B20 ITALY

Digital Transformation

Policy Paper 2021

B20
ITALY
2021

RESHAPE
THE FUTURE:
INCLUDE,
SHARE, ACT

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Foreword by the Taskforce Chair

Task Force Chair – Digital Transformation

We named our task Force "Digital Transformation" as we truly believe we are in for a new challenge, which is to re-imagine the way we design, think, and shape our lives, economies, and work.

Technology is here to offer us an incredible opportunity: finding new solutions to old problems, giving new answers to old questions. Technology is enhancing our hardware, our platforms, our networks, and our infrastructures, but the operating system remains our culture. That is why we are here, to facilitate operating in a very innovative and creative environment.

Digital Transformation is increasingly becoming a global engine of sustainable economic growth, with over 60% of GDP expected to depend on digital technologies by 2022 . To enable this growth, connectivity must be considered an essential service for all.

Digital population is on the rise, growing connection quality and outreach are unlocking more valuable use cases, and new trends such as Big Data, Artificial Intelligence, Internet of Things and Industry 4.0 are boosting business effectiveness and efficiency.

Nevertheless, the full potential of Digital Transformation is yet to be realized: (i) scattered infrastructure quality still leaves many people unconnected, (ii), lack of trust in the overall digital ecosystem is adversely impacting the adoption of digital technologies, (iii) companies' interest towards investments and deployment of new digital technologies is not always at par, and (iv) significant gaps in the level of digital literacy in both individuals and companies hinder the adoption of innovative solutions.

The COVID-19 pandemic has also thrown a spotlight on the role of Digital Transformation for sustainable and inclusive economic development. Network capacity, coverage, and security have grown in importance. Individuals, both as customers and citizens, with no or limited access to digital technologies are left behind. Data consumption has risen exponentially exerting pressure on networks, with stability and cybersecurity becoming top-of-mind priorities.

The commitment of the B20 Italy is to unleash the full potential of the Digital Transformation, also as a driver for recovery, with a rigorous, tangible, and actionable plan acting on three vectors:
• Consolidating digital and technological foundations: ensuring increased network capacity and reach, improving world-wide connection quality, and promoting a fair competition throughout the digital value chain;
• Enhancing the offering: facilitating the development of new products and services from private and public sector for all stakeholders of the digital economy;
• Stimulating the demand: fostering the request for digital products and services from both customers and companies by addressing digital skills gaps and lack of awareness on their benefits.

Sincerely,
Maximo Ibarra
Chair of the 2021 B20 Digital Transformation Task Force

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[1] *World Economic Forum, Our Shared Digital Future: Responsible Digital Transformation - Board Briefing, 2019*

Task Force Composition

Why Digital Transformation Matters

Amrote Abdella
Co-Chair
Regional Director,
Microsoft 4Afrika

"Digital Transformation has never been more critical than today, in our post Covid-19 reality, where the power of technology gap is widening between developed and developing countries. As the B20, it is our duty to ensure that accessibility to all, inclusive of all countries is brought to the forefront of our business communities. Collectively, we can build a tomorrow that we can all be a part of"

Dan Bryant
Co-Chair
SVP Global Public Policy,
Walmart

"Faced with a pandemic that caused unprecedented disruption, this Policy Paper charts a path towards an inclusive recovery through Digital Transformation. Success will require a cross-sectoral commitment to blend digital tools into our economy and create on-ramps for the digitally excluded. These recommendations are the first step"

Hans-Paul Buerkner
Co-Chair
Global Chair, Boston
Consulting Group

"Digital Transformation will create a more sustainable world by supporting economic growth, while limiting emissions and resource exploitation, and promoting inclusion. Unleashing the potential of digital technologies should be at the core of companies' business strategies and at the top of public agendas"

Why Digital Transformation Matters

Börje Ekholm
Co-Chair
CEO, Ericsson

"Digital infrastructure, innovation and inclusion need to be delivered at scale with high-performance, security and energy efficiency. For governments, this means catalyzing investments, such as 5G, facilitating open innovation with markets deciding the best technologies, and digital opportunities made equal to all"

Klaus Rosenfeld
Co-Chair
CEO, Schaeffler Group

"Digitalization and sustainability are two sides of the same coin. They serve a common goal: to guarantee better opportunities to all inhabitants of our planet and to the generations to come. It's up to us to shape the digital transformation in our respective areas of responsibility, and to take timely action in the interest of everyone."

Diane Wang
Co-Chair
Founder, Chairperson & CEO, DHgate.com

"Accelerating e-commerce development and digital inclusion, women and MSMEs, in particular, can be empowered to participate in international trade. Digital Transformation creates a more fair, diverse, and inclusive society with more opportunities, and in return, it further releases the potential of digitalization to boost global economic recovery"

Task Force Coordination Group

Valentina Carlini
Task Force Manager
Confindustria

Knowledge Partner

BCG

Scientific Partners

POLITECNICO
MILANO 1863

Università degli Studi
di Napoli Federico II

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MILANO

Network Partners

Business at OECD

ICC INTERNATIONAL
CHAMBER
OF COMMERCE
The world business organization

WORLD
ECONOMIC
FORUM

COMMITTED TO
IMPROVING THE STATE
OF THE WORLD

Recommendations: Executive Summary

Recommendation 1 – Reduce Connection Inequalities:

Speed up the roll-out of high-capacity future-proof digital infrastructures, enhance technology accessibility, and create on-ramps to the digital economy for the excluded to foster innovation, competition, cooperation, as well as inclusion and sustainability

Policy action 1.1: Enable and support the deployment and take-up of high-capacity and robust Fixed, Mobile and Satellite Broadband Connectivity across areas to expand worldwide network coverage and increase connection capacity, also leveraging most advanced technologies

Policy action 1.2: Promote technology accessibility by endorsing public - private partnerships and supporting private efforts to foster meaningful and inclusive connectivity for all, especially, but not limited to, developing countries

Recommendation 2 – Promote Trust in the Digital Ecosystem:

Harmonize regulatory principles to ensure fair competition and efficient markets; promote trust in the digital ecosystem by enhancing cybersecurity and privacy protection, and encourage the adoption of interoperable policy frameworks and common standards to facilitate cross-border data flows

Policy action 2.1: Harmonize regulatory principles and simplify rules for all participants in the digital economy to ensure fair competition and enable efficient markets; foster responsible use and free flow of data with trust leveraging the work of international working groups

Policy action 2.2: Incentivize multilateral dialogue between Governments, International Organizations, in consultation with Businesses and all other stakeholders of digital society to grant responsible state behavior in cyberspace and get broad buy-in for the use of a solid framework on security tools, protocols, and procedures across industries, reflecting their exposure to cyber risk

Policy action 2.3: Support technological innovation with policies that promote interconnection, interoperability, and the adoption of market driven, global, open, and voluntary standards and codes of conduct with the aim of fostering usage of cross-domain solutions and data porting

Recommendation 3 – Support Public and Private Digital Advantage:

Foster Governments' and companies' responsible development and deployment of digital technologies, by leveraging public and private cooperation in R&D, promoting investments and effective use cases sharing

Policy action 3.1: Strengthen long-term public involvement to stimulate R&D in new technologies, while ensuring a fruitful cooperation with the private sector and promoting responsible, sustainable, human-centered, and market-driven development

Policy action 3.2: Facilitate investments in digital technologies (HW, SW) and reorganization processes that enhance companies' and Governments' technological development and cyber protection, by leveraging effective and non-market distorting funding schemes, providing technical advisory services, and stimulating use case sharing, especially for MSMEs

Recommendation 4 – Foster a Digital Ready and Inclusive Society:

Address the existing digital skills gap in the private and public sector by mapping current shortages, up/re-skilling individuals, updating education curricula and encouraging a mindful usage of technologies

Policy action 4.1: Define national strategies to address digital skills gap in private and public sectors, also ensuring that efforts and investments are channeled towards top priorities to grant new job opportunities in all sectors

Policy action 4.2: Improve provision of digital skills at schools and universities to promote the creation of a digital-ready workforce, able to harness the power of digital technologies while recognizing the associated risk

Introduction

Digital Transformation is a key driver of economic development, a fundamental lever in fighting climate change, and a powerful enabler of social inclusion. Four main trends contribute to expanding the potential and the opportunities related to digital technologies:

• Increasing digital and connected population;
• Improving connection quality worldwide;
• Rising adoption of Big Data and Artificial Intelligence technologies;
• Growing Internet of Things and Machine-to-Machine use cases.

Global digital population has nearly doubled over the last nine years and internet users are expected to grow even more – reaching ca. 5.3 Bn in 2023, a 36% increase vs 2018[2] – with the share of connected people rising across all continents, empowering citizens with new opportunities.

Connection quality is rapidly improving worldwide, unlocking more valuable use cases. Evidence shows that a 10% increase in broadband penetration results in a +0.36-1.38% direct impact on GDP growth, with mobile broadband having higher impact than fixed broadband[3].

Big Data and Artificial Intelligence enable significant improvements in companies' efficacy and efficiency through machine learning techniques and advanced analytics to better serve customers. AI market, which grew four times in the last three years and reached USD 2.3 Tn in 2020, is expected to double by 2025 up to USD 4.5 Tn[4].

Internet of Things is projected to unlock value for USD 15 Tn of global GDP by 2025. Share of Machine-to-Machine (M2M) devices is also expected to grow significantly in the upcoming years, accounting for almost 50% of total devices in 2023 based on estimates[5].

Moreover, connectivity infrastructures, as enablers of new products and services, innovative solutions such as cloud and edge computing, and digital technologies are considered to be powerful tools to address climate change and accelerate action to stabilize the earth's temperature, also setting the foundation for a greener recovery.
Indeed, Digital Transformation could help reduce global carbon emissions by up to 15%, contributing decisively to achieve the overall 40% reduction target within 2030 (vs 1990 levels)[6] set by many countries in reference with the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement. Estimates highlight how Artificial Intelligence is a promising ally to accelerate sustainable transformation, able to reduce GHG emission by between 2.6 and 5.3 gigatons of CO2-equivalent (equally to 5-10% of yearly global volume)[7].

Halving emissions requires significant investments and unprecedent technological development. The digital sector can take a strong lead in driving this effort: cloud computing, industrial automation, fixed and mobile networks, among other technologies, already serve as a foundation for more productive and efficient societies. Moreover, frontier technologies such as 5G, Artificial Intelligence, Industry-of-Things and advanced robotics will provide further opportunities to build exponential momentum and make decarbonization and carbon neutrality achievable.

[2] Cisco Annual Internet Report, 2018-2023
[3] ITU Publications, The Economic contribution of Broadband, 2020
[4] Gartner, Statista, 2019
[5] BCG, Reduce Carbon and Costs with the Power of AI, 2021
[6] World economic forum, Digital technology can cut global emissions by 15%. Here's how, 2019, Exponential Roadmap Initiative, 2020
[7] Nielsen, COVID-19 Tracking the Impact on Media Consumption, 2020

With the right policy framework and strong leadership, those technologies will be instrumental to move the society towards a more sustainable and inclusive economy, focused on growing the value of products and services while at the same time reducing waste, pollution and resource consumption[8].

COVID-19 pandemic reinforced the pivotal role of digital as a pillar of global resilience. In this context, three factors have emerged to be critical:

• Worldwide network capacity, reach and security growing in importance;
• Unconnected population risking to be left behind, with digital skills also proving to be a critical driver of digital divide in an increasingly connected world;
• Companies' and Public Administrations' resilience being tested like never before, and digital technologies resulting key to ensure operational continuity.

In 2020, imposed lockdowns and smart working practices replaced the traditional physical ways of social connection and entertainment. Digital media and online communication became the only option for working and participating to social activities. Compared to 2019, media and streaming usage rose by up to 100% in many countries[9], further exacerbating the need of well-sized and stable networks to process a rapidly increasing volume of data. The rise of home-based data traffic, driven by teleworking, education and entertainment, further boosted connectivity demand, ultimately highlighting the need for a faster broadband roll-out.

During the pandemic, people with poor or no access to digital means were uncapable to contribute to the society, further aggravating the impact of the already existing digital divide, both within countries and between developed and emerging economies. A particularly relevant statistics regards young students which, from pre-primary to upper secondary school, in 31% of the cases have not been reached by remote learning solutions[10].

Finally, most companies had to face a twofold disruption: evolving people's habits and changing employees' needs. The private sector had to rely mostly on remote digital access to keep productivity at par and e-commerce has turned into the only possible vector of sales. Internally, challenges comprised evolving working habits with remote working becoming the new normal. Similarly, Public Administrations were forced to migrate most of their services to digital applications to ensure continuity of services and support citizens during the pandemic.

However, the potential of Digital Transformation is yet to be fully realized and is still limited by five structural factors

• Heterogenous network capacity, reach and quality across different regions;
• Gaps and inconsistencies among regulatory principles leading to potential competitive imbalances;
• Lack of trust in digital technologies due to cybersecurity and privacy concerns, as well as issues related to respect for human rights, national security, and digital sovereignty;
• Limited digital offering due to uneven awareness of technology use cases;
• Low digital readiness among companies, citizens, and workers further impacting the take-up of digital solutions.

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[8] UNICEF, COVID-19: Are children able to continue learning during school closures?, 2020
[9] ITU, More urgent than ever: Universal connectivity to bring 3.7 billion people online, 2020
[10] Nokia: Redoing the math–the impact of Covid-19 on broadband networks, 2020

Infrastructure reach, digital skills, and access to connectivity are still limited, especially in lower-income countries, resulting in 3.7 Bn people living without any internet connection[11]. Differences occur also in terms of connection quality, with 20-30% of online population experiencing connection speed lower than 50 MB/s[12]. Even for most advanced technologies, such as 5G, enormous variability emerges across countries[13]. Gaps in connectivity do not just exist between rural and urban communities, but also within larger cities.

Uneven regulatory principles still slow down the development of new products and innovation. Lack of global standards also prevents technology interoperability and exacerbates platform lock-ins, resulting in a significant limitation of use cases.

Cyberattacks and data breaches are increasing in number year by year . With rising amounts of data transacted and essential activities performed through digital channels, it becomes essential to effectively protect users and networks. Lack of trust in the digital ecosystem is resulting in the fragmentation of the digital economy with many governments establishing protectionist measures hampering cross-border data flows.

Offering and development of technological products and services have not fully realized their potential due to uneven public support to R&D and private investments, as well as limited awareness on technology benefits. At the same time, ethical and trust concerns on the potentially harmful use of technology (e.g., those resulting in personal, organizational, and societal adverse effects), increase fears among users.

Moreover, many people still lack basic digital skills and are not ready to navigate online safely and mindfully.

Digital Transformation will reshape jobs and working environment: 14% of total jobs in OECD countries will be impacted by automation and 32% are expected to face significant change in the next two decades[14]. However, during the last ten years, digital-intensive sectors created four out of ten new jobs[15]. It is calculated that investments in information and communications technology infrastructure induce 1.4 to 3.6 indirect jobs for every direct job created[16].

As also stated by the OECD , digital technologies and data are transformational. People, firms and governments live, interact, work and produce differently than in the past, and these changes are accelerating rapidly. With skill mismatches rising among employees, individuals, companies and Public Administrations, it is essential to invest in learning and re-skilling to ensure jobs and equal opportunities for all, while adapting to a fast-changing world. Digital Transformation can speed up the economic recovery and empower people at all levels of society only if the policy environment is oriented towards global cooperation and focused to promote priority-based and actionable strategies. Hence, we call on the G20 to act on the following four Policy Recommendations:

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[11] iDATE Digiworld, 2021
[12] IBM X-force Security index survey, 2019
[13] OECD, Going Digital: Shaping Policies, Improving Lives, 2020
[14] World Bank ICT, Broadband and job creation: Policies promoting broadband deployment and use will enable sustainable ICT-based job creation., 2012
[15] OECD, Going Digital: Shaping Policies, Improving Lives, 2020
[16] GeSi, Global SMARTer20301 study, 2020

1. Speed up the roll-out of high-capacity future-proof digital infrastructures, enhance technology accessibility, and create on-ramps to the digital economy for the excluded to foster innovation, competition, cooperation, as well as inclusion and sustainability;

2. Harmonize regulatory principles to ensure fair competition and efficient markets; promote trust in the digital ecosystem by enhancing cybersecurity and privacy protection, and encourage the adoption of interoperable policy frameworks and common standards to facilitate cross-border data flows;

3. Foster Governments' and companies' responsible development and deployment of digital technologies, by leveraging public and private cooperation in R&D, promoting investments and effective use cases sharing;

4. Address the existing digital skills gap in the private and public sector by mapping current shortages, up/re-skilling individuals, updating education curricula and encouraging a mindful usage of technologies.

Recommendation 1 – Reduce Connection Inequalities:

Speed up the roll-out of high-capacity future-proof digital infrastructures, enhance technology accessibility, and create on-ramps to the digital economy for the excluded to foster innovation, competition, cooperation, as well as inclusion and sustainability

Policy Actions

1.1 Enable and support the deployment and take-up of high-capacity and robust Fixed, Mobile and Satellite Broadband Connectivity across areas to expand worldwide network coverage and increase connection capacity, also leveraging most advanced technologies

1.2 Promote technology accessibility by endorsing public - private partnerships and supporting private efforts to foster meaningful and inclusive connectivity for all, especially, but not limited to, developing countries

Leading Monitoring KPI - *Owner: G20 Countries*	Baseline	Target
% of People Connected to the Internet *Source: International Telecommunication Union (ITU)*	51% (2019)	70% (2024)

SDG impacted:

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

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 and 8.2 in sustaining per-capita-GDP and technological upgrading and innovation. 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, fostering technological empowerment and connectivity infrastructure development, supports the accomplishment of SDG 9, in particular of target 9.c.1 "proportion of the population covered by a mobile network". By granting the same level of connectivity in urbanized and rural areas, reducing inequalities in technology access, it would also benefit target 10.1, sustaining income growth of the bottom 40 per cent of the population.

People

Planet

Prosperity

G20 Italy Priorities:
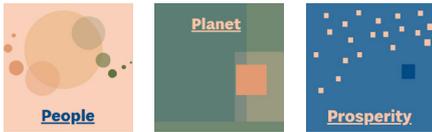
Recommendation 1 commits towards the achievement of all three principles of the G20 Italian Presidency: **People, Planet and Prosperity.**

Policy Action 1.1 aims at granting higher reach of networks, promoting the connection for all, enhancing businesses' and People's capabilities and potential for recovery, development, and growth, also impacting global Prosperity.
A broader expansion of connectivity would also benefit the Planet and a transition towards digital means would result in more sustainable businesses: ICT solutions will play a pivotal role in detaching economic growth from CO_2 production, with every 5% increase in access to digital technology dwindling emissions by around 1.6% .

Finally, Policy Action 1.2, focused on increasing accessibility of device and service at all level of societies, would reduce inequalities granting a more equal condition for People.

Context

Exhibit 1 | Rising global population

Connectivity, as a core enabler of Digital Transformation, has been a pillar of economic growth in recent years. Connected population is rising, with internet usage growing across areas and regions of the world.

Global Internet users' growth 2018-2023
(B, 2018-2023)

+36%

Year	Value
2018	3.9
2019	4.2
2020	4.5
2021	4.7
2022	5.0
2023	5.3

Internet users as a percentage of regional population

Region	2018	2023
Global	51%	66%
Middle East and Africa	24%	35%
Asia Pacific	52%	72%
Latin America	60%	70%
Central and Eastern Europe	65%	78%
Western Europe	82%	87%
North America	90%	92%

- **Internet population** is predicted to **increase by ~36%** in 5 years
- **Internet user's penetration** over total population is **growing by 15 p.p.** over 5 years
- **Asia Pacific** showing the higher percentage increase **(~20 p.p)** of all the global regions

Source: Cisco Annual Internet Report 2018-2023

The higher penetration of internet users has also been facilitated by 3GPP connectivity. Mobile internet is, indeed, the primary mean of internet access for most of the world's population, and it also incentivizes new waves of innovation, including the App economy[17].

3GPP created a thriving global ecosystem with 8 Bn mobile connections in 2020, set to rise to 8.8 Bn by 2026. Nevertheless, many of those who are not connected to the internet live within the coverage of a mobile network, indeed 95% of global population in 2020 is covered by 3G technology and 80% is covered by LTE[18].

The ever-faster connection speed on both fixed and mobile broadband infrastructures is unlocking more valuable use cases, resulting in additional GDP growth. It has been demonstrated[19] that there is a statistically relevant correlation between broadband penetration and countries' GDP growth: for every 10 percentage point increase in broadband penetration - either fixed or mobile - GDP increases by respectively 0.77% and 1.50%.

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[17] The App Economy refers to the smartphone and tablet revolution whereby a mobile application is available for just about everything.
[18] Ericsson, Ericsson Mobility Report, 2020
[19] International Telecommunication Union (ITU), The Economic Contribution Of Broadband, 2019

GDP growth impact of an increase in 10% of fixed and mobile broadband penetration
(% of GDP increase per 10 pp increase in broadband penetration)
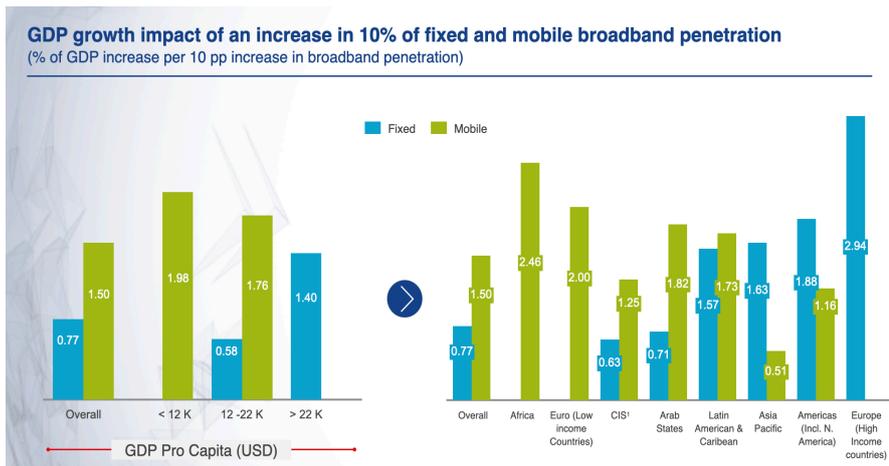
Source: ITU publications on the Economic Contribution of Broadband 2020, Digitalization and ICT Regulation regional studies, includes 34 African countries, 18 American countries, 14 Arab States, 18 Asia Pacific Countries, 8 Commonwealth Independent States and 38 European Countries

In the future, significant economic contribution is expected to be also provided by 5G development, with related use cases predicted to add USD 3.8 Tn of gross output by 2035 and supporting 22.8 Mn new jobs[20].

COVID-19 crisis has impacted people in many countries, significantly influencing their daily lives. Consumers saw resilient networks as a vital factor: according to Ericsson Mobility Report 2020, 83% of surveyed people stated ICT as a key resource to cope with the crisis[21]. Indeed, connectivity has proven to be a major driver in enabling global response to the COVID-19 epidemic. 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%[22], the use of virtual communication tools rose 10 times, and online streaming increased by more than 50% all around the globe[23].

Unfortunately, as the world "moves" online, the impact of a digital divide between people with and without internet access becomes more pronounced with progressively evident implications. Many students, required to attend schools from home without a reliable connection or an appropriate device, have been cut off from educational opportunities. Worldwide connectivity gaps are not limited only to rural areas, even within the same cities, certain zones are less served than others.

Besides the recognized importance of accelerating the deployment of connectivity infrastructure, worldwide network coverage is still heterogeneous, with poor access to devices and services as well as lack of digital skills, among others, representing relevant barriers for internet adoption[24], resulting in the fact that nearly 50% of the world is still unconnected[25], especially in developing countries.

[20] *World Economic Forum, 5G Outlook Series: Enabling Inclusive Long-term Opportunities, 2021*
[21] *Ericsson Mobility Report, 2020*
[22] *OECD, Keeping the Internet Up and Running in times of crisis, 2020*
[23] *Nielsen COVID-19 Tracking the Impact on Media Consumption, 2020*
[24] *ITU, Measuring digital development: Facts and figures, 2020*
[25] *UNESCO, New report on global broadband access underscores need to reach the half of the world still unconnected, 2019*

Policy action 1.1: Enable and support the deployment and take-up of high-capacity and robust Fixed, Mobile and Satellite Broadband Connectivity across areas to expand worldwide network coverage and increase connection capacity, also leveraging most advanced technologies

High-capacity and robust connectivity networks, intended as infrastructures and technologies capable of delivering gigabit speeds, allow businesses and communities to grow their competitiveness, quality of life, education level, and economic prosperity.

The enhancement of new generation broadband networks, in particular expanding their reach and upgrading their performances, is crucial to accomplish economic recovery and growth. Moreover, existing social imbalances risk to further widen if technologies and connectivity continue to spread heterogeneously.

Granting future-proof networks requires adequate public and private cooperation to stimulate innovation and create financial conditions for 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.

In this context, we identified two vectors of action to shape and frame the decades to come:

The G20 should stimulate high-capacity network investments to benefit individuals, companies, and the economy at large by encouraging new business models, promoting technology neutrality, fostering transparent and efficient permit granting procedures, and facilitating broadband network deployment
The G20 should support operational flexibility and encourage markets to innovate by fostering fair competition to boost innovation and cooperation and by promoting policy measures to support network investments, leveraging both new and already existing business models (which expand network coverage and speed-up roll-out).

In addition, reasonable taxation, pricing policies, and long-term technology-neutral licenses have a major impact on network coverage unlocking greater investments. In certain instances, regulations are already in place (e.g., at European Union level[26]) but need to be enforced and implemented properly to ensure overall financial sustainability.

The G20, when facilitating private investments in high-capacity and future-proof digital infrastructures, should restrict the use of direct public interventions only in case of market failures. Moreover, it is essential to facilitate the overall network deployment process. It means, for example, overcoming barriers such as permitting delays or harmonizing radio frequency exposure values which might result in an uneven network deployment. This would streamline and lower barriers to entry and promote competition.

In this regard, the Council Conclusions on Shaping Europe's Digital Future held on 9 June 2020 stressed that the COVID-19 pandemic demonstrated the need for fast and ubiquitous connectivity. This situation further calls to develop a set of best practices to reduce the cost of network deployment[27].

To further increase network reach, G20 members should promote measures aimed at providing operators with access to global or regional harmo-

[26] *European Commission, A Connectivity Toolbox to foster EU-wide advanced connectivity, 2020*
[27] *Ericsson, Digitalization with 5G enables further acceleration of climate action, 2021*

nized pioneer spectrum for 5G. The early assignment of sufficient amounts of spectrum have a major impact on networks' coverage since they would lead to greater network investment. In Europe, for instance, only 25.5% of 5G spectrum has been released to Member States[28]. The slow pace is, in large part, due to a focus on short-term profitability, rather than long-term benefits. Finally, G20 governments should also promote information campaigns highlighting the benefits of 5G for citizens and companies, recalling that 5G networks deployment is compliant with international regulations on electromagnetic emissions.

The G20 should ensure connectivity for the unconnected and enhance network coverage and connection quality for the underserved by encouraging private sector network expansion and by leveraging mechanisms such as public-private partnerships, also ensuring their neutrality with respect to technologies and business models

Because of existing limitations of network coverage and shortfalls of infrastructure, significant capital investments are required to meaningfully connect more people to the internet[29].

This is particularly true if we consider the targets set by many countries in terms of connectivity reach and performance: the European Commission has the objectives of ensuring 30 Mbps connection or more for all citizens, providing access to 1 Gbps for all schools, transport hubs, main providers of public services and digitally intensive enterprises, granting download speed of at least 100 Mbps (to be upgraded to 1Gbps) for all European household by 2025 and uninterrupted 5G wireless broadband coverage for all urban areas and major roads and railways[30]. Indeed, by 2030, all EU households should have gigabit connectivity and all populated areas should be covered by 5G[31].

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.

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[32].

The International Telecommunication Union (ITU) estimates that USD 428 Bn of additional investment will be required over ten years to deliver high-quality broadband to the world's unconnected population[33]. Specific policy measures could be dedicated to the areas that are more challenging to cover: approaches such as offering discounted spectrum in return for obligations to cover rural and remote areas, public - private partnerships and community networks could be explored.

Private sector expansion should be the top priority for network development. In areas where no self-sustaining interventions are possible, high-speed networks should be promoted in a technology- and provider-neutral manner. If instruments to promote private sector efforts do not work, Universal Service Funds (USFs) could be considered. USFs are a system of subsidies and fees intended to promote universal access to telecommunications services[34].

[28] Broadband commission for sustainable development, State of Broadband, 2019
[29] European Commission, Connectivity for a European Gigabit Society, 2020
[30] European Commission, Connectivity for a European Gigabit Society, 2020
[31] European Commission, Europe's Digital Decade: Commission sets the course towards a digitally empowered Europe by 2030, 2021
[32] OECD, Recommendation of the Council on OECD Legal Instruments Broadband Connectivity, amended 2021
[33] Alliance for affordable internet, Affordability Report, 2020
[34] US Federal Communication Commission, accessed 2020

When adopting this solution, it is important to secure that USFs are used for the objective of expanding connectivity coverage and adoption, ensure that USFs are efficiently and effectively used for the intended aim, do not favor any particular technology or business models, and work in a complementary manner with already existing business models to expand the reach of broadband service in locations where operators have been unable or unwilling to invest so far.

Public involvement in fostering the take-up of high-capacity and robust fixed, mobile and satellite broadband connectivity, capable of delivering gigabit speeds, can also comprise the provision of demand-side measures such as voucher schemes without distorting competition dynamics, private investments and existing business models.

The European Commission WiFi4EU initiative, for example, grants free Wi-Fi access in public spaces. The initiative, providing municipalities with the opportunity to apply for EUR 15 K vouchers, has invested EUR 133 Mn reaching a total of eight thousand different municipalities[35].

Exhibit 3 | 8000+ vouchers used by different countries benefiting from WiFi4EU initiative
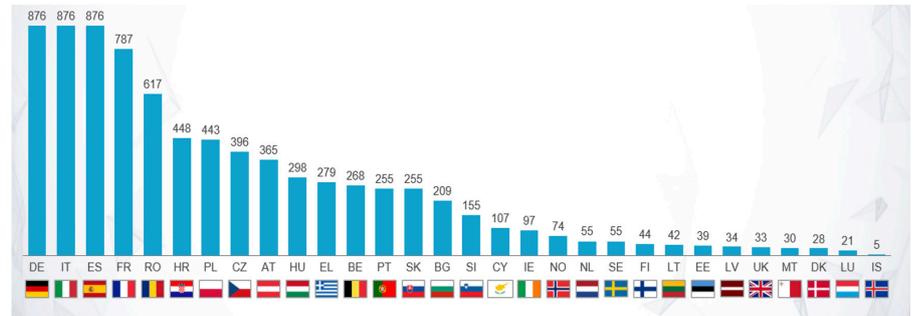
Source: WiFi4EU, Adherence Data updated on third public tender, 2020

In addition, public involvement should also entail the provision of social and connectivity vouchers to underserved households and businesses. While respecting the principle of technological neutrality, vouchers should be granted to the best available high-capacity and robust fixed mobile and satellite broadband networks capable of delivering gigabit speeds with a view to foster their take-up.

Policy action 1.2: Promote technology accessibility by endorsing public - private partnerships and supporting private efforts to foster meaningful and inclusive connectivity for all, especially, but not limited to, developing countries

The COVID-19 crisis has demonstrated the critical importance of devices[36] and services in driving robust, resilient and well-functioning societies and economies.

Nevertheless, today 3.7 Bn people remain offline[37]. Constrained access to services and devices is one of the main aspects making individuals unable to benefit from the opportunities arising from the ongoing Digital Transformation[38].

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[35] European Commission, WiFi4EU | Free Wi-Fi for Europeans, 2020
[36] in Europe and in Italy in particular, several Telco operators have tackled the digital accessibility issue offering devices to hospitals, schools, and Public Administrations to help overcome the pandemic impact
[37] ITU, Measuring digital development: Facts and figures 2020, 2020
[38] Broadband commission for sustainable development - Global Goal of Universal Connectivity Manifesto, accessed 2020

Given that only five years remain to achieve the Broadband Commission for Sustainable Development[39] target of reaching 75% of worldwide internet user penetration[40], it is important for G20 countries to focus on concrete and actionable proposals:

The G20 should increase technology accessibility for individuals by using public levers such as promoting clear and transparent National Broadband Plans with rigorous advocacy frameworks and lowering market entry barriers for companies

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[41], but numerous countries are still facing challenges to reach this goal.

The G20 should promote the development of National Broadband Plans (NBPs) as policy documents crucial in defining the goals and aspiration of ICT sectors over the medium and long term. Furthermore, NBPs have positive impact on increasing countries' meaningful access, representing the actual condition in which people can access the internet every day using an appropriate device with sufficient data and a fast connection.

NBPs should also be designed to set effective accessibility targets and track their 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.

The importance of drafting up-to-date and tangible National Broadband Plans has been also stressed by the European Commission, which underlined the importance of ensuring that National Digital Agendas and Broadband Plans include concrete measures to reach the EU's 2025 connectivity objectives with the appropriate state aid rules[42].

Ensuring that technology is equally accessible does not have to be limited only to unserved, remote or in-need population. The World Health Organization estimates that 1 Bn people live with disability[43], and the International Telecommunication Union highlighted the importance of improving their access to ICTs[44], especially considering that assistive technology can be life-changing for disabled individuals[45]. Access to technology should not be restricted by our vision, hearing, mobility, mental health, learning disabilities or cognitive differences; hence, information communication technologies and devices should be designed to be accessible to all. In particular, highly specialized and assistive technologies such as screen readers and magnification for blind and visually impaired people as well as text-to-speech software for individuals with neurodivergent conditions go well beyond standard features built into technology today, but should be offered as well to grant true inclusion for everyone.

Finally, 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)[46].

[39] *The commission has been established in May 2010 with the aim of boosting the importance of broadband on the international policy agenda, and expanding broadband access in every country as key to accelerating progress towards national and international development targets, Broadband commission for sustainable development, accessed 2020*
[40] *International telecommunication union (ITU), 2018*
[41] *Alliance for affordable internet, Affordability report, 2020*
[42] *European Commission Services, Recovery and Resilience Plans, example of component reforms and investments, 2020*
[43] *World Health Organization, Disability and Health Report, 2020*
[44] *ITU, Accessibility study group, 2020*
[45] *Forbes, For Disabled People, Access To Assistive Tech Is A Human Right Not An Employment Perk, 2020*
[46] *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*

G20 should promote the development of policies to bridge physical and digital infrastructures, 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, thereby reducing inequalities.

Even though the internet and technologies' penetration rates in rural zones have been rising in recent years, there is still a gap compared to urban areas. According to ITU 2019 data, about 72% of households living in urban areas globally have access to the Internet at home, almost twice as much as in rural areas (38%)[47].

To bridge the digital divide, it is important to strengthen the infrastructure and improve network coverage and penetration. Digital technologies can sustain rural population also by enhancing agricultural production, supporting public services (including healthcare and education) and their governance.

[47] *International Telecommunication Union, Household Internet access in urban areas twice as high as in rural areas, 2020*

Recommendation 2 – Promote Trust in the Digital Ecosystem:

Harmonize regulatory principles to ensure fair competition and efficient markets; promote trust in the digital ecosystem by enhancing cybersecurity and privacy protection, and encourage the adoption of interoperable policy frameworks and common standards to facilitate cross-border data flows

Policy Actions

2.1 Harmonize regulatory principles and simplify rules for all participants in the digital economy to ensure fair competition and enable efficient markets; foster responsible use and free flow of data with trust leveraging the work of international working groups

2.2 Incentivize multilateral dialogue between Governments, International Organizations, in consultation with Businesses and all other stakeholders of digital society to grant responsible state behavior in cyberspace and get broad buy-in for the use of a solid framework on security tools, protocols, and procedures across industries, reflecting their exposure to cyber risk

2.3 Support technological innovation with policies that promote interconnection, interoperability, and the adoption of market driven, global, open, and voluntary standards and codes of conduct with the aim of fostering usage of cross-domain solutions and data porting

Leading Monitoring KPI - *Owner: G20 Countries*	Baseline	Target
% of Countries with Data Protection and Privacy Legislation *Source: United Nations Conference on Trade and Development (UNCTAD)*	66% (2020)	100% (2024)

SDG impacted:

Recommendation 2 contributes to the achievement of UN's SDG **7: Affordable and Clean Energy, 8: Decent Work and Economic Growth, 9: Industry Innovation and Infrastructure, 13: Climate Action 16: Peace, Justice and Strong Institutions and 17: Partnership for the goals.**

Policy Action 2.1, 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 by setting harmonized global standards for technology and developing more efficient interoperability mechanisms. Moreover, the ability to derive value from data would take resource efficiency and production flexibility to the next level, sustaining target 7.3 in improving energy efficiency and target 13.3 focused on improving capacity on climate change mitigation.

Moreover, it contributes to the achievement of target 16.3 by promoting the rule of law at national and international level, and target 17.16 by enhancing the global partnership for sustainable development, ensuring harmonized perspectives on technological development, while promoting cohesiveness and cooperation within and between countries.

Policy Action 2.2, ensuring multilateral dialogue and common regulatory principles on cybersecurity among nations, supports target 16.3 in "promoting the rule of law at national and international level". Furthermore, by ensuring the implementation of risk-based technical and procedural requirements across sectors, it safeguards each and every layer of the value chain, granting more resilient infrastructures (target 8.2), while at the same time ensuring industries' sustainable growth (target 9.1).

Policy Action 2.3 further commits to the realization of target 9.2 by fostering interoperable standards. Such measures would mitigate platform lock-ins and promote fairer competitive environment, thus building towards a more inclusive environment.

G20 Italy Priorities:

Recommendation 2 commits towards the achievement of Italy G20's principles of **People, Planet and Prosperity**, by promoting harmonization of principles, fostering fair competition, and granting trust in the technological ecosystem.

Policy action 2.1, ensuring that consistent regulatory principles are aligned with sustainability priorities, will eventually benefit the Planet, as well as harmonizing approaches will stimulate competition and innovation, thus benefitting Prosperity and international growth. Finally, acting on users' trust in the ecosystem by promoting data flow while protecting data privacy would benefit People guaranteeing an appropriate balance between data accessibility and data security.

Policy Action 2.2, calling for a framework on cybersecurity tools, protocols, and procedures would eventually shield People from cyberattacks and data breaches. Moreover, it will prevent unnecessary losses and waste of capital by raising awareness on data protection at corporate level, thus ensuring all resources are effectively conveyed towards growth and innovation, and ultimately contributing to global Prosperity.

Policy action 2.3 by defining common standards for technology interoperability across sectors and industries where required, would foster the usage of cross-platform and cross-domain solutions and avoid use case limitation and platform-specific lock-in, stimulating the usage of open-source hardware and software and contributing to global technology development and Prosperity.

Context

The evolution of digital technology is reaching new heights, enabling new business models, supporting innovation, and redefining industry's traditional boundaries. Digital Transformation is solving complex challenges providing solutions to businesses and communities during the pandemic in a broad range of sectors including healthcare, education, energy, finance, and transportation.

For markets to work and interact effectively, a fair, transparent, and predictable regulatory environment must be guaranteed. Nonetheless, global coordination on rules and regulatory principles is not keeping the pace with technological evolution, thus creating imbalances and distortions across countries, legislations, industries, and companies, ultimately impacting the overall trust in the digital ecosystem as well as the market efficiency.

Moreover, with new digital business models growing in importance, there is an increasing need to ensure that regulatory approaches, fostering fair competition through the whole digital value chain, remain open and flexible enough to capture the ever-changing evolution of technology as well as address its most critical challenges.

Harmonization of principles, adopted through multi-stakeholder consultations, should not encompass only international regulatory principles, but should also address national and industry-specific technological standards given their significant importance in growing digital applications such as Internet of Things (IoT) and Machine-to-Machine (M2M) communication also enabled by networks and cloud technologies.

The global IoT end-user spending is expected to grow significantly from 2019 to 2025 from USD 212 Bn to USD 1,567 Bn[48]. Similarly, as the main pillar of IoT development, M2M communication is predicted to grow as well. Incidence of M2M devices over total is projected to reach 50% in 2023, up from 36% in 2019.

Incidence of M2M devices on total devices
(% over total devices, 2019 - 2023)

Global forecasted IoT end-user spending
(Worldwide market size; B USD; 2019 - 2025)
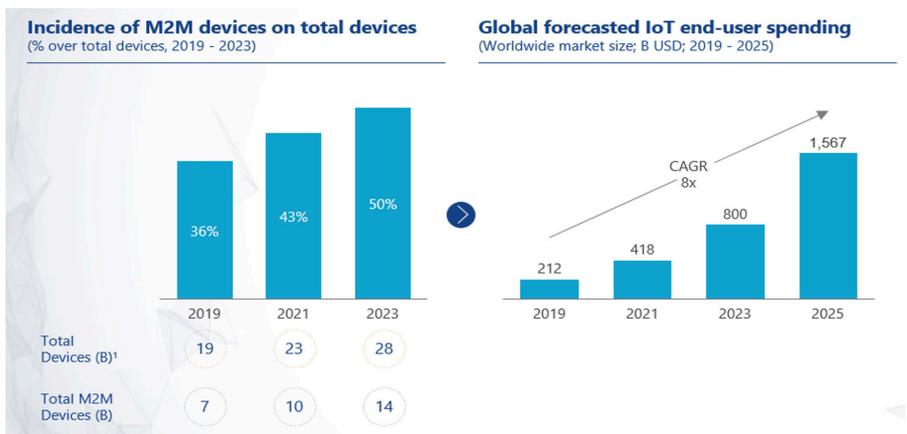
Exhibit 4 | M2M incidence over total devices and global forecasted IoT end-user spending

Source: Cisco Annual Internet Report 2018-2023

The rise of M2M communication and connected industrial sensors for Industry 4.0 involves an unparalleled need of data flows and systems interoperability across borders and technological domains. On this, the presence of gaps and overlaps in technology standards, intended as "missing or duplicate elements in the IoT standardization landscape"[49], may hinder the development of open platforms and open-source communities.

Indeed, the lack of interoperability in IoT systems represents one of the most significant barriers to the widespread of IoT adoption. If IoT devices cannot communicate with each other or with different protocols, their potential gets significantly reduced. From an end-user perspective, for example, having interoperable devices would improve customer experience and promote technology adoption. At the same time, from a business perspective, interoperability enables richer data collection, allowing corporations to have better visibility on potential improvements on processes, products, and services.

However, system interoperability does not have to be limited to IoT devices and industrial applications. Offering seamless interfaces would also enhance the way citizens use digital products and services. Examples are Door-to-Door mobility or logistics applications expected to be fully deployed in the future. With smart mobility on the rise, autonomous vehicles as well as shared and public mobility services are expected to become connected in the coming years, benefitting users with smoother customer journeys, also contributing to the reduction of global emissions[50].

Promoting data free flow with trust (DFFT), which have to rely on effective legal frameworks for privacy and data protection (with the consent of consumers), requires a global agreement on regulatory principles and standards as well as promoting cyber trust and protection. Having efficient and harmonized data sharing principles will be pivotal to boost the data economy and to achieve UN's SDGs targets[51].

With internet usage and data exchanges on the rise, concerns in the digital security environment are growing significantly. The number of Distributed Denial of Service (DDoS) attacks, for example, are expected to nearly double, from 7.9 Mn in 2018 to 15.4 Mn in 2023, with a CAGR of +14%[52].

Network infrastructures are not the only assets to protect. Wrong procedures and behaviors should be addressed as well: 43% of company data breaches are driven by human errors. Moreover, cyberattacks may also impact companies' long-term competitive advantage: indeed, cyberattacks are often a mean to get access to companies' industrial secrets and Intellectual Property.

Exhibit 5 | Cybersecurity growing in importance as internet usage spread
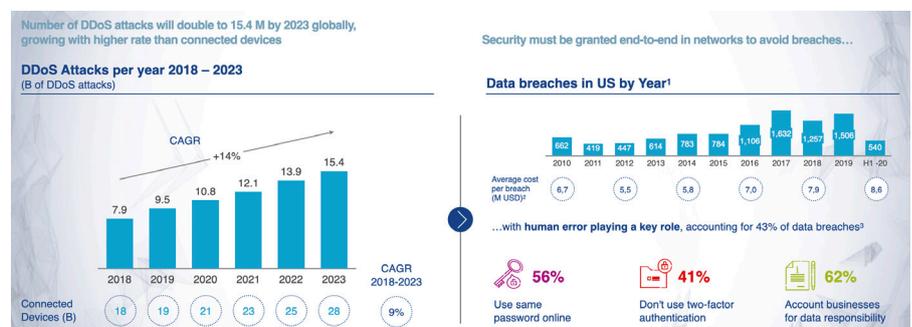
1. United States; Identity Theft Resource Center; 2005 to H1 2020; 2.United States; Ponemon Institute; IBM; 3. IBM X-force Security index survey 2019; Gemalto survey, BCG "A Great Digital Identity Solution Is One You Can't See" 2019

Source: Cisco Annual Internet Report 2018-2023; Cyber Security Ventures 2020

[49] Alliance for Internet Of Things Innovation, High Priority IoT Standardization Gaps and Relevant SDOs, 2018
[50] BCG, Shaping the Future of Mobility, 2020
[51] BCG, Sharing Data to Address Our Biggest Societal Challenges, 2021
[52] Cisco annual internet report 2018-2023, 2020

The state of the art in cybersecurity legislation comprises a heterogenous landscape of different laws, regulations, and policies. This fragmentation does not allow for an effective international cooperation on cybersecurity issues.

Addressing these concerns will require global collaboration across different stakeholders asking both companies and governments to think more expansively about their roles in digital safety and trust. In particular, it is of fundamental importance to ensure protection of critical infrastructures, including hospitals, government data centers and all others indicated by the United Nations' Group of Governmental Experts and Open-Ended Working Group[53].

In order to create a coordinated regulatory framework that addresses the needs of a global digital economy – promoting fair competition, ensuring free flow of data, granting interoperability and trust in the digital ecosystem as well as addressing grey areas of jurisdiction within the cyber space –international policy makers should examine firstly which existing laws and rules apply to new technologies.

Where appropriate, governments should define which technology-neutral measures promote innovation, while stimulating private investments and encouraging inclusion and multi-stakeholder collaboration. Regulatory frameworks need to be open and flexible enough to capture the ever-changing evolution of technology, while at the same time making sure rigorous principles are adopted among all stakeholders.

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

• Harmonize regulatory principles and simplify rules for all participants in the digital economy to ensure fair competition and enable efficient markets; foster responsible use and free flow of data with trust leveraging the work of international working groups;

• Incentivize multilateral dialogue between Governments, International Organizations, in consultation with Businesses and all other stakeholders of digital society to grant responsible state behavior in cyberspace and get broad buy-in for the use of a solid framework on security tools, protocols, and procedures across industries, reflecting their exposure to cyber risk;

• Support technological innovation with policies that promote interconnection, interoperability, and the adoption of market driven, global, open, and voluntary standards and codes of conduct with the aim of fostering usage of cross-domain solutions and data porting.

Policy action 2.1: Harmonize regulatory principles and simplify rules for all participants in the digital economy to ensure fair competition and enable efficient markets; foster responsible use and free flow of data with trust leveraging the work of international working groups

Competitive neutrality within markets[54] is essential for well-functioning regulatory regimes and for the diffusion of the Digital Transformation in a fair and competitive manner. Regarding the harmonization of the current regulatory principles, we propose three priority areas to focus on:

The G20 should harmonize regulatory principles and simplify rules for all participants in the digital economy to promote competitive and efficient markets building on the frameworks already developed by international fora
Promoting fair competition and granting international alignment on regulatory principles is critical to ensure the right environment for digital players, belonging to different stages of the value chain, to innovate. Regulatory differences between established and new digital players must be removed, and outdated regulations revised, when appropriate, to foster competitive markets and promote innovation.

To do so, the G20 should consider cooperating with international working groups and fora to identify strategies and approaches for actions across countries and industries.

In the Digital Economy, one of the most relevant topics is represented by the investigation on where value is created, given its direct implications on fiscal treatment. While countries agree that the profit of a multinational company should be taxed in the jurisdictions in which it creates value, there are different interpretations on how to define value (e.g., users' location, company's HQ).

At present, digital service taxes differ significantly in their structure from country to country, also having different scope, thresholds, and maturity[55]. Recently, the Group of Seven (G7) advanced economies reached an agreement to back a minimum global corporate tax rate of at least 15%, setting the stage for a global consensus towards international digital taxation guidelines. Such consensus must be achieved in all geographies and must consider countries' specific economic, social and demographic conditions.

We call on G20 countries to garner their collective efforts and act as a medium of discussion through a coherent and coordinated approach to move swiftly towards a global consensus-based and comprehensive digital taxation framework that can be applied equally to all segments of the digitalized economy and does not discriminate or create competitive distortions.

The G20 should promote the development of a trustworthy digital ecosystems, enacting comprehensive and coherent international and national privacy regulatory principles based on the consensus reached by member states, anchored to transparency, consumer empowerment, corporate responsibility, and enforcement

With increasing usage and sharing of personal data, it is essential to protect individual privacy. Therefore, it becomes a priority to harmonize international regulatory approaches on data protection and privacy with the goal of increasing mutual trust on how personal data is treated, used and monetized.

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[54] For example between firms of different parent nationality, various technologies, or existing firms and new entrants
[55] Tax Foundation, "What European OECD Countries Are Doing about Digital Services Taxes", 2021

To do so, it is pivotal to establish a set of principles and an action plan ensuring the development of national privacy regulatory principles that include a globally harmonized framework for effective and comprehensive privacy and data protection while ensuring innovation, also putting concrete mechanisms in place to facilitate cross-border data flows with trust. To avoid fragmentation of the data economy it is also essential to prevent domestic limitations to cross-national data flows.

The G20 should therefore encourage a consistent and balanced adoption of national and international regulatory principles on critical and most innovative areas, such as personal data and Intellectual Property.

Moreover, a trustworthy digital environment for citizens, customers and companies can only be achieved if they safely interact with each other. In the digital space, people need to know the identity of who they are dealing with. Whether it is an individual trying to get a passport or a merchant needing to confirm that a client is who they claim to be, proving trusted digital identities today takes intensive effort and significant cost.

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 wide range of electronically captured and stored information ranging from legal digital identities and credentials to alternative data such as social media behaviors, digital payment patterns and mobile usage statistics. Digital Identities are also a lever for Governments, financial institutions, digital platforms, and international organizations to foster inclusion in the digital economy while also protecting data privacy.

The G20 should foster responsible access and sharing of data and enable Data Free Flow with Trust (DFFT) across borders by adopting consistent high-level guidelines, also supporting their implementation across individuals, firms and governments

Data access and sharing is estimated to generate social and economic benefits worth between 0.1% and 1.5% of GDP in case of public sector related data, and between 1% and 2.5% of GDP when accounting for private sector data[56]. The OECD estimates that the effective usage of data can boost productivity and improve products, processes, organizational methods, and markets. OECD also suggests that firms leveraging data, exhibit faster labor productivity growth by 5% to 10%[57].

However, despite a rising need for data and evidence of its economic and social benefits, data access and sharing have not achieved their full potential yet.

Individuals, businesses, and governments often face barriers to data access. From a 2018 study, out of 129 companies surveyed, 60% did not share data at all with other players and 58% did not reuse data obtained from other companies. When this type of gridlock occurs, data ecosystems fail to thrive, and value creation is limited[58]. Furthermore, existing regulatory differences, are present not only across borders but also across different sectors, and risk to skew the competition ground, limiting the capacity of all companies to innovate.

[56]OECD, Enhancing Access to and Sharing of Data: Reconciling Risks and Benefits for Data Re-use across Societies, 2019
[57]OECD, Mapping approaches to data and data flows, 2020
[58]BCG, Simple Governance for Data Ecosystems, 2020

To encourage and enhance data free flows for the benefit of all, also ensuring equal approaches to different sectors, a coherent data policy framework is needed. Major challenges need to be addressed in continuity with the effort of international working groups as well as the one of International for standard setting such as the ASEAN Data Management Framework[59], the WTO's JSI on E-Commerce[60], or the OECD Initiative on Data Governance for Growth and Well-Being[61]. The following actions should be undertaken:

• The G20 should promote a coherent approach to data policy including partnership with industries and international organizations to consider how to develop data classification frameworks that could help organizations and institutions categorize anonymized and pseudonymized data with the goal of creating an agreed language on data flows;

• The G20 should facilitate the free flow of data in ways that align with the rule of law and the protection of individual rights and freedom (including privacy). In doing so, the G20 should avoid data protectionism without undermining states' rights to regulatory autonomy on data protection and privacy;

• The G20 should encourage the development of guidelines to ensure that data portability requirements are consistent, where appropriate and relevant, and provide sufficient guidance for their implementation.

Policy Action 2.2: Incentivize multilateral dialogue between Governments, International Organizations, in consultation with Businesses and all other stakeholders of digital society to grant responsible state behavior in cyberspace and get broad buy-in for the use of a solid framework on security tools, protocols, and procedures across industries, reflecting their exposure to cyber risk

As B20, we believe that the ambitious goal of having a cybersecure ecosystem will only be achievable through international cooperation and mutual commitment. Given the pivotal role that cybersecurity progressively plays in our everyday life - both as citizens and as workforce members - we identified two core areas for the G20 to focus on:

The G20 should promote multilateral and multi-stakeholder discussions, leveraging global fora and working groups on cybersecurity-related topics and ensure the establishment of national cybersecurity agencies with clear agendas, effective governance mechanisms and enforcement rights

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.

Launched in 2014 by the Institute of Electrical and Electronics Engineers (IEEE) Computer Society and Future Directions Committee, the Cybersecurity Initiative (CYBSI) could serve as a starting point to build upon.

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 to replicate policies that already proved to be effective elsewhere. For this reason, the G20 could leverage on other cross-country multi-stakeholder dialogues that have already been launched.

[59]*ASEAN Digital Senior Officials, ASEAN Data Management Framework and Model Contractual Clauses for Cross-Border Data Flows, 2021*
[60]*World Trade Organization, Joint Statement Initiative on E-commerce*
[61]*OECD, Initiative on Data-driven innovation for growth and well-being official site, accessed 2020*

First, on the OECD "Global Forum on Digital Security for Prosperity", bringing together experts and policy makers to foster the sharing of good practices on digital security risks prevention. International debates lead to mutual learning and convergence of views, also influencing public policy discussions contributing to the development of widely agreed principles[62].

Second, on the Global Forum for Cyber Expertise (GFCE), supporting the adoption of a cyber Programme of Action (PoA) in the context of the General Assembly of the United Nations (UNGA)'s First Committee to promote accelerated adoption of norms, rules, and principles of responsible state behavior within the cyber space.

Also some cutting-edge policies developed at national level have formed the basis of emerging international norms: for example, the US National Institute of Standards and Technology (NIST)'s cybersecurity Framework has established a baseline dialogue around the globe on risk-based approaches to cybersecurity and the UK Government Code of Practice paved the way for European Telecommunications Standards Institute's (ETSI) technical specification for consumer IoT security[63].

In this context, we further stress the need for national cybersecurity agencies (NCAs) to align at 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 prevention, detection, and response. At the same time, the G20 should ensure that NCAs have the correct governance, mandate and execution/enforcement rights enabling them to effectively act on the whole spectrum of their tasks.

NCAs should also enhance companies understanding on cybersecurity issues and prevention methods with dedicated programs such as Singaporean SG Cyber Safe Program, a concerted effort by the Government to help enterprises better protect themselves in the digital domain and raise their cybersecurity posture[64].

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

Finally, the G20 should champion the implementation of shared norms, rules, and principles of responsible state behavior in cyberspace as adopted by consensus in the March 2021 UN General Assembly First Committee[65] 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 apply. They also endorsed recognition of further obligations for countries to promote international peace and security in the online environment.

The implementation of these norms however remains rather incomplete. The result is an increase in both costs and risks for businesses and other stakeholders. The G20 should lead by example and commit to fully implementing rules and principles resulting in responsible state behavior and periodically review progess, also calling on non-G20 countries to do the same.

[62] OECD, Global Forum on Digital Security for Prosperity, 2021
[63] OECD, Enhancing the Digital Security of Products: A Policy Discussion, 2021
[64] Singapore Ministry of Communications and Information, keeping our digital spaces safe, 2020
[65] Foley Hoag, United Nations Working Group Approves Cybersecurity Report: what is it and what are the Implications?, 2021

The G20 should promote the adoption of risk-based technical and proce-dural security approaches to safeguard critical activities, services, and in-frastructures on a sector-by-sector basis; protection should also be set for consumer-facing technologies, also considering the imperative protection of minors and least skilled users

G20 countries should engage in developing a comprehensive international approach to map national critical infrastructure and essential services, with the goal of assigning them specific priorities in terms of cyber protection. Critical assets and infrastructures should be defined accordingly to their contribution and importance regarding national wealth creation and indi-vidual safety preservation. In this regard, The Network and Information Se-curity (NIS) Directive (EU 2016/1148)[66], which is currently[67] under update by the European Commission, provides a preliminary definition of the criteria to be used to identify critical and essential services at the national level: (i) the entity provides a service which is essential for the maintenance of criti-cal societal/economic activities; (ii) the provision of that service depends on network and information systems; and (iii) a security incident has significant disruptive effects on the provision of the related essential services.

The consequent process of setting up a comprehensive framework would re-quire[68] Governments to:

(i) Identify critical activities working with other public and relevant private stakeholders;
(ii) Provide a list of operators of the identified critical activities;
(iii) Encourage cyclical enterprise risk management assessments to identify the functions that prove essential for operations to run;
(iv) Promote the mapping of the entire "digital ecosystem";
(v) Suggest cyclical digital security risk assessments of critical functions, to determine the level of digital security risk to be reduced, transferred, avoi-ded, and accepted ("risk treatment")

Based on the assessment of the critical activities and associated risks, Gover-nments should establish the adoption of risk-based technical and procedural security approaches on a sector-by-sector basis.
In particular, to ensure cyber protection for every citizen, Governments should set coordinated rules for consumers facing hardware and software's protection, where each layer of the value chain should be accountable for the cybersecurity of its products, services and processes, also taking into consideration the most vulnerable categories such as minors and less-skil-led individuals. Those categories are likely to spend hours connected, lacking a complete set of competences to support their online presence. Especially children are dramatically increasing their daily screen time usage: with local lockdowns and sport and activities restrictions, time spent online for children aged under 12 surged between 50% and 60%, with most of them spending more than 5 hours per day on smartphones and tablets (excluding home schooling time)[69].

The G20 should therefore focus on implementing harmonized cybersecu-rity principles and safety measures for private uses, considering the diffe-rent capabilities of users to understand threats and concerns. Private efforts should focus primarily on common tools such as social networks, e-mails, and e-commerce websites. Spreading of awareness and sharing of good practi-ces could also significantly improve private users' online protection.

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[66] Directive (EU) 2016/1148 of the European Parliament and of the Council of 6 July 2016 concerning measures for a high common level of security of network and information systems across the Union
[67] European Commission, Proposal for directive on measures for high common level of cybersecurity across the Union, 2021
[68] Further guidance on mapping procedures could be found at OECD, Recommendation of the Council on Digital Security of Critical Activities, 2019
[69] Forbes, As Kids' Screen Time Surges During the Pandemic, Here's What Research Suggests, 2020

Policy Action 2.3: Support technological innovation with policies that promote interconnection, interoperability, and the adoption of market-driven, global, open, and voluntary standards and codes of conduct with the aim of fostering usage of cross-domain solutions and data porting

As Digital Transformation accelerates, countries should create policies that not only address issues at domestic level, but also look towards a coherent set of standards for interoperability that can enable companies to operate efficiently in international markets. Countries should promote cross-border business by adopting global standards, especially when voluntary, multi-stakeholder, consensus-based and transparent guidelines exist. We suggest for the G20 to focus on the following vector of action:

The G20 should promote the adoption of common technological standards to foster interoperability and improve companies' innovation potential and consumers' experience, building on the work of international standard-setting bodies and industry consortia in line with WTO's Technical Barriers To Trade

The latest advancements in technology have driven the evolution of manufacturing architectures into integrated networks of automation devices, services, and enterprises. One of the resulting challenges is the increased need for interoperability of different sensors and systems across all the levels of the industrial ecosystem.

Successful implementation of interoperability in smart manufacturing would result in effective communication and error-free data-exchange across technologies and platforms. A significant challenge is harmonizing architectures and systems that are used by machines and software packages[70].

The G20 should therefore promote the development of the industrial internet by supporting the adoption of global standards for technologies, such as 3GPP, to ensure interoperability.

Voluntary consensus-based global standards can be developed starting from already-established and market-driven initiatives including frameworks developed through public-private partnerships convened by recognized international and national institutes of standardization such as the US National Institute of Standards and Technology (NIST) frameworks, Open Platform Communications (OPC) foundation approaches, the International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC) standards, industrial consortium led programs or relevant European standardization organizations.

By fostering collaboration between existing initiatives both from private and public sector, G20 countries should ensure that standardization approaches are based on actual business necessities, avoid creating stricter bureaucracy and are oriented towards facilitating access to technologies. To do so, the G20 should build on the work of international standard-setting bodies and industry consortia, in line with the WTO's TBT[71] Agreement.

Finally, policy makers should continue to ensure technology-neutral regulations. It is crucial to promote market-based competition, where merits of technical performance and the competitiveness of different solutions and network architectures drive market outcomes, and companies maintain the ability to make their own unrestricted investment choices.

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[70] *Interoperability in Smart Manufacturing: Research Challenges, MDPI, 2019*
[71] *World Trade Organization, Technical Barriers to Trade Agreement, 1995*

Recommendation 3 – Support Public and Private Digital Advantage:

Foster Governments' and companies' responsible development and deployment of digital technologies, by leveraging public and private cooperation in R&D, promoting investments and effective use cases sharing

Policy Actions

3.1 Strengthen long-term public involvement to stimulate R&D in new technologies, while ensuring a fruitful cooperation with the private sector and promoting responsible, sustainable, human-centered, and market-driven development

3.2 Facilitate investments in digital technologies (HW, SW) and reorganization processes that enhance companies' and Governments' technological development and cyber protection, by leveraging effective and non-market distorting funding schemes, providing technical advisory services, and stimulating use case sharing, especially for MSMEs

Leading Monitoring KPI - *Owner: G20 Countries*	Baseline	Target
% ICT Investments on GDP *Source: World Bank*	5.2% (2019)	6.5% (2024)

SDG impacted:

Recommendation 3 contributes to the achievement of UN's SDG for the goals 8: Decent Work and Economic growth, 9: Industry Innovation and Infrastructure, 14: Life Below Water, 15: Life on Land, 17: Partnership for the Goals.

Policy Action 3.1, 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". Moreover, fostering advancements in digital technologies and applications such as Big Data, would contribute to target 17.18 calling for an increase in the availability of data for monitoring the SDGs.

Policy Action 3.2, conveying incentives to companies' technology and cybersecurity development efforts, would increase countries' digital advantage acting on targets 8.2, focused on achieving higher levels of productivity through technological innovation.

Policy Action 3.2 would additionally act on targets 9.1 and 9.4, oriented towards building resilient and sustainable infrastructures. 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 aimed at promoting inclusive industrialization. Finally, developing more sustainable digital solutions would further contribute to targets 14.1 and 14.2 aimed at preventing and reducing marine and coastal pollution, also impacting targets 15.1, 15.2, 15.3 and 15.4 oriented towards ensuring land preservation and biodiversity conservation.

G20 Italy Priorities:

Recommendation 3 commits towards the realization of all three pillars of the G20 Italian Presidency, namely People, Prosperity and Planet.
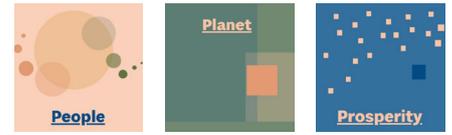
First, Policy Action 3.1 would insist on granting a supportive environment for R&D to flourish, leading to the production of sustainable products and services which will reduce harmful effects on the Planet.

Second, Policy Action 3.2, by increasing public and private entities' technological advantage would lead to higher productivity and efficiency across sectors benefitting Prosperity. Finally, fostering use cases and best practices sharing, it would enable better market inclusivity for MSMEs but also more distributed knowledge across and within industries, leading to the development and industrialization of advanced products and services which will better serve People needs.

Context

New digital technologies such as Artificial Intelligence, Big Data, Internet of Things, Cloud, Edge and Quantum Computing, are rising globally at an unprecedented pace, creating exciting opportunities for services and business models that lead innovation.

The Artificial Intelligence market is expected to grow nearly 8 times from 2017 to 2025, reaching a size of USD 4.5 Tn[72]. A larger adoption of Artificial Intelligence will not be bound to a single sector but will promote efficiency and effectiveness across industries.
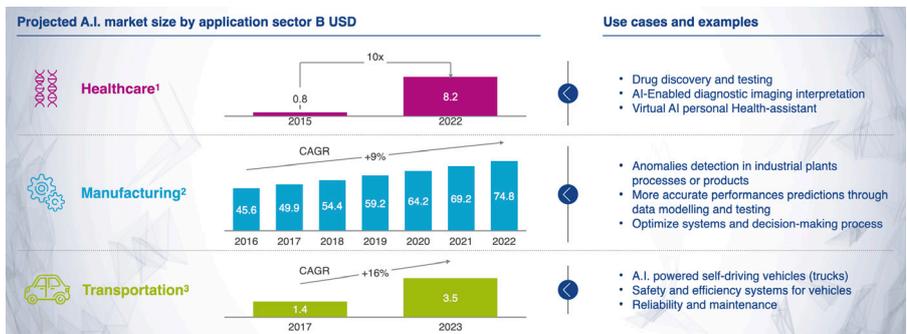
Exhibit 6 | A.I. will enable the development of different use cases across industries (illustrative)

1. Market defined as global revenue for artificial intelligence systems in health care; Frost and Sullivan (6.7 B USD by 2021), Markets and Markets (8 B USD by 2022), Global Market Insights (10 B USD by 2024)
2. Microsoft 2019 Manufacturing Trends Report
3. Prescient and Strategic Intelligence Report "Artificial Intelligence in Transportation Market", March 2018

Source: Gartner; Statista

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[72] Gartner, Statista, 2019

As the collection and analysis of personal and corporate data grows, ethical and trust concerns emerge too. On this regard, regulators have endorsed ethical and trust-orienting AI principles in the past years, as also pointed out in the 2019 G20 Osaka's Leaders' Declaration. The declaration suggests that a responsible development and use of AI can be a driving force to help advance the SDGs and to realize a sustainable and inclusive society. Moreover, the statement commits to human-centered approach to AI and welcomes non-binding G20 AI Principles[73].

Governments are now facing new complex challenges: translating AI principles into clear and actionable regulatory principles, favoring customer protection and data privacy, while preserving innovation and technological advancement, also leveraging on existing national plans, strategies, and roadmaps for AI proposed by the OECD[74].

While the overall objective is clear and shared, as of today there is no common regulatory approach on AI development, and countries are approaching the subject differently.

Exhibit 7 | Countries approach on regulatory principles example: Artificial Intelligence
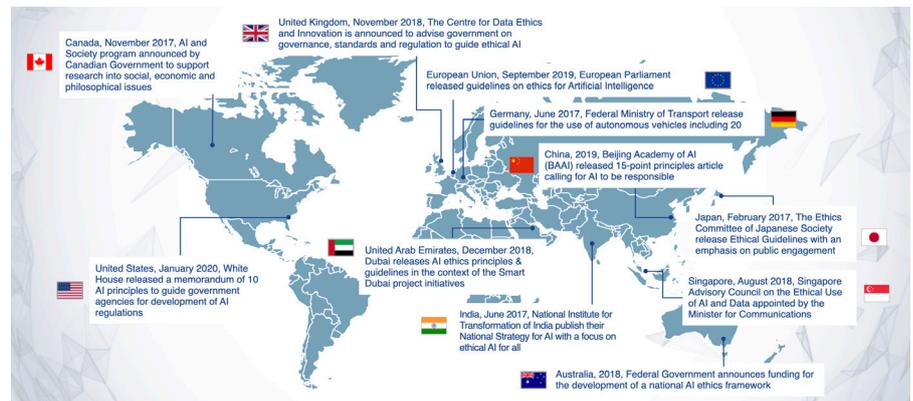
Source: Press Releases 2017-2020

Digital readiness of firms and Public Administrations is not always homogenous between and within countries, markets and competitive fields. Furthermore, many firms struggled to keep pace with global technological advancements even before the pandemic. COVID-19 has only exacerbated the urgency of firms to embrace Digital Transformation in the short-term, and further widened the digital divide.

On the one hand, 75% of executives[76] of large corporations perceive Digital Transformation as more urgent considering the current crisis, with 65% saying they would prioritize their spending on it as a critical response to the pandemic. On the other, in smaller and less international realities such as MSMEs, the situation is different. Companies still lack understanding of and awareness on Digital Transformation's advantages, and thus struggle to effectively deploy emerging technologies. For example, 43% of European SMEs are still unsure about the benefits arising from technological advancements[76].

[73] G20 2019 Japan, G20 Osaka Leaders' Declaration
[74] OECD, Examples of AI National Policies, Report for the G20 Digital Economy Taskforce Saudi Arabia, 2020
[75] BCG, The Evolving State of Digital Transformation, 2020
[76] European Digital SME, European SME survey, 2019

Expected impact of digitalization on SMEs' business
"Digitalization will have a positive impact on our business"

43% not sure about positive impact

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

4%
8%
18%
31%
39%

Perceived barriers to the adoption of new technologies

Share of companies surveyed (%)

Barrier	Value
Skills gaps in the local labour market	55.4
Inability to attract specialized talent	46.7
Skills gaps among organization's leadership	41.4
Insufficient understanding of opportunities	38.9
Lack of flexibility of the regulatory framework	33.0
Shortage of investment capital	32.3
Lack of flexibility in hiring and firing	26.3
Lack of interest among leadership	17.9
Other	5.3

Exhibit 8 | 43% of SMEs surveyed remains unsure on the impact of digital on business
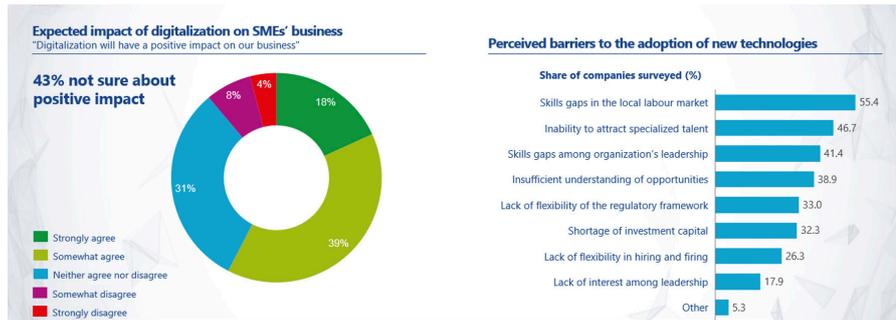
Note: Share of SMEs which disagree or agree with the statement "All in all, digitalization will have a positive impact on our company's business"

Source: European SME survey 2019, conducted on 500 companies by country belonging to France, Germany, Poland, Spain, and United Kingdom having 20-249 employers; Future of Jobs Survey 2020, World Economic Forum

For all companies, regardless of their size, keeping the pace with technological advancements also implies ensuring cyber protection for all of their employees and clients.

Cybercrime is predicted to cost the world USD 6 Tn in 2021, nearly doubling the USD 3 Tn observed in 2015[77]. Companies, especially MSMEs, often lack the necessary skills to keep up with the latest security standards and procedures, risking leaving consumers and value chains unguarded.

The limited availability of cybersecurity resources can also be attributed to the worldwide deficit in cybersecurity competences and skills, resulting in 4 Mn cybersecurity jobs gap in 2019. Data suggests that the global cybersecurity workforce needs to grow 89% to effectively defend organizations' critical assets[78].

Finally, countries are tackling post-COVID-19 recovery plans with different approaches, but the importance of Digital Transformation to face future challenges is widely considered a top priority.

As a reference, The Korean Digital New Deal promotes Digital Transformation with four main objectives: (i) Stronger integration of data, network and Artificial Intelligence throughout the economy; (ii) Digitalization of the education infrastructure; (iii) Enhanced "untact"[79] industry including supporting online activities of micro-businesses and promoting remote working among SMEs; (iv) Digitalization of Social Overhead Capital (SOC) which includes adding digital innovations to urban spaces and building smart logistics and distribution systems[80].

In this context, to assist the G20 in enhancing business resilience and foster technological investments, we recommend the following two policy actions:

• Strengthen long-term public involvement to stimulate R&D in new technologies, while ensuring a fruitful cooperation with the private sector and promoting responsible, sustainable, human-centered, and market-driven development;

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[77]Cybersecurity Ventures, Cybercrime To Cost The World $10.5 Trillion Annually By 2025, 2020
[78]ISC cybersecurity workforce study, 2020
[79]The term describes doing things without direct contact with others, such as using self-service kiosks, shopping online or making contactless payments, BBC, The South Koreans left behind in a contact-free society, 2020
[80]UNDP Seoul Policy Centre for Knowledge Exchange through SDG Partnerships, Korean New Deal for the post-COVID-19 era, 2020

• Facilitate investments in digital technologies (HW, SW) and reorganization processes that enhance companies' and Governments' technological development and cyber protection, by leveraging effective and non-market distorting funding schemes, providing technical advisory services, and stimulating use case sharing, especially for MSMEs.

Policy Action 3.1: Strengthen long-term public involvement to stimulate R&D in new technologies, while ensuring a fruitful cooperation with the private sector and promoting responsible, sustainable, human-centered, and market-driven development

Efforts in R&D are essential to stimulate innovation and represent the foundation to design and develop new products and services. To properly recover from the pandemic, R&D must thrive in the global landscape, but countries still have widely different levels of R&D intensity (intended as the percentage of country GDP allocated to R&D)[81]. Therefore, it appears critical that G20 members drive R&D forward by leveraging two main dimensions:

The G20 should endorse digital R&D efforts and focus on fostering public - private cooperation aimed at promoting business-relevant technological advancements that enhance productivity and add social value

G20 members must develop and / or formalize consistent and effective R&D national agendas with the goal of improving the conditions to innovate in each country. Agendas should include specific targets for R&D intensity, clear policies on how to promote and support private R&D investments (e.g., procurement programs, grants, R&D tax credits), and rigorous accountability and governance mechanisms.

The G20 must focus on increasing countries' R&D intensity by spending higher percentages of GDP in a conscious manner with the aim of funding research, innovation and supporting Digital Transformation. Governments should also guarantee that R&D spending grows equally across all four main institutional sectors, namely business enterprise, government, higher education, and non-profit sector. Globally, over the past five years, only business enterprise recorded a positive trend[82].

Governments should also ensure that R&D efforts effectively translate into tangible impacts, are close to market technologies and contribute to generate market-ready products and services.

To promote a business-driven approach to R&D, G20 members should create platforms, contests, events, to foster public-private cooperation and leverage public-owned competence centers. Governments must also take into account how innovation happens in the modern economy, providing incentives also to facilitate purchases of intangible assets and services such as data sets, data analytics and cloud computing tools.

To further foster innovation, it is important to provide the correct development ground for start-ups and to include them as important actors in the R&D national agendas. Indeed, they cover 20% of the employment across OECD countries[83], and represent a strong catalyst for innovation and new products or services development.

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[81]*The World Bank, Research and development expenditure (% of GDP), 2020*
[82]*Eurostat, Europe Indicators on R&D and Innovation, 2020*
[83]*DynEmp: Measuring Job Creation by Start-ups and young firms, 2020*

The G20 should ensure an ethical and responsible development and deployment of Artificial Intelligence, building on existing national policies and encouraging international cooperation

Regulatory approaches governing the development and use of technologies such as Artificial Intelligence need to be defined in a systematic, risk-based, and methodical way, with contributions from all involved stakeholders.

A structured and data-driven dialogue between industrial sectors and governments would enable coordination and consistency across borders, leading to more attractive outcomes also for consumers. Industry and governments must also work together to effectively communicate the benefits of AI to citizens and businesses, especially MSMEs, to build trust by countering disinformation, and to promote its uptake across sectors.

Therefore, the G20 should focus on finding consensus around AI foundational concepts, management principles, and governance practices, also keeping guidelines flexible to fit a wide variety of contexts without creating unnecessary barriers to trade. Existing efforts in identifying proper guidelines, such as Singaporean Artificial Intelligence Ethics and Governance Body of Knowledge[84], could be taken as inspiration.

On this, the G20 should build on existing international working groups such as the OECD Network of Experts on AI (ONE AI) or UNESCO efforts[85] with the goal of enhancing collaboration practices. AI applications should also not be limited by over-regulated environments and efforts should focus on addressing potential regulatory gaps rather than duplicating existing requirements.

Policy Action 3.2: Facilitate investments in digital technologies (HW, SW) and reorganization processes that enhance companies' and Governments' technological development and cyber protection, by leveraging effective and non-market distorting funding schemes, providing technical advisory services, and stimulating use case sharing, especially for MSMEs

Business resilience has been deemed one of the core priorities after the pandemic outbreak[86]. Resilience also represents a driver for value creation, especially when companies outperform their peers during difficult times and others lose ground or fail. During COVID-19, Digital Transformation has been key to ensure adequate preparedness and cushion shocks[87] highlighting even more the urgency of supporting investments in the digital field. Therefore, we suggest the G20 to act along the following four dimensions:

The G20 should facilitate companies' and governments' Digital Transformation enhancing public - private cooperation and raising awareness on channels / criteria to access public funding, while also facilitating MSMEs digital advancements by exploiting competence centers and innovation hubs advisory

G20 countries should define national strategic roadmaps to support private and public sectors' technology adoption. Interventions should focus on polices aiming at facilitating Digital Transformation investments, also by establishing voucher schemes and easier and favorable access to loans for innovation, and by encouraging the development of innovation-favoring tax policies (especially for MSMEs, which often struggle to innovate due to lower capital availability).

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[84]*Singapore Computer Society, Artificial Intelligence Ethics and Governance Body of Knowledge, 2021*
[85]*UNESCO official Site, Ethics for AI, accessed 2021*
[86]*BCG, The Digital Path to Business Resilience, 2020*
[87]*BCG, How Bionic Companies Translate Digital Maturity into Performance, 2020*

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

However, countries should also offer advisory and consulting services to firms, in particular MSMEs, on digital technologies. In this context, the G20 should promote public - private cooperation, leveraging on existing competence centers and innovation hubs.

A practical example is provided by the Singaporean "SMEs Go Digital program" offering supporting tools to facilitate SMEs' digital transition, including a wide range of initiatives to meet the digitalization needs at different stages of growth and maturity. The Singapore Government also introduced the Chief Technology Officer-as-a-Service initiative to provide SMEs with quick access to a shared pool of skilled digital consultants[88].

The G20 should support businesses in using technical security standards by facilitating investments and promoting cybersecurity-related information sharing, as well as building cybersecurity competences for private and public stakeholders by investing in human capital and promoting ad-hoc education

Cybersecurity concerns are rising, especially for MSMEs[89], and as a result, companies' spending on this area last year grew 2.4% reaching USD 123.8 Bn. Nevertheless, this growth rate is significantly lower compared with the 8.7% growth between 2018 and 2019[90].

As organizations are more connected than ever, any exposure to cyber risk can result in a breach with potential knock-on effects on their entire value chain. Thus, it is critical that the G20 supports companies in their effort to achieve adequate security levels.

The G20 should promote the use of cybersecurity certifications. In this regard, the G20 should strengthen and streamline the voluntary basis of such certification schemes, also leveraging regulatory proposals about mutual recognition among companies and promoting harmonization among countries to guarantee a high level of cybersecurity throughout the entire value chain. Software and hardware manufacturers as well as service providers (both in terms of support and operations) should be subject to the same regulatory requirements, driven by clear incentives to provide end-to-end security to users. This is necessary due to the importance of both software and hardware protection in ensuring high standards of cybersecurity at all stages of the product and service lifecycle.

At the same time, we underline the importance for certification standards to be mutually recognized among countries to avoid unnecessary and duplicative testing requirements. This could be done through the adoption of a common international framework that also allows for a discretionary level of flexibility.

The G20 should work to increase transparency and openness on the elaboration and adoption of cybersecurity schemes and standards for firms, by engaging in a meaningful dialogue with the private sector. Requirements and procedures should be discussed and reviewed with and within the business community, to ensure that critical concerns are covered.

[88]*Infocomm Media Development Authority, SMEs Go Digital program official website, accessed March 2021*
[89]*Enisa European SMEs facing increased cyber threats in changing digital landscape, 2020*
[90]*Gartner, Forecasts Worldwide Security and Risk Management Spending Growth to Slow but Remain Positive in 2020, 2020*

The G20 should also promote cybersecurity to become a priority for organizations by facilitating investments and efforts in the field. Providing appropriate incentives to stakeholders to manage cybersecurity risks and increase market transparency could encourage innovation in risk management practices. In this regard, the G20 could leverage public mechanisms such as investments subsidies, tax incentives, and vouchers.

The G20 should also support efforts to enhance network security by facilitating information sharing for private and public entities. Connecting with similar firms, reading about real episodes, and learning to identify vulnerabilities, would increase global awareness on best practices along the whole spectrum of cybersecurity: prevention, detection, mitigation, and response. This would also foster equality and fair access to knowledge and resources by less capitalized companies – mainly MSMEs – which could encounter greater difficulties in preventing cyberattacks.

However, focusing only on technical aspects is not enough to prevent rising cybercrimes. Indeed, it is essential to ensure appropriate level of cybersecurity skills and risk management capabilities across all levels of society.

To promote the development of cybersecurity capabilities on a global scale, the G20 should facilitate access of firms and individuals to cybersecurity education by developing public training portals, facilitating private-led trainings, and partnering with centers of excellence.

The G20 should also establish working groups on cybersecurity skills such the one within the ENISA initiative[91] which builds a common understanding of cybersecurity roles, competences, and knowledge used by individuals, employers and training providers across the EU Member States[92].

In the business world, especially within SMEs, cybersecurity is not always considered a priority. However, its growing importance requires companies to change their attitude. Therefore, we call on the G20 to increase cybersecurity awareness, leveraging business-oriented information campaigns.

The G20 should endorse the development of digital government tools (e.g., Digital Identities) and services and support their deployment

Private sector is not the only one to face digital disruption, it is fundamental to also focus on the Digital Transformation of Public Administrations.

The pandemic is compelling Governments and societies to turn towards digital technologies to respond to the crisis and, consequently, leverage digital communication channels to provide reliable information on global and national COVID-19 developments.

Digital technologies have not been used only for communication purposes: some Member States recorded an increase in the usage of Public Administration digital services[93] such as digital ID and digital signature.

This pattern unveils the trend towards a digitization of public processes and citizen-government interactions, with positive externalities both in the speed of services and in the reduction of ineffective bureaucracy constraints.

We believe that the G20 should build on this increase in citizens' consumption of digital services to address further challenges and ensure the adoption of advanced digital public services such as Digital Identities for citizens.

The benefits of Digital Identity solutions include[94]: (i) High standards for accuracy and better compliance; (ii) Enhanced security, as obsolete security features are removed; (iii) Better customer experience, through faster turnaround times and fewer interactions.

Digital Identities, while facilitating communications between Public Administrations and citizens for typical activities such as tax monitoring and payment, access to personal medical information, and general interaction with Public Administrations, could also serve as a critical tool to sustain e-government development on sensitive features such as digital voting.

Therefore, we call on the G20 to explore opportunities for extended implementation of this solution, while keeping into consideration the need for such mechanisms to be implemented in a harmonized, mutually recognized framework on a global scale.

The G20 should step up the building of digital government by also speeding up the establishment of public decision-making systems assisted by digital technology. Promoting public data sharing in a safe and open way and improving the capacity for early warning and emergency response, would improve the decision-making process, increase service efficiency, and speed up the development of new technologies and e-government services.

The G20 should encourage the development of open-source platforms to facilitate use cases sharing, also considering the appointment of an international working group responsible for creating a comprehensive and accessible digital use cases library

As already mentioned, even though Digital Transformation is considered a priority for economic and industrial development, many firms, especially small and medium enterprises, have limited awareness and understanding of possible use cases and benefits deriving from technologies implementation.

The G20 should promote use case sharing across firms and industries by providing them collaborative online platforms and fora to share Digital Transformation experiences and best practices.

We encourage the G20 to build on previous efforts. The Science, Technology, and Innovation Policy (STIP) Compass[95], a web-based platform that collects quantitative and qualitative data on national trends in science, technology, and innovation policy, could serve as inspiration. The portal supports the continuous monitoring and analysis of countries' STI policies, facilitates knowledge exchange and can underpin fruitful collaboration across countries and regions.

Another example of valuable resource for knowledge exchange and collaboration is the OECD AI Policy Observatory[96] which provides data and multidisciplinary analysis on AI, including live metrics, living repositories of policy initiatives and deep analysis of policy issues.

In order to grant the provisions of such platforms, the G20 could appoint a specific entity in charge of building and updating a comprehensive and accessible digital use-cases library.

[94]*Refinitiv Database, The benefits of Digital Identity Solutions, 2019*
[95]*OECD Science, Technology, and Innovation Policy Compass, accessible at https://stip.oecd.org/stip.html*
[96]*OECD, AI Policy Observatory available at www.oecd.ai*

Recommendation 4 - Foster a Digital Ready and Inclusive Society:

Address the existing digital skills gap in the private and public sector by mapping current shortages, up/re-skilling individuals, updating education curricula and encouraging a mindful usage of technologies

Policy Actions

4.1 Define national strategies to address digital skills gap in private and public sectors, also ensuring that efforts and investments are channeled towards top priorities to grant new job opportunities in all sectors

4.2 Improve provision of digital skills at schools and universities to promote the creation of a digital-ready workforce, able to harness the power of digital technologies while recognizing the associated risk

Leading Monitoring KPI - *Owner: G20 Countries*	Baseline	Target
% STEM Graduates over Total Graduates *Source: OECD, EUROSTAT*	24% (2018)	30% (2024)

SDG impacted:

Recommendation 4 contributes to the achievement of UN's SDG **4: Quality Education; 8: Decent Work and Economic Growth; 9: Industry Innovation and Infrastructure; and 10: Reduced Inequalities.**

Policy Action 4.1 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. Moreover, Policy Action 4.1 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, 9.1 and 9.5.

Policy Action 4.2 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 oriented towards increasing the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.
Ensuring the creation of a competent digital workforce in the future support the achievement of targets 8.1, 8.2, 9.1, and 9.5. Finally, Policy Action 4.2 calls for the urgency of ensuring equal access to digital and technology trainings to all, covering target 10.2 aimed at empowering and promoting social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status".

G20 Italy Priorities:
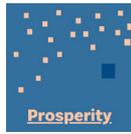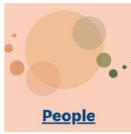
Recommendation 4 builds upon two of the three principles of the G20 Italian Presidency: People and Prosperity.

Policy Actions 4.1 and 4.2 both aim at enhancing opportunities for the development of People on a global scale, by increasing digital readiness of private and public entities, while also promoting fair and inclusive digital education among communities and stakeholders. Moreover, the increased awareness on digital opportunities, amplifying the chance to boost digital offer, fosters growth opportunities and global Prosperity.

Context

Digital skills have become crucial to properly master cutting-edge technologies. As innovative solutions are increasingly adopted among sectors, managing digital tools effectively results vital to fit the current working environment. The ability to connect and engage in digital activities is becoming pivotal for personal life too, given that governments and other public institutions are steadily moving towards digital solutions.

The lack of technical and digital skills – especially at the basic level – could seriously threaten the possibility to engage meaningfully in social activities, raising concerns for social inclusion.

It is thus critical that people, supported by both businesses and governments, act timely to strengthen their digital skills, and benefit from the opportunities generated by Digital Transformation. Nowadays, nearly 60% of workers believe that digital will eventually impact their jobs, and already two out of five employees are affected by skills mismatches[97]. Furthermore, heavy imbalances among countries' digital literacy exist, as also highlighted by the variability of the European Commission's Human Capital and Digital Skills Index[98].

Exhibit 9 | Human Capital and Digital Skills of the Digital Economy & Society Index (2020)
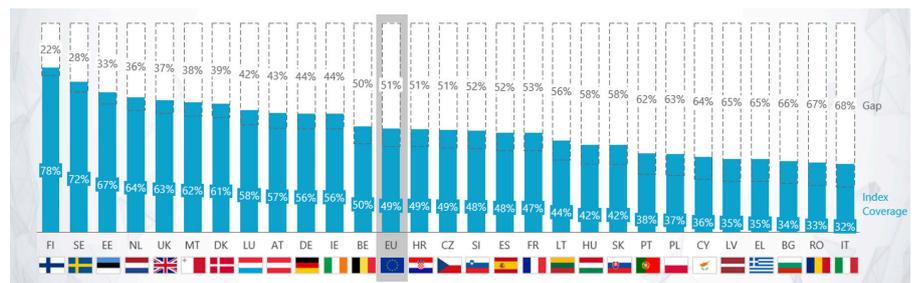
Note: DESI Human Capital Dimension calculated as the weighted average of the two sub-dimensions: 2a Internet User Skills (50%) and 2b Advanced Skills and Development (50%)

Source: Digital Economy and Society Index (DESI) 2020, European Commission

Digital automation, in tandem with the COVID-19 recession, is creating a 'double-disruption' for workers: first, the current shock has increased the adoption of smart working practices (involving up to 44% of the total workforce[99]), 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.

Indeed, 84% of employers are set to rapidly digitalize business processes. However, significant skills gaps currently limit corporate innovation and its benefits.
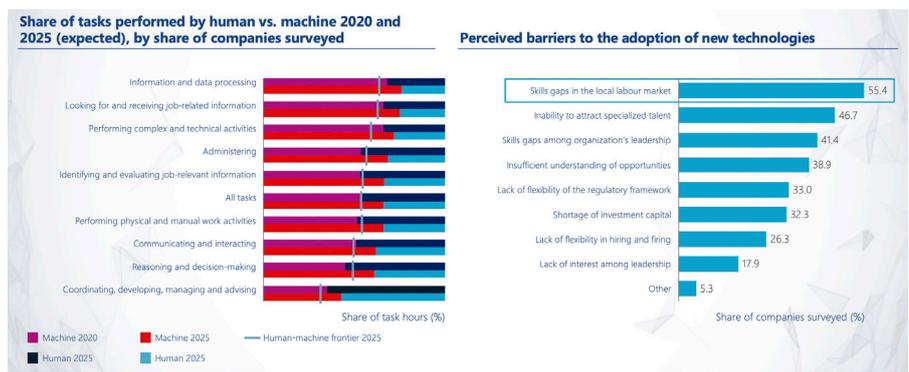
Exhibit 10 | Predicted rising share of automation and skills gaps in local labor market

Source: Future of Jobs Survey 2020, World Economic Forum

The workforce is not the only stakeholder affected, as significant disparities in terms of digital literacy also involve the population at large. For example, 42% of European citizens lack basic digital skills[100]. To create a digital inclusive society, it is important to address the existing gaps between genders and age groups, which have been further widened by the COVID-19 pandemic[101].

Furthermore, rethinking digital education must become a priority for policy makers for two reasons: first, the role of education is a prerequisite for future global competitiveness; 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 soft skills, especially for the youngest. As of today, one third of internet users is a child[102]. Children spend on average more time on the internet browsing social media, playing games, and using mobile apps, frequently without the supervision of adults. Hence, efficient responses are needed to prevent adverse effects on their cognitive, social, and emotional development.

To narrow down the digital skill gap, also to ensure the digital readiness of the future workforce, we propose two main Policy Actions:

• Define national strategies to address digital skills gap in private and public sectors, also ensuring that efforts and investments are channeled towards top priorities to grant new job opportunities in all sectors;

• Improve provision of digital skills at schools and universities to promote the

[99] World Economic Forum, Future of Jobs Report, 2020
[100] European Commission, Digital skills, and jobs coalition, 2021
[101] The Guardian, everything has been pushed back: how Covid-19 is dampening tech's drive for gender parity, 2020
[102] UNICEF, The State of the world's children report, 2019

creation of a digital-ready workforce, able to harness the power of digital technologies while recognizing the associated risk;

Policy Action 4.1: Define national strategies to address digital skills gap in private and public sectors, also ensuring that efforts and investments are channeled towards top priorities to grant new job opportunities in all sectors

The COVID-19 pandemic has further underlined the importance of wide-spread digital capabilities among the whole population. The progressive transformation of industries will require re-skilling and up-skilling to move workers towards new competences and innovative professions. Empowering people with the right set of skills to fit a rapidly changing environment is a shared responsibility of Governments and business.

Although new technologies will change some occupations, they will improve the quality of work by allowing humans to focus more on strategic, value-creating, and personally rewarding tasks[103].

Indeed, Digital Transformation will enable companies to automate non-value-adding tasks. Organizations will need to transform roles and responsibilities to reflect the new working environment.

Breaking down a job into its constituent tasks allows organizations to build a detailed and practical profile for the job role showing the tasks that can be replaced or augmented by technologies[104], and granting the opportunity for their employees to focus on value adding activities.

G20 countries should enhance digital skills of individuals, also focusing on reducing generational and gender gaps to eliminate inequalities and reduce social discrepancies. Prompt action is required along two main vectors:

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, while considering companies, especially MSMEs, digital needs in the post COVID-19 era

G20 countries should promote the adoption of globally shared frameworks to understand and track the current level of digital competences across industries and sectors and should create a common taxonomy on digital skills. Governments should also engage with the private sector to develop a common directory of careers, with the goal of improving the identification of demand - supply mismatches in the digital labor-market, especially for MSMEs. We further call on the G20 to build on existing initiatives, combining regional, national and subnational frameworks such as the World Economic Forum (WEF)'s Global Taxonomy[105], the Occupational Information Network (O*NET) Taxonomy and the ESCO (European Skills, Competences and Occupations) framework.

Fruitful cooperation between Governments and the private sector was also provided during the setup of the Singaporean Tech Skills Accelerator (TeSA): a tripartite initiative by the Government, industry and the National Trades Union Congress (NTUC) to build a skilled workforce and enhance employability of individuals[106].

[103]BCG, The Future of Jobs in the Era of AI, March 2021
[104]A guide to job redesign in the age of AI, Personal Data Protection Commission Singapore, Infocomm Media Development Authority Singapore, Singapore University of Technologies
[105]World Economic Forum (WEF), Building a common framework for Skills at Work: A Global Taxonomy, 2021

When establishing global frameworks, Governments must ensure that taxonomies, instruments, and tools, are equally implementable across different geographies, regardless of political, socio-economic and financial conditions. Once current digital skills gaps are identified, the G20 should build strategies aimed at defining key stakeholders, priorities, action plans and required investments. Even in this context, the G20 could consider existing initiatives such as the ITU Digital Skills Toolkit[107], which provides policymakers with practical information, examples, and step-by-step guidance to develop national digital skills strategies.

The G20 should embrace policies to promote trainings and continuous education to enable the up/re-skilling of individuals, in private and public sector, and ensure that everyone benefits from Digital Transformation, including creating new job opportunities in all sectors, also addressing gender and generational gaps in technology usage / proficiency

G20 members should define national strategies for the development of digital competences, also leveraging the up- and re-skilling of individuals. Strategies should be designed in order to address domestic and international skills gaps and mismatches. Investment plans should be defined consistently, avoiding disparities across countries.
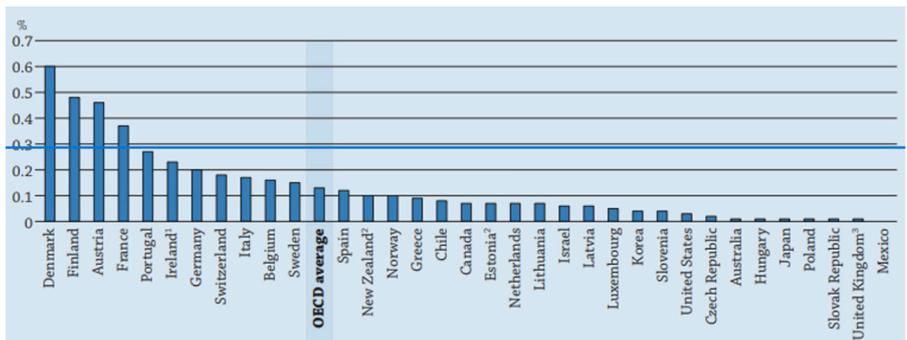
Exhibit 11 | Public expenditure on training programs for active workforce as % of GDP

Source: OECD Libraries, 2015

Moreover, increasing the digital literacy of Public Administrations should be a priority to enable comprehensive e-government systems. The G20 should deploy cross-country public trainings and content-sharing platforms for Public Administrations' employees to facilitate access to digital education, while maintaining a common direction among different countries, also appointing authoritative governance entities to periodically monitor the curricula and effectiveness of those trainings.

In parallel, G20 members should ensure that local Public Administrations have adequate budget to encourage the development of digital skills even in remote municipalities and promote sharing of e-government use cases.

Finally, empowering workers in both private and Public Administration is not enough to solve the digital divide. Addressing also the most marginalized groups - such as the elderly - is of primary importance as well.

To do so, the G20 should promote knowledge diffusion with the aim of helping them to adapt to a digital society by improving their digital skills and literacy, as well as increasing their risk awareness while navigating the cyber space.

Policy Action 4.2: Improve provision of digital skills at schools and universities to promote the creation of a digital-ready workforce, able to harness the power of digital technologies while recognizing the associated risk

Digital technology penetration is growing with 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[108]. 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. Therefore, we suggest to the G20 three areas of intervention:

The G20 should update educational programs to include digital topics in their curricula, considering the skills requirements of the public and private sector, while reducing gender inequalities in technology and digital education The G20 should ensure that school and universities curricula are updated to reflect the needs of the evolving digital age, promoting the development of basic ICT skills and digital competences. A stronger coordination between education systems and the private sector should be encouraged to ensure that school programs are aligned with business necessities and future working opportunities.

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 national level, domestic Education Ministries can play a pivotal role in fostering technological skills. We encourage members to build on existing initiatives and programs, such as the Artificial Intelligence and Robots Competition Series launched by the United Arab Emirates Education Ministry, involving over 3,000 youth annually in national and international robotics, programming and technology competitions[109].

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[110]). Effective digital education action plans should reduce inequalities by developing policies to create equal access to skilling opportunities for all genders, ethnicities, and socioeconomical statuses.

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

We believe that G20 should not only reform educational programs' curricula, but also reshape the way education is provided to students, further boosting their capabilities in interacting with technology. This requires sound polices and investments to boost the role of the technology as a key learning enabler.

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[108]World Economic Forum, Schools of the Future Report, 2019
[109]United Arab Emirates Ministry of Education, National Championship of Series of Artificial Intelligence and Robotics Competitions concludes, 2020
[110]World Economic Forum, Global Gender Gap Report, 2020

In order to achieve this, G20 members should not limit their effort in providing access to software and devices to students, but also promote teachers' trainings on digital tools and learning methods.

In developing comprehensive ICT competency polices for teachers, G20 should leverage on already established frameworks such as UNESCO ICT Competency Framework[111] or The Teaching AI for K-12 working group: a one-stop repository of resources to help curriculum developers and teachers to better understand the promise and implications of Artificial Intelligence[112].

Digitization and enhancement of digital capabilities should not regard tech-related subjects only, but act as a transversal enabler to improve learning experience across subjects. To achieve this, teachers should be engaged in boosting the adoption of technological tools and devices, thus enabling students to progressively gain competences and confidence when dealing with digital tasks and instruments.

The G20 should endorse the development of soft digital skills to create proficient and responsible digital citizens, in particularly children, aware of digital-related risks and able to safely navigate online (e.g., critical thinking to recognize online misinformation, avoid cyberbullying and hate speech)

Digital solutions are spreading across every aspect of our daily lives and social interactions. The digitization of children's skills holds tremendous potential but carries also threats. The OECD[113] identifies different typologies of risk involved for children in the digital environment: (i) Content Risk, (ii) Conduct Risk, (iii) Contact Risk, and (iv) Consumer Risk.

Traditional concerns – such as cyberbullying or exposure to harmful content – have changed in nature but persist. New risks have also recently emerged, such as disinformation or 'fake news' and peer-to-peer uncontrolled interactions. Finally, young users today may face misleading or fraudulent commercial practices and potentially harmful marketing strategies.

Therefore, G20 members should act in close cooperation with educational institutions of all levels, to make sure those challenges are properly addressed. Tailored programs and open courses represent excellent instruments to share knowledge and encourage a conscious and responsible usage of digital tools.

Finally, as global society undergoes Digital Transformation, children protection is of critical importance because, there is a risk that new technologies and approaches are put in place without properly considering the impact on the more vulnerable members of society.

Many countries do not have sections on children's needs and rights in their National Broadband Plans. This increases the chance that public and private entities will create policies, platforms, and services that are not, by design, suitable and safe for children.

It is fundamental that all children are taught digital skills as part of a strategy to minimize the risks and maximize the opportunities of technology.

[111]Unesco, ICT Competency Framework for Teachers, official site, accessed April 2021
[112]Unesco, Ericsson, Teaching Artificial Intelligence for K-12, official site, accessed April 2021
[113] Organization for Economic Co-operation and Development (OECD), Children in the Digital Environment. Revised Typology of Risks, 2021

The teaching of digital skills should be part of the school's core curriculum and should include even soft skills.

To make this possible, the United Nations Broadband Commission for Sustainable Development recommends that leaders from public, private, and civil sectors implement a digital intelligence framework, leveraging also on the ones developed by international think-thanks[114] covering all aspects of the digital environment[115].

[114]DQ Institute, Leading Digital Education, Culture, and Innovation for all, official site, accessed April 2021
[115]UN Broadband Commission, Child Online Safety: Minimizing the risk of violence, Abuse and Exploitation Online, 2019

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

List of Impacted SDG Targets

SDG Target	Description
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
7.3	By 2030, double the global rate of improvement in energy efficiency
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
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 trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all
9.c	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
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.
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
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 Mn people and public and private research and development spending
10.1	By 2030, progressively achieve and sustain income growth of the bottom 40 per cent of the population at a rate higher than the national average
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
13.3	Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning
14.1	By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution
14.2	By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans
15.1	By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements
15.2	By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally
15.3	By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought, and floods, and strive to achieve a land degradation-neutral world

15.4	By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development
16.3	Promote the rule of law at the national and international levels and ensure equal access to justice for all
17.6	Enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge sharing on mutually agreed terms, including through improved coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism
17.8	Fully operationalize the technology bank and science, technology and innovation capacity-building mechanism for least developed countries by 2017 and enhance the use of enabling technology, in particular information and communications technology
17.16	Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries
17.18	By 2020, enhance capacity-building support to developing countries, including for least developed countries and small island developing States, to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts

Schedule of Taskforce Exchanges

#	Date	Event	Location	Theme
1	23/02/2021	TF Videoconference 1	Virtual	Review of 1st Draft Policy Paper
2	23/03/2021	TF Videoconference 2	Virtual	Review of 2nd Draft Policy Paper
3	27/04/2021	TF Videoconference 3	Virtual	Review of 3rd Draft Policy Paper
4	01/06/2021	TF Videoconference 4	Virtual	Review of 4th Draft of Policy Paper
5	06/07/2021	TF Videoconference 5	Virtual	Review of final version of Policy Paper
6	7-8 October, 2021	B20 Summit	Hybrid; Rome	Presentation of TF Policy Paper

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Country	#	Country	#	Country	#	Country	#
Italy	47	France	6	Argentina	2	Netherlands	1
Russia	9	Spain	5	Korea South	2	Poland	1
USA	7	Brazil	4	Singapore	2	Switzerland	1
China	7	Belgium	4	Mexico	2	UAE	1
Saudi Arabia	7	Turkey	3	Australia	1	Hungary	1
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Germany	6	South Africa	3	India	1	Global	1

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