, while promoting the use of digital equipment and solutions to enhance learning experience

The G20 should update educational programs to include digital topics in their curricula, considering the evolving skills requirements of the public and private sector through stronger public-private coordination, while reducing gender inequalities in technology and digital education

Digital technology penetration is growing at significant speed, but the education system is often unable to keep the same pace. Digital skills, including technical capabilities such as programming, digital responsibility, and practical usage of technologies and tools, have been deemed as one of the eight critical areas when defining high-quality learning[88]. It is pivotal that G20 countries ensure that students, from kindergarten to university, have access to proper schooling and education to sustain the impact of a changing scenario. We must ensure that everyone is lettered in the new digital era, from children to adults and we must not create anxieties on using digital technologies.

The G20 should guarantee that school and university curricula are revised to meet the changing needs of the digital era, encouraging the development of fundamental ICT skills and digital competences. The G20 needs to also be mindful that these curricula should be adopted to each country's specific needs, as a nation's digital skill gap/digital challenges might differ from one another. To guarantee that educational programs are linked with business needs and future employment prospects, closer coordination between education institutions and the corporate sector should be encouraged by the G20. The call for more "digital curricula" at all levels of education should be accompanied by a focus on the importance of developing soft and cognitive skills in parallel (only people who have honed their "critical thinking" skills will be able to thrive in an economy marked by accelerating technological processes and automation, in which the digital technologies learned become obsolete very quickly).

The G20 should also support the sharing of knowledge (through international fora or global debates) on digital education to improve the diffusion and adoption of success models across different countries. At the same time, at a national level, domestic Education Ministries can play a pivotal role

88 World Economic Forum, Schools of the Future Report, 2019

in fostering technological skills. Successful initiatives where public and private actors collaborate, to increase the development of youth and professional digital skills, should be scaled-up and replicated.

Moreover, we call on the G20 to ensure global coordination aimed at establishing equal opportunities for all (e.g., women remain under-represented across the digital sectors[89]). Effective digital education action plans should eliminate inequalities by adopting policies that ensure that all genders, ethnicities, and socioeconomic statuses have equal access to skilling opportunities.

The G20 should also provide practical and alternative solutions for citizens with lower internet skills to enhance competitiveness, such as emphasizing the importance of developing relevant local content for digital education, as we note that a lot of countries, especially developing economies that are not as privileged in terms of digital enablement, do not speak English.

In addition, we also call upon the G20 to expand digital education to vocational programs as well. Vocational education may also become the "fast track" initiative to develop and upgrade digital skills and competencies.

The G20 should promote the effective usage of digital equipment and solutions, including laptops, for educational purposes to improve students' learning experience, and enhancing teachers' digital proficiency

We believe that the G20 should not only modify educational programs' curricula, but also reshape how students are educated, enhancing their ability to interact with technology. To enhance the role of technology as a crucial learning enabler, good policies and investments are required. To do this, G20 nations should not only focus on giving students access to software and devices, but also encourage teachers to receive training in digital tools and learning approaches. Government may struggle to deliver this alone, and enterprise-led initiatives, delivered in conjunction with government and civil society should be encouraged where suitable.

Digitalization and the expansion of digital skills should not be limited to tech-related subjects, but rather be used as a cross-cutting enabler to improve learning across disciplines. To do this, teachers should promote the use of electronic tools and gadgets, allowing pupils to build competence and confidence in dealing with digital tasks and instruments over time.

The G20 should support the development of basic digital skills to help youth become skilled and responsible digital citizens who are aware of digital threats and can safely browse the internet (e.g., critical thinking to recognize online misinformation, avoid cyberbullying and hate speech, understanding of Personal Identifiable Information)

Children today spend more time online and engage with the digital environment for myriad reasons through a variety of different devices[90]. These enormous prospects come with a changing risk landscape that has changed considerably in recent years. Sexting and fake news, for example, have emerged as hazards to children, while existing risks, such as cyberbullying, have evolved in scope and character.

89 World Economic Forum, Global Gender Gap Report, 2020
90 OECD, Ensuring a safe and beneficial digital environment for children, 2021

The OECD identifies four main categories of risks (contact, content, conduct, consumer) as well as three areas of cross-cutting risks (health and wellbeing; privacy; advanced technology risks)[91].

As a result, G20 nations should work closely with educational institutions at all levels to ensure that these difficulties are adequately handled. Customized programs and open courses are effective methods for sharing information and encouraging ethical and informed use of digital resources. The teaching of digital skills should be part of the school's core curriculum and should include even basic skills, such as critical thinking to avoid suspicious links, understanding of personal identifiable information, creating strong passwords, amongst others.

Note: more information on education included in Future of Work and Education Task Force's policy paper

91 OECD, Children in the digital environment, 2021

Policy Action 3.2: Improve individuals' technical digital skills through continuous education, involving multistakeholder cooperation, to increase their propension to use digital products and services and ability to navigate the cyberspace safely and mindfully, especially for MSMEs, however applicable across all companies at large

The G20 should bring more awareness towards the benefit of digitalization to companies, especially MSMEs

There are several key benefits of digital transformation for companies, to include extending the senses of the organization, creating connected digital learning loops, focus human and algorithms on their respective areas of strength, facilitate fast information transfer of ideas, facilitate cooperation, and overcome planetary and social limits[92].

Hence, we call upon the G20 to explore opportunities to create campaigns to promote the benefits of digital transformation to encourage adoption. Some of these campaigns can be specifically targeted at MSMEs.

The G20 should create programs to build stronger awareness of the risk of cyber security for private users and MSMEs (e.g., financial risks)

Internet-based crime is one of the fastest growing security threats. As internet use increases, there has also been a shift in how people use computers for transactions and communication. Personal information such as email addresses, phone numbers, names, and other login credentials are utilized by hackers to commit identity fraud.

Hence, the G20 should strengthen awareness of the potential damage that cybercrime can cause to end consumers. This would include considering the development of communication strategies and building digital platforms with content such as sharing good practices to improve private users' and MSMEs' online protection.

92 BCG, The Why of Digital, 2020

The G20 should map digital competences building on existing frameworks and promote the development of national digital skills strategies defining priorities, action plans, and required investments based on companies digital needs in the post COVID-19 era, especially for MSMEs, however applicable across all companies at large, while also promoting initiatives to collect systematic data on this topic

Firstly, to help map current levels of digital competence across countries and industries, the G20 can recommend initiatives to help in the collecting of systematic data on this topic. Europe's Digital Economy and Society Index (DESI) is a good example to follow.

The G20 countries should encourage the establishment of globally shared standards for assessing and tracking current levels of digital competence across industries and sectors, as well as a common digital skills taxonomy. Governments can also collaborate with the private sector to create a single career directory, with the goal of enhancing the detection of demand-supply imbalances in the digital labor market, particularly for small and medium-sized businesses.

We further call on the G20 to build on existing initiatives, combining regional, national, and subnational frameworks such as the World Economic Forum's (WEF) Global Taxonomy[93], the Occupational Information Network (O*NET) Taxonomy and the ESCO (European Skills, Competences and Occupations) framework.

In addition, further investments in digital skills development and innovation in the public sector are crucial to supporting the transition to a data-driven culture and building strong technical skills. We must recognize that access to digital technologies is insufficient in and of itself to translate into productivity outcomes; complementary factors such as managerial and organizational capabilities, as well as external to the firm factors, are required for these digital technologies to have an impact on a firm's productivity dynamics[94]. Hence, we urge the G20 to also invest to boost complimentary factors such as change management capacity, the ability to integrate digital systems into production processes, data management capabilities, internal stock of digital skills, and access to the knowledge of potential operational technology solutions.

The G20 should embrace policies to promote training and continuous education to enable the up/re-skilling of displaced workers and to create new job opportunities in emerging sectors, while also addressing gender and generational gaps in technology usage / proficiency

Members of the G20 should adopt national plans for the development of digital competencies, leveraging individual up- and re-skilling. Domestic and foreign skill gaps and mismatches should be addressed through strategies. Investment plans should be defined consistently across countries to avoid inconsistencies.

We also call upon the G20 to ensure that education on digital technology does not stop at school and university but is continuously given through training and workshops within companies through corporate learning and development programs. These continuous professional educations are critical and can be personalized towards specific professions, for example training on digital health ethics and

93 World Economic Forum (WEF), Building a common framework for Skills at Work: A Global Taxonomy, 2021
94 World Bank, Europe 4.0: Addressing Europe's Digital; Dilemma, 2020

confidentiality of patient details for professionals in the healthcare sector. With the example of the healthcare sector, there is a need for systematic approach to digital skilling for all categories/cadres of health workers, including doctors, medical students, nurses, midwives, and allied health workers to make them future ready. This can be done by integrating digital skilling as a core content of medical education and continuing professional development. The curricula should also focus on skills such as critical appraisal of information, using digital health tools and technologies, and communicating the ethical dimension of digital communication such privacy & confidentiality to patients.

In parallel to trainings on digital technologies, we also note the importance of training on complementary interpersonal skills and managerial skills, which are also essential for building firms' organizational capabilities.

At the same time, related Ministries can play a critical role in cultivating technology capabilities at the national level, such as encouraging training programs for employees.

Other than continuous corporate education provided by companies, the G20 can also encourage companies to launch on-the-job trainings and peer-to-peer learning as one of the methods to accelerate digital upskilling/re-skilling.

It is also important to have a targeted intervention in the education of the very established professions around the world, such as, law, accounting, or medicine, because often the professions can be the gatekeepers for choices made by citizens of countries and societies around the world. Ironically, those professions can be the ones which struggle most to stay up to date with the latest technology and innovation opportunities.

The G20 should encourage the development of open-source platforms, digital use case libraries, digital knowledge platforms, and open access to data. The G20 should also consider the appointment of an international working group responsible for creating a comprehensive and accessible digital use case library, while also increasing the awareness of availability of these use cases to MSMEs

Even though digital transformation is viewed as a priority for economic and industrial development, many businesses, particularly small and medium businesses, are unaware of the potential use cases and benefits of technology deployment. The G20 should encourage companies and industries to contribute use cases by offering collaborative online platforms and fora where they may discuss their digital transformation experiences and best practices.

We encourage the G20 to build on previous efforts.

For example, the Industrial Internet Consortium Use Case Repository[95]: offers a resource for industrial internet applications, enabling visitors to search and find use cases pertinent to their own activities and direction and use the knowledge gained from the use cases as references in their own IoT implementations. Another example is the B20 use case library made by the digitalization task force, which was established by the B20 Italy team and further improved by the B20 Indonesia team

95 Industrial Internet Consortium, Use Cases

with the addition of more use cases. A use case is a description of a generic, reusable practice or procedure, usually described in the form of a scenario that represents typical business operations, related or unrelated to a specific industry sector.

The G20 should facilitate MSMEs digital advancements by conducting specific training programs, exploiting competence centers and innovation advisory hubs

It is essential for the G20 to have a clear baseline on MSME current competencies, and to create training programs catering to the learning path of different MSMEs types and scales. We understand that MSMEs adaption to technology comes through different stages – with one categorization using the example of Technology Adoption Curve (innovators, early adopters, early majority, late majority, and laggards). By creating an initial baseline, we can develop a systematic upskilling program for MSMEs with measurable outcomes. After understanding the baseline, we can do training programs to fill the skills gap, which can be done through promoting colleges and business collaboration. As an example, MSMEs may provide internships for students.

In addition, countries should also provide digital technology advising and consultancy services for businesses, particularly MSMEs. The G20 should boost public-private collaboration in this framework, leveraging existing competence centers and innovation hubs. The Singaporean "SMEs Go Digital program" provides a realistic example by providing supporting tools to aid MSMEs' digital transformation, including a wide range of initiatives to fulfill digitalization demands at various stages of growth and maturity. The Singapore government also launched the Chief Technology Officer-as-a-Service project, which allows MSMEs to tap into a pool of competent digital consultants quickly.

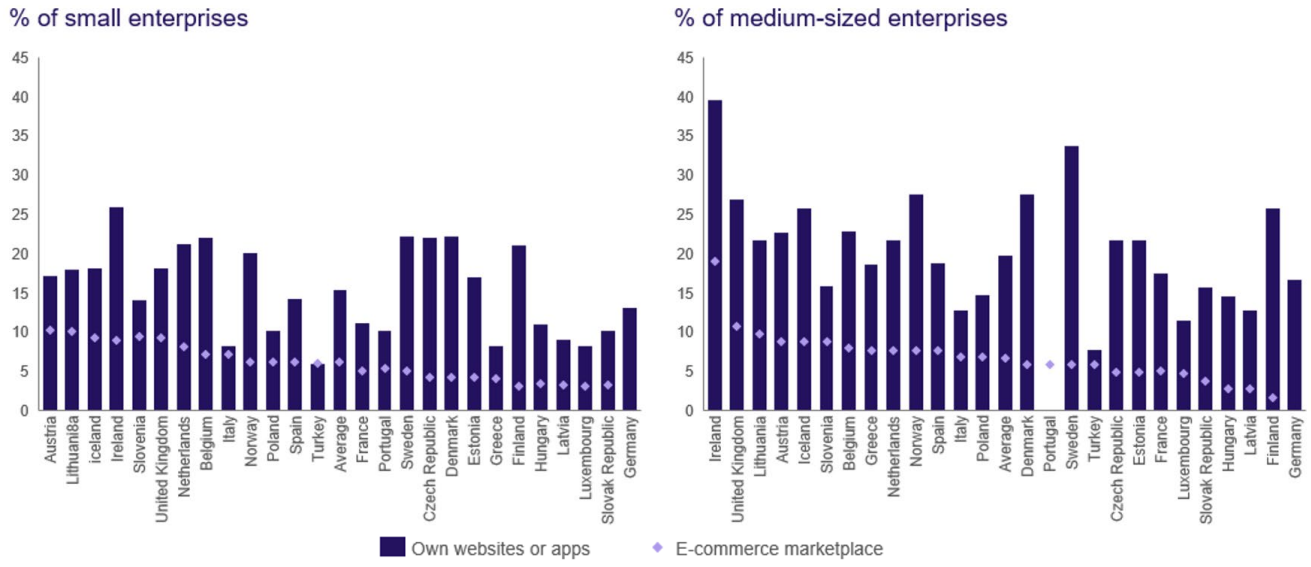
The G20 should promote the issue of mutual recognition of documents confirming the acquisition of education, skills, and competencies in remote formats using digital technologies

COVID-19 underlined the importance of having a labor force with high professional skills for the digital era. That means, on the one hand, employees should be able to use various digital tools to fulfill their work and stay competitive under the new labor market conditions. On the other hand, the employees should have an opportunity to update their skills and knowledge to obtain a new profession. This, in its turn, enhances the relevance of international recognition of the documents confirming such requalification and vocational training.

Policy Action 3.3: Accelerate responsible innovation and digital adoption especially by MSMEs, however applicable across all companies at large by promoting policies to provide access to digital platforms that can help build competitive markets

Online platforms are central in the development of digital economies and societies. In the last decade, they have been impacting economic sectors and social dynamics in OECD countries and beyond[96]. Online platforms can be pure intermediaries, direct service providers, employers, lenders, or, indeed, a combination of them all. Greater uptake of online platforms is especially important for MSMEs. One key element for MSMEs in both developed and developing economies is that online marketplaces enable them to trade internationally and provide a wide range of complementary services (e.g., logistics, data analytics); almost half of MSMEs selling through e-commerce sell abroad[97].

Exhibit 16 | Percentage of firms using e-commerce, by firm size, 2019



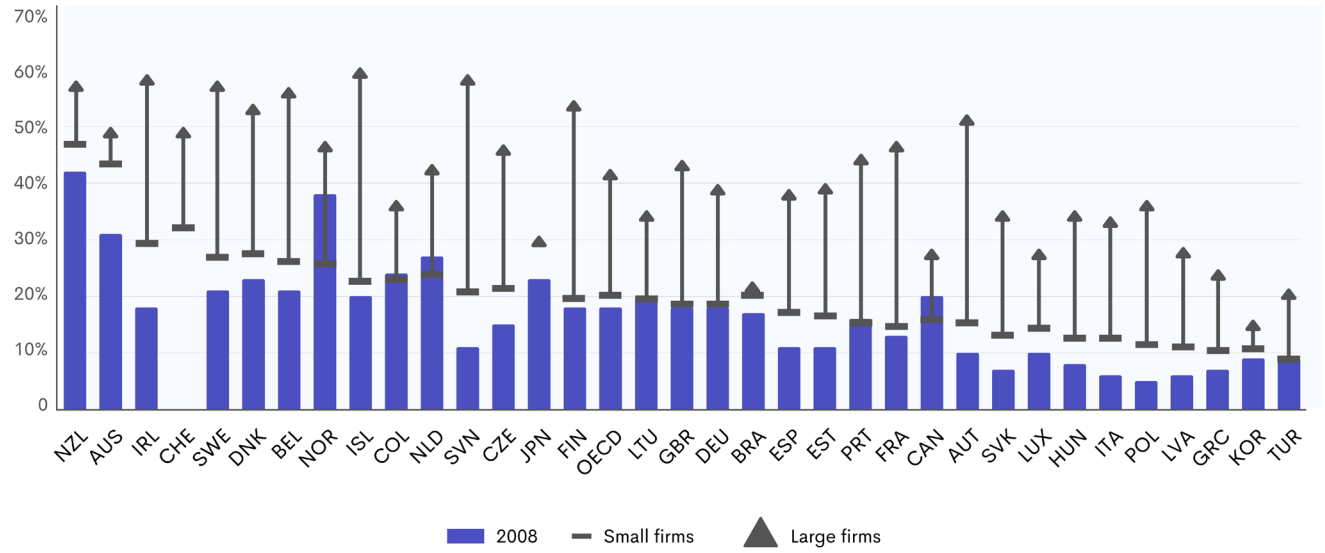
Source: OECD, SMEs in the online platform economy, based on Eurostat data, 2020

96 OECD-iLibrary, 3. SMEs in the online platform economy | The Digital Transformation of SMEs | OECD iLibrary
97 OECD/WTO (2017), Aid for Trade at a Glance 2017: Promoting Trade, Inclusiveness and Connectivity for Sustainable Development, World Trade Organization, Geneva/OECD Publishing, Paris, Aid for Trade at a Glance, 2017

However, OECD data shows that, while business participation in e-commerce has increased since 2008 across all firm sizes, smaller firms are lagging behind large firms. Unlike their larger counterparts, MSMEs lack the ability to develop internal digital infrastructures because of limited financial resources and/or skills[98].

Exhibit 17 | Businesses receiving orders over computer networks

Business receiving orders over computer networks, as a percentage of all enterprises with ten or more persons employed, by firm size, 2017



Source: OECD, Unpacking E-commerce: Business Models, Trends and Policies, 2019

A survey conducted in October 2020 by the Visa Economic Empowerment Institute (VEEI) in Brazil, Colombia, Malaysia, the Philippines, and South Africa found that MSMEs that leveraged digital services (such as accepting remote orders or leveraging online marketplaces) were able to mitigate the impact of the crisis. The study also found that a significant percentage of MSMEs have heavily adopted digital and mobile payments, QR Code capabilities, and other payment services during the pandemic, while also expanding their use of social networks and marketplaces. Businesses that adopted these tools reported doing better, and they were more optimistic for the future[99].

The COVID-19 crisis has heightened the importance of MSME digitalization and served as an accelerator of trends. Data gathered in a joint research initiative by the OECD, Facebook and the World Bank (Future of Business Survey) showed that between 25% and 62% of SMEs (with a Facebook page) across OECD countries increased the digitalization of their business processes in 2020. For many SMEs, digital technologies have been essential to the continuation of economic activity and the provision of essential services during the crisis[100].

Other than giving MSMEs and other companies access to online platforms, it's vital to note that having access to digital technology does not guarantee their dissemination or effective application if other elements aren't in place. Analog logistics, last-mile delivery issues for e-commerce, e-government,

98 OECD (2019), OECD SME and Entrepreneurship Outlook 2019, OECD Publishing, Paris, OECD SME and Entrepreneurship Outlook, 2019
99 Visa, Small Business in the Digital Age: Recommendations for Recovery and Resilience, 2021
100 OECD iLibrary, SME Digitalisation to "Build Back Better", 2021

e-signatures, virtual delivery of professional services, and others are instances of complementing factors. One example that the G20 can urge MSMEs to adopt are digital payment systems based on QR, such as QRIS in Indonesia. These systems can help MSMEs foster inclusiveness by allowing users of any e-Wallet service to make payments to merchants, including cross-border transactions.

Relevant stakeholders here do not only include MSMEs, but also smaller government entities, such as government offices in rural areas, to also help bridge the digital divide between urban and rural governments.

The G20 should promote policies to provide access to digital platforms that can help build open and competitive markets, where partnerships are encouraged, to accelerate responsible innovation[101]

The G20 should promote regulations that can help build competitive markets, emphasizing the potential for MSMEs to partner with external parties, to accelerate growth and innovation responsibly. Responsible innovation relates to making technology work for society without causing more problems than they're trying to solve.

First, policies should support robust, safe, efficient, accessible, and affordable digital payment systems which create incentives for merchants and MSMEs to accept and for consumers to use.

Second, policies should also create conditions that encourage bank-fintech partnerships that may lower costs, strengthen financial inclusion and/or improve the quality of financial products and services for MSMEs.

Third, policies should promote a level playing field to ensure the benefits of e-commerce and the sharing economy result in inclusive growth for MSMEs, such as by supporting cross-border e-commerce sales. For example, in some countries, governments are promoting programs in co-operation with some of the largest online platforms (specifically e-commerce and advertising platforms), helping SME internationalization, awareness of digital solutions, national brand recognition, and ultimately SME resilience[102]. All related policies need to promote the participation of MSMEs on digital platforms, while balancing fair requirements which do not lead to the reduction of MSME income. While digital platforms offer important services to MSMEs, the possibility of MSMEs to preserve independent strategies and innovate by themselves are also important to maximize the benefits of digital transformation for all and to ensure inclusive transition for MSMEs to the digital economy.

Another possibility, to encourage partnerships and innovation, is the implementation of regulatory sandbox efforts. Regulatory sandboxes are a policy tool that can be used to promote the use of digital tools and increase public access to them. Regulatory sandboxes are characterized as a "framework that allows innovators to perform small-scale short-term testing of their inventions with live participants in a regulated, restricted, secured environment under relaxed regulatory circumstances, under the supervision of a regulator." As developed and developing countries begin to experiment with these frameworks, more have recently surfaced allowing innovators to test new technology.

101 GPFI, Promoting digital and innovative SME Financing, 2021
102 OECD iLibrary, 3. SMEs in the online platform economy | The Digital Transformation of SMEs

Regulatory sandboxes provide an innovation-friendly signal to the market, the potential for a more seamless path to innovation deployment, the emphasis of policy objectives and the potential for financial inclusion benefits, the potential to improve regulatory capacity and innovator knowledge, and the reduction of regulatory uncertainty. Finally, partnerships with the private sector on MSME digitalization should be encouraged, leveraging exchanges of knowledge, digital tools, and capabilities.

One example would be South Korea's initiative on launching Virtual Sandbox for fintech development. In 2021, the South Korean Financial Services Commission (FSC) revealed intentions to build a digital sandbox to test new fintech goods and services being developed. The move is part of a larger plan to expand the region's fintech business. Fintech service providers will be able to test their new products on the market using a digital sandbox, while users will be able to discover new services[103].

103 Fintech Magazine, South Korea launches Virtual Sandbox for fintech development, 2021

Policy Action 3.4: Increase efforts to provide sustainable and fair financing for MSMEs to adopt digital technologies

Governments should ensure the momentum for MSME adoption of digital technologies is not lost as economies strive for a long-term sustainable recovery. An OECD analysis of more than 90 rescue and recovery packages worldwide shows that targeted support to SME digitalization increased in absolute value but decreased as a share of total investment in digitalization, from around 23% (USD 8 billion) in rescue packages (i.e., immediate response to the crisis), to 8% (USD 49 billion) in recovery packages (i.e., medium-long term recovery plans)[104].

The G20 members should ensure that recovery packages include long-term support for MSME digitalization. Moreover, the G20 should increase efforts on MSME sustainable and fair financing mechanisms to boost digital capabilities and develop a strong digital infrastructure base, by increasing awareness on the opportunities available for firms in terms of financing support, and applying new digital solutions to close the MSME financing gap

The G20 should strengthen awareness of the opportunities available to firms in terms of investment support, funds, and grants, particularly in developing countries. This would include considering the development of communication strategies and building digital platforms clearly aimed at specifying channels, eligibility criteria, awarding process, and requirements for companies to access specific subsidies or support.

Another idea the G20 can try is to create awareness of new digital solutions to close the MSME financing gap. The application of different technology innovations, digital financial services (DFS), or the provision of financial products and services through digital channels, has become an essential enabler to close the MSME financing gap. Technology innovations serve as the foundation for the development of new business models and digital financial products, which include digital loans and other credit products, as well as equity capital.

104 OECD iLibrary, SME Digitalisation to "Build Back Better", 2021

RECOMMENDATION 4

Promote risk and evidence based interoperable and technology-neutral cybersecurity standards and best practices that support companies' efforts to protect their networks:

Define cybersecurity protocols, promoting enhancement of cybersecurity practice and education to private users and companies including MSMEs

POLICY ACTIONS

Policy Action 4.1 – Define cybersecurity and cyber resilience interoperable standards and best practice using a risk and evidence-based, and technology-neutral approach to all levels of supply chain

Policy Action 4.2 – Promote enhancement of cybersecurity practice through increasing awareness of security threats, bridging cybersecurity skill gaps, requiring government vendors to meet self-regulating cybersecurity standards, increasing cross-border cooperation and championing the implementation of universally recognized norms, rules and principles

LEADING MONITORING KPI	OWNER: G20 COUNTRIES	
% of Countries with Data Protection and Privacy Legislation *Source: United Nations Conference on Trade and Development (UNCTAD)*	**Baseline** **66%** *(2020)*	**Target** **100%** *(2024)*

SDG IMPACT

Recommendation 4 contributes to the achievement of UN's SDG for the goals: 8: Decent Work and Economic Growth, 9: Industry Innovation and Infrastructure, 16: Peace Justice and Strong Institution

Policy Action 4.1 – By encouraging risk-based approach to all level of supply chain, the policy action impact target **16.6** *(Develop effective, accountable and transparent institutions at all levels).*

Furthermore, granting more resilient infrastructures (**target 8.2** - *Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labor-intensive sectors*), while at the same time ensuring industries' sustainable growth (target **9.1** - *Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all*)

Policy Action 4.2 – Enhancing cybersecurity resiliency through skill building will impact target **16a** (*Strengthen relevant national institutions, including through international cooperation, for building capacity at all levels, in particular in developing countries, to prevent violence and combat terrorism and crime*).

Ensuring cross-border cooperation on cybersecurity among nations, supports target **16.3** (*Promote the rule of law at the national and international levels and ensure equal access to justice for all*).

G20 INDONESIA PRIORITY IMPACT

By focusing on the issue of cybersecurity for individuals, organizations, and governments, especially Critical Infrastructure (CI) and (CNI) Critical National Infrastructure, **Recommendation 4** commits towards the achievement of Global Health Architecture, Digital Transformation, and Sustainable Energy Transition key priorities of the G20 Indonesia presidency.

Policy Action 4.1 on defining cybersecurity and cyber resilience interoperable standards that are risk and evidence-based and according to best practices to all level of supply chain is applicable to all industries and sectors, including the issue of healthcare and critical infrastructure would contribute to all key priorities of Global Health Architecture, Digital Transformation, and Sustainable Energy Transition.

Policy Action 4.2 on promoting awareness of cybersecurity threats, bridging cybersecurity skill gaps, and requiring government vendors to meet self-regulating cybersecurity standards will directly impact the key priority of Digital Transformation.

CONTEXT

Cyber-related attacks have grown to become more imminent today[105]. The significant growth in the frequency and severity of such incidents has resulted in severe damage to the global economy. Cyberattacks are a risk for everyone; a disruption in essential government services such as financial systems, healthcare, energy, water supply, and more can and will compromise national security and personal data. Additionally, in the wrong hands, targeted attacks may also cause loss of life.

Cyber-related attacks have become increasingly common; in a survey by Accenture, there were an average of 270 attacks per company over the year, a 31% increase over 2020. Third-party risk continues to dominate, as seen by successful breaches to the organization through the supply chain which have increased from 44% to 61%[106].

One of the greatest cybersecurity concerns are attacks on "critical infrastructure" (CI), or critical national infrastructure (CNI), that have a great impact on society, which includes both public and private entities, large and small. Examples for attacks on Critical Infrastructure include the below:

- Healthcare: Attacks on healthcare companies, have an indirect impact on society. Based on a survey[107], in the first 6 months of 2021, 48% of hospital executives reported either a forced or proactive shutdown in the previous 6 months because of external attacks or queries. CNN also reported a 47% rise in attacks on hospitals and health care networks in the EU during the same period, as criminal networks sought to cash in on the pandemic's most vital services.

- Oil and Gas: Attacks on Oil and Gas can indirectly impact the gas supply for a certain area. A ransomware attack on the Colonial Gas Pipeline in May 2021, for example, affected filling supplies on the US East Coast for over a week, leaving many gas stations empty[108].

Cybercrime costs include forged invoices, ransoms, class-action lawsuit payouts, and share price impact. The costs of cybersecurity were expected to reach USD 2 trillion in 2021, up from USD 400 billion in 2015[109]. Not only causing financial costs, cyberattacks may lead to loss of trust between citizens and their government and could hinder meaningful progress in digital transformation, and economic development effort. Forms such as denial-of-service attacks, data breaches, and phishing attacks all threaten individuals, businesses, and governments and hit countries with ill preparation in terms of policy, regulation, institutions, and skills much harder.

With recent developments, there are several tools that can be used by stakeholders to enhance cybersecurity, including blockchain. Blockchain has evolved into one of the most failsafe systems of dealing in the digital network space, despite not being perfect. The technology has been praised for its ability to ensure information integrity when used as intended. Many industries can gain from it if

105 World Bank, Cybersecurity risks are global, 2021
106 Accenture, State of cybersecurity report, 2021
107 Perspectives in Healthcare Security, CyberMDX and Philips, 2021
108 US Government Accountability Office, 2021
109 BCG, The CEO's guide to cybersecurity, 2021

it is properly implemented. Blockchain can be used in a variety of ways because it has the potential to be useful in a variety of situations. One of the ideal applications would be to employ its integrity assurance in the development of cybersecurity solutions for a variety of different technologies[110]. Looking forward, we also note that we need to be prepared for the quantum future. Quantum computing may be widespread in 10 years, leading to an overhaul of cyber standards[111]. Quantum computers use more powerful qubits, enabling exponentially greater computational speed. While there will be advances, some encryption standards will be vulnerable to this, leading to a new race between attackers and the vulnerable. Even if action is not required immediately, countries can start to think ahead.

With the objective of providing tangible, impactful, and pragmatic actions, we urge the G20 to act along three main policy actions:

- Define cybersecurity and cyber resilience interoperable standards based on international best practices using a risk-based, evidence-based and technology-neutral approach to all levels of supply chain

- Promote enhancement of cybersecurity practice through increasing awareness of security threats, bridging cybersecurity skill gaps, requiring government vendors to meet self-regulating cybersecurity standards, and championing the implementation of universally recognized norms, rules and principles

- Education on data security standards to improve fundamental awareness of cybersecurity risks for all types of end users

110 Cyber Management Alliance, The Future Use Cases of Blockchain for Cybersecurity, 2020
111 BCG, The CEO's guide to cybersecurity, 2021

Policy Action 4.1: Define cybersecurity and cyber resilience interoperable standards and best practice using a risk and evidence-based, technology-neutral approach to all levels of supply chain

The G20 members should uplift the baseline cybersecurity posture of organizations to focus ***on promoting risk and evidence-based and technology-neutral approaches based on globally interoperable standards and best practices for all levels of the supply chain, in both developed and developing economies***

We urge the G20 to uplift the baseline cybersecurity posture of organizations, to focus on the value-added in promoting risk-based, interoperable standards based on international best practices in all countries, not only developed markets, as we understand that there are a lot of developing economies which don't have any cybersecurity standards. We urge the G20 to ensure implementation of these cybersecurity standards across all economies. As an example, we understand that the US has the NIST framework and standards, which some other countries are adopting as well. A more open, interoperable, and harmonized cyber ecosystem could aid organizations in developing more effective and long-term cyber defense strategies. Promoting interoperability and widespread use of harmonized standards, protocols, and taxonomies can help organizations to identify, block, and respond to cybersecurity attacks with speed.

One strong example of promoting interoperability between regulatory standards is the Financial Services Cybersecurity Profile ("the Profile"), which has been endorsed by leading regulatory bodies (NIST, ENISA, FFIEC, OICV-IOSCO) and adopted by some of the world's largest financial institutions. The Profile offers a single framework that maps together dozens of different cybersecurity standards and regulations from different regulators and countries. In a world where some financial institutions spend more than 50% of their security budget on compliance, the Profile dramatically simplifies compliance and allows institutions and regulators to focus their efforts on the areas of greatest need. The Profile also embodies the idea of risk or impact tiering, which means that security requirements increase as institutions become larger and more critical to the economy: the Profile includes a tool to measure an institution's significance to the overall economy and then dictates 4 tiers of requirements, depending on which impact tier an institution falls under.

Practical cybersecurity policies are flexible, technology-neutral, and are more effective when they take a risk-based approach that emphasizes effective outcomes instead of rigid controls. The tools and methods used to achieve the outcomes vary because each organization's risks, priorities, and systems are unique. Policies that recognize this provide organizations with the flexibility to choose the most appropriate approach to protect what is most important to their business and avoid shifting resources away from securing assets to reporting and compliance requirements.

We note that these standards should be provided not only to networks but to the entire digital infrastructure of the supply chain. Cybersecurity is a shared responsibility; supply chains are a multilayer structure and if one of those layers has a low cybersecurity level it becomes the point of entry into the whole value chain.

Policy Action 4.2: Promote enhancement of cybersecurity practice through increasing awareness of security threats, bridging cybersecurity skill gaps, requiring government vendors to meet self-regulating cybersecurity standards, increasing cross-border cooperation and championing the implementation of universally recognized norms, rules and principles

The G20 members should increase the awareness of security threats amongst businesses, bridge cybersecurity skill gaps, and require government vendors to meet self-regulating cybersecurity standards

There are several initiatives that the G20 members can do to promote cybersecurity. G20 members should increase awareness of security threats amongst businesses, especially MSMEs as they are typically less well equipped than larger firms with the institutional, managerial, and financial capacity needed to develop and implement appropriate digital risk management practices. This is also the first recommendation from the OECD Security Guidelines for Digital Security Risk Management for Economic and Social Prosperity[112]. For example, national cybersecurity agencies (NCAs) can also enhance companies understanding on cybersecurity issues and prevention methods with dedicated programs, with the Singaporean SG Cyber Safe Program as an example. We also note that increasing IT security spending will not be enough to face cyberthreats as businesses require more cybersecurity professionals: The world is lacking 3 million cybersecurity professionals[113]. Hence, the G20 members can explore opportunities to promote forums with education entities, directly fund high-school and university programs, assess the establishment of certification for cybersecurity professionals, partner with tech companies to run education programs, and directly train government workers to help bridge the skills gap. The G20 members can also require government vendors to meet self-regulating cybersecurity standards, using risk-based, and a technology-neutral approach. Self-regulating here means industry-set standards, for example the cloud Security Alliance's "Cloud Controls Matrix (CCM)," Healthcare Supply Chain Association's "Recommendations for Medical Device Cybersecurity Terms and Conditions," and the Cybersecurity Tech Accord's statement on consumer device security requirements. Given the multi-national nature of most large companies and the challenge for regulations to stay up to date in the fast-moving cyber world, governments

112 OECD, Digital Security Risk Management for Economic and Social Prosperity, 2015
113 Mint, Shortage of cybersecurity professionals a key worry for firms in 2022, 2022

should endorse, support, and align with industry initiatives like these.

The G20 should enable cross border cooperation to prevent cybersecurity threats through promoting coordinated multilateral and multi-stakeholder discussions, leveraging global forums, and working groups on cybersecurity-related topics to ensure the establishment of national cybersecurity agencies with clear agendas and effective governance mechanisms

To define common guidelines and procedures to regulate the cyber domain in a manner commensurate with its underlying risks, G20 countries should promote existing treaties and foster dialogue across governments, institutions, working groups, industries, and firms. We believe that multi-stakeholder cooperation stands out as a crucial success factor in this area, as it enables learning from other countries' results and challenges and allows replicated policies that have already proven to be effective elsewhere. For this reason, the G20 could leverage on other cross-country, multi-stakeholder dialogues that have already been launched, such as the OECD "Global Forum on Digital Security for Prosperity" and Global Forum for Cyber Expertise (GFCE).

In this context, we further stress the need for national cybersecurity agencies (NCAs) to align at the international level, to ensure their action plans are coherent with each other. Agencies should oversee the nation-wide cybersecurity strategy agenda, covering every aspect including training, standards, prevention, detection, and response. Specifically, these strategies can also consider classifying entities into systemically against or not systemically important digital entities, incorporating classification criteria such as number of customers, participation in % of Gross Domestic Product, or criticality/sensitivity of service provided, amongst others.

Furthermore, to ensure prompt coordination and faster responses to cyberattacks, the G20 should consider more effective data sharing both within regional organizations and at the international level during these discussions.

In addition, G20 members can encourage greater resiliency by establishing a process and platform where organizations report cyberattacks to the government to receive the appropriate support.

The G20 should champion the implementation of universally recognized norms, rules, and principles of responsible state behavior in cyberspace and lead by example in implementing rules and principles

The G20 should continuously champion the implementation of universally recognized norms, rules, and principles of responsible state behavior in cyberspace as adopted by consensus in the March 2021 UN General Assembly First Committee[114] to promote cybersecurity and reduce cyber risk for all stakeholders. UN's Member States agreed that the existing acquis for responsible state behavior in cyberspace fully applies. They also endorsed recognition of further obligations for countries to promote international peace and security in the online environment.

The G20 should lead by example and commit to fully implementing rules and principles resulting in responsible state behavior and periodically review progress to ensure implementation of the norms mentioned above, we also are calling on non-G20 countries to do the same.

114 Foley Hoag, United Nations Working Group Approves Cybersecurity Report: what is it and what are the Implications?, 2021

ANNEX

ACRONYMS

AI	Artificial Intelligence
B2B	Business to Business
B2C	Business to Consumer
B20	Business 20
CAGR	Compounded Annual Growth Rate
CYBSI	Cybersecurity Initiative
DDoS	Distributed Denial of Service
ESCO	European Skills, Competences, and occupation
ETSI	European Telecommunications Standards
EU	European Union
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GHG	Greenhouse gases
G20	Group of 20
HW	Hardware
ICT	Information Communication Technology
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IoT	Internet of Things
I4.0	Industry 4.0
IP	Intellectual Property
ISO	International Organization for Standardization
ITU	International Telecommunication Union
JSI	Joint Statement Initiative
MBPS	Megabit-per-second
MSMEs	Micro, Small, Medium Enterprises
M2M	Machine-to-Machine
NBPs	National Broadband Plans
NCA	National Cybersecurity Agencies
NIST	National Institute of Standards and Technology
NTUC	National Trades Union Congress
OECD	Organization for Economic Co-operation and Development
O*NET	Occupational Information Network
OPC	Open Platform Communication
R&D	Research & Development
SDGs	Sustainable Development Goals
SMEs	Small-Medium Enterprises

SOC	Social Overhead Capital
STIP	Science, Technology, and Innovation Policy Compass
SW	Software
TBT	Technical Barrier to Trade
TeSA	Singaporean Tech Skills Accelerator
TF	Task Force
UBB	Ultra Broad Band
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar
USFs	Universal Service Funds
WEF	World Economic Forum
3GPP	3rd Generation Partnership Project

Schedule of Task Force Exchanges

#	Date	Event	Location	Theme
1	14/02/2022	Taskforce Call 1	Remote	Digitalization Policy Paper
2	21/03/2022	Taskforce Call 2	Remote	Digitalization Policy Paper
3	18/04/2022	Taskforce Call 3	Remote	Digitalization Policy Paper
4	19/05/2022	Taskforce Call 4	Remote	Digitalization Policy Paper
5	27/06/2022	Taskforce Call 5	Remote	Digitalization Policy Paper

Distribution of Members

Country	#	Country	#	Country	#
Indonesia	37	Canada	3	Brazil	1
United States	17	Turkey	2	Romania	1
China	13	Philippines	2	Hong Kong	1
Russia	7	South Africa	2	Taiwan	1
France	6	India	2	Australia	1
Italy	5	Argentina	2	United Arab Emirates	1
Saudi Arabia	4	Japan	2	Austria	1
Spain	3	Switzerland	1	Belgium	1
Singapore	3	Mexico	1	South Korea	1
United Kingdom	3	Finland	1	Egypt	1
Germany	3				
Total: 129					

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Stanislav Pozharnov	Russian Direct Investment Fund	Russia	Valeriya Zadorozhnaya
Evgeny Melnikov	Russian Union of Industrialists and Entrepreneurs (RSPP)	Russia	Tatiana Tokareva
Pipin Moh Saeful Arifin	Santosha Tekno Utama	Indonesia	Pipin Moh Saeful Arifin

Andrey Neznamov	Sberbank of Russia	Russia	Alexandra Krivosheeva
Deddy Machdan	Shipper Indonesia	Indonesia	Alex Chandra
Ignesjz Kemalawarta	Sinar Mas Land	Indonesia	Balqis Afifah
Devin Narang	Sindicatum Renewable	United Kingdom	Kajal Singh
Viktor Vekselberg	Skolkovo Institute of Science and Technology (SkolTech)	Russia	Evgeny Melnikov
Bahar AlHarbi	Startups House	Saudi Arabia	Bader Altheibany
Julian David	techUK	Romania	Sabina Maria Ciofu
Agustín Sáenz	Tecnalia	Spain	Fernando Quero
Komang Aryasa	Telkom Indonesia	Indonesia	N/A
Sarp Kalkan	The Union of Chambers and Commodity Exchanges of Turkey	Turkey	İrfan Demirören
Barbara Wanner	U.S. Council for International Business	United States	Erin Breitenbucher
Lixin (Larry) Wang	UnionPay International Co., Led	China	Liying Pan
Landry Subianto	US ASEAN Business Council	Indonesia	Angga Antagia
Landry Subianto	US-ASEAN Business Council	Indonesia	Angga Antagia
Darhl Vercaigne	VCMx Exchange Inc	Canada	Arlene Janzen
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George Salis	Vertex, Inc.	United States	N/A
Niki Luhur	VIDA	Indonesia	Sati Rasuanto
Jeffrey Owens	Vienna University of Economics and Business	Austria	N/A
Elvera Makki	VMCS Advisory Indonesia	Indonesia	Ananta Wisesa
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Moses Lo	Xendit	Indonesia	Mikiko Steven
Xiang Wang	Xiaomi Group	China	Zhen Liu
Kursad Keteci	Yapi Kredi Bank - Koc Holding	Turkey	Bahar Dırbali Kok
Sam Han	Yizheng Haifeng Industry & Trade Co., Ltd.	China	N/A

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