B20 SOUTH AFRICA 2025

Digital Transformation

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Phuthi Mahanyele-Dabengwa
Chair of B20 South Africa Digital Transformation Task Force
Executive Director, Naspers Ltd

Foreword by the Task Force Chair

In every generation, there are moments that demand more than progress — they demand transformation with purpose. This is such a moment. The digital age is no longer a distant promise, it has shaped and will continue to reshape the foundations of our economies, societies, and daily lives. What was once confined to imagination is now coded into reality.

From AI, open digital public infrastructure to fintech platforms, breakthroughs are expanding opportunity and amplifying human potential. Yet the same tools could entrench old inequalities if we fail to act with intention. Our task is clear: keep people at the centre of every algorithm, every policy, every investment.

This is the true essence of digital transformation: the belief that tomorrow can be more just, more inclusive, and more human, not only because of what technology enables, but because of our shared resolve to shape a better future together.

South Africa's G20 Presidency is historic, but it is also meaningfully symbolic. In many ways, it has been a G20 for the continent, amplifying African priorities and perspectives in global conversations. At the same time, it has been a homecoming of nations: a moment of shared reflection and renewed solidarity. This is fitting for a country known as the Cradle of Humankind: the birthplace of our shared human story. From the earliest origins of civilisation to today's global cooperation, South Africa's G20 Presidency reminds us that the future we're building must be one that belongs to all of us, not just the digitally advanced or economically powerful.

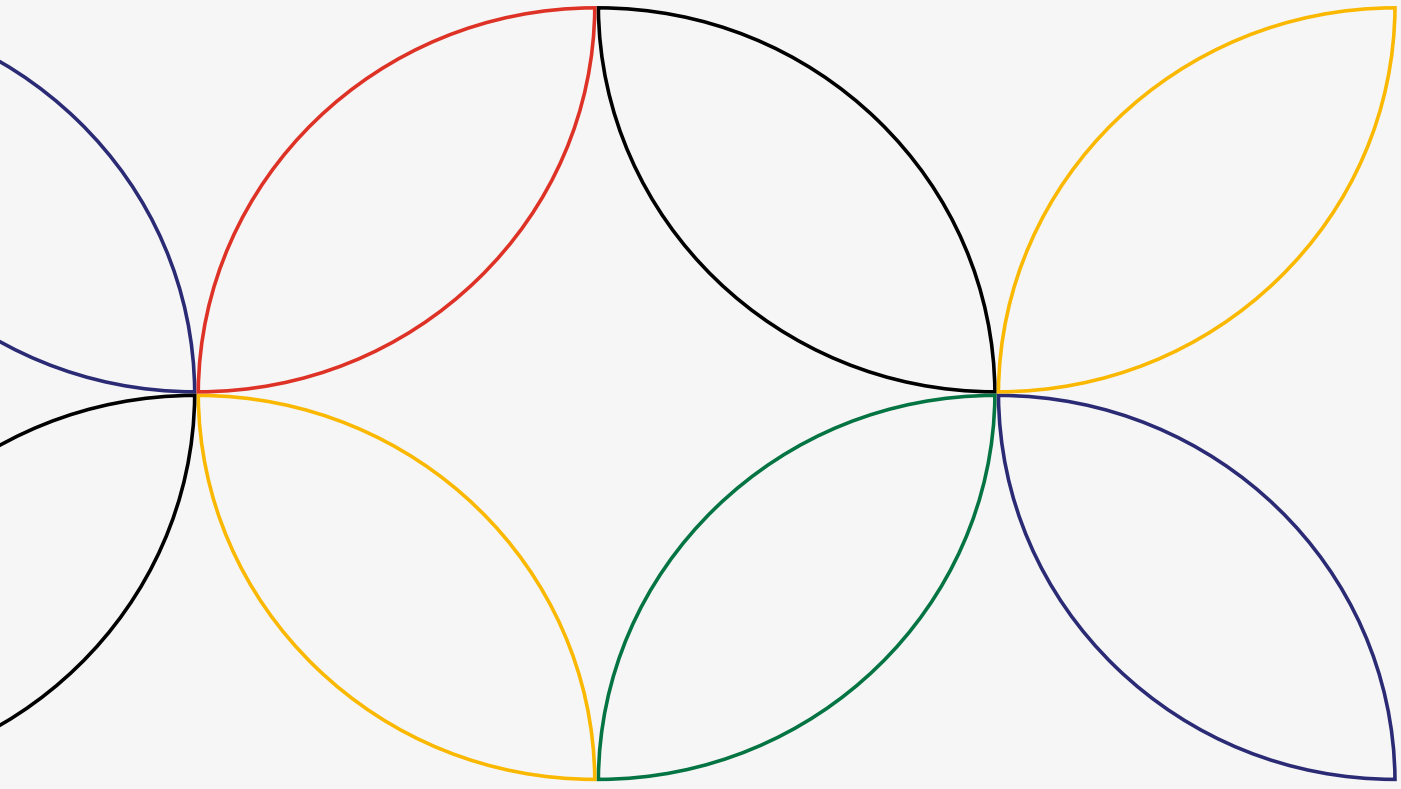
As Chair of this year's B20 Digital Transformation Task Force, I have witnessed the extraordinary commitment of business leaders across the world who recognise that their future, and ours, is intertwined.

Together, we have developed this Recommendation Paper not just as a roadmap, but as a call to action:

- To connect the unconnected, ensuring that no child, entrepreneur, or community is excluded from the digital era.
- To equip citizens with the digital skills they need to thrive, not just survive, in the changing world of work.
- To embed ethical guardrails that ensure technology enhances human well-being rather than diminishing it.
- And, to build people-centred digital public infrastructure that reflects the values of transparency, trust, and interoperability – and delivers tangible benefits such as easier access to public services and greater financial inclusion.

Digital transformation will define the shape of our economies, the character of our societies, and the strength of our democracies. We cannot leave this to chance. It is our responsibility, as business leaders, as policymakers, as citizens, to shape a digital future that is inclusive by design, sustainable in impact, and just in its foundations.

Let us seize this moment not with hesitation, but with ambition. Let us build a future where technology lifts all people, all communities, and all nations.



Bassim Haidar
Deputy Chair of B20 South Africa Digital Transformation Task Force
CEO, BH Holdings

Foreword by the Task Force Deputy Chair

In an era where digital transformation is no longer optional but foundational to economic growth and societal well-being, the responsibility to ensure no one is left behind has never been more urgent. The 2025 Digital Transformation Task has brought together a diverse and dedicated group of global leaders, united in the belief that technology must serve all, not just the connected few. It has been an honour to serve as Deputy Chair in this effort, working alongside partners committed to driving inclusive and lasting impact

Our recommendations do more than diagnose the gaps, they offer a clear path to action: investing in digital infrastructure, equipping people with critical digital skills, and guiding the governance of emerging technologies with ethics and foresight. Each proposal is grounded in the belief that transformation must be inclusive, human-centred, and sustainable.

As we shift from drafting to advocacy, I call upon the G20, business leaders, and civil society to champion these proposals with ambition and resolve. Together, we can ensure that digital progress uplifts all communities, not just the connected few, and that transformation becomes a tool for justice, innovation, and shared prosperity.

Forewords by the Task Force Co-Chairs

Co-Chairs	Forewords
 **Charles Murito** Regional Director, Sub Saharan Africa, Government Affairs and Public Policy, Google	Across the world, a bulging youth population represents a historic opportunity. This ambitious, digitally native generation is poised to become the engine of global growth, but only if we empower them. Their potential to innovate, create prosperous communities and solve generational challenges is the central reason our work is so urgent. The ultimate goal is not just digital transformation, but the human development it enables — translating demographic potential into a more equitable and prosperous society for all. To unlock this future, we must begin with the most foundational step. Therefore, this paper places an urgent and focused spotlight on our first recommendation: to expand inclusive digital infrastructure and deliver affordable and reliable connectivity for all. This is the non-negotiable launchpad for opportunity, providing the lifeline to skills, markets and essential services that allow citizens to thrive in the modern world. This is not a technical challenge alone; it is a policy imperative that demands forward-looking governance. Governments, in partnership with the private sector, must create an enabling environment for this transformation. We need to take deliberate actions; we can build the digital foundations our youth deserve. Let us champion these policies and deploy the infrastructure that will unleash the immense talent of the next generation, allowing our nations and our people to sprint ahead.

Co-Chairs	Forewords

Lord Karan Bilimoria
Chair, ICC UK

The digital transformation of international trade offers an enormous economic opportunity to make trade cheaper, faster, simpler and more secure for everyone, particularly small and medium enterprises (SMEs) and emerging economies that are disproportionately impacted by existing barriers. It is an opportunity to unlock growth, reduce costs and risks, and enable greater resilience and agility in an unpredictable world.

Establishing public digital infrastructure is key to building trust in the trading system and delivering a wealth of economic benefits. Data-driven systems are also key to delivering greater transparency across global supply chains and enabling us to make better, more informed decisions on meeting our long-term sustainability commitments. It is also a vital stepping stone to enabling powerful new technologies, such as AI, to scale across global supply chains and trade corridors. We cannot use technologies like artificial intelligence (AI) to their full potential if the data they rely on is inconsistent and of poor quality.

The Task Force's recommendations include the three central building blocks to trading digitally: removing legal barriers to trade digitalisation, support for trade data harmonisation and the promotion of digital identities for cross-border trade. All three are essential if we are to transition to a data-driven trading system, improve access to finance and make trade cheaper, faster, simpler and more secure for everyone.

Co-Chairs	Forewords

Kate Purchase
Senior Director
International AI
Governance,
Microsoft

The South African Presidency of the G20 has an enormous opportunity to unlock truly transformative change for our society, but that vision remains out of reach as too many people globally are left behind in this rapid digital transformation.

Time and again, history has shown us that with general-purpose technologies, it's not just about who invents first — it's about who puts that innovation to work at scale. This can only come from a forward-thinking, holistic approach to scaling and supporting that innovation, in partnership with governments, industry and civil society.

If we want to see AI drive long-term economic value, it must be accessible — not just in major cities or large corporations, but across regions, industries and communities. That means building the infrastructure to support it, preparing the workforce to use it and shaping the policies that encourage responsible deployment. And, in an increasingly fragmented world, we must see greater alignment on how we build trust and diffuse AI globally.

The report of the B20 South Africa Digital Transformation Task Force tackles the critical issues policymakers and business leaders need to consider to fully seize this enormous potential and grow together.

Co-Chairs	Forewords

Lauren Dreyer
VP Business Operations, Starlink

When the *Co-Chairs* of this B20 South Africa Digital Transformation Task Force first convened, we were united in our desire to drive actions with our contributions.

Ubiquitous access to great connectivity is within reach, yet too many remain disconnected. Satellite networks now cover every corner of the globe, mobile networks enhance coverage and speed daily, and innovative applications offer exciting potential. What stands between promise and progress isn't technology, but the speed of approval.

We're at a pivotal moment where government decisions to embrace technologies will determine who benefits from this digital revolution. The countries that will lead tomorrow's digital economy are those acting decisively today. To this end, I urge decision makers to embrace iterative approaches, capture early wins and build momentum.

Digital transformation, like solving an intricate puzzle, demands multiple workstreams and collaboration; the vital first step is for governments to seize the tools at hand and act with urgency to unlock human potential.

Co-Chairs	Forewords

Ling Hai
President, Asia Pacific, Europe, Middle East and Africa, Mastercard

As we stand at the crossroads of technological evolution and inclusive growth, the B20 South Africa Digital Transformation Task Force offers a vital platform to shape a digital future that works for everyone. Our ambition must be to ensure digital transformation is not only innovative, but also inclusive, sustainable and governed with integrity. But it can't just be about ambition — it must also be about action and impact.

Small businesses are the lifeblood of global economies. Enabling their participation in the digital economy — through access to tools, skills and infrastructure — is essential to unlocking inclusive prosperity. Yet access alone is not enough. Inclusion requires solutions that are relevant, affordable and designed to solve real problems for underserved businesses and citizens. This demands active private sector engagement and investment to deliver scalable, sustainable impact.

Equally, the rapid pace of emerging technologies calls for consistent, forward-looking governance. We must establish global standards that uphold transparency, protect privacy and foster trust. Digital public infrastructure (DPI) should be built on principles that safeguard rights and enable innovation — supported by frameworks that incentivise private sector participation and ensure DPI ecosystems are secure, inclusive and commercially viable.

Alongside this, cybersecurity is central to building trust. As digital systems become more embedded in our lives, they must be secure, resilient and responsive to evolving threats. Public-private collaboration is essential — no single actor can meet these challenges alone.

Finally, we should remain vigilant to the unintended consequences of digital progress. Ethical foresight, inclusive policymaking and cross-sector dialogue will be key to navigating this complexity.

Let us seize this moment to shape a digital transformation that is not only future-proofed, but just, inclusive and centred on the communities that matter most.

Co-Chairs	Forewords

Sir Mohamed Mansour
Chair, Mansour Group

Ever since I was transfixed by a speaker at an event many years ago who gazed into a metaphorical crystal ball and told those of us in the audience that one day patients would be assessed not by a human doctor but by a computer, I have been drawn to technologies that seek to change the world and bring social and economic good.

From being among the first entrepreneurs from the Middle East and Africa to realise the potential of social media to, more recently, recognising the opportunity that AI provides, my investment team and I have scoured the globe for technologies that promise to transform societies and create opportunities for underserved communities.

It is why some of the tech companies we invest in, and are so enthusiastic about, are developing AI tools for educators in Africa, such as South Africa's Mindjoy. With the right strategy, AI is the biggest lever that Africa can pull to close the gap with advanced economies and accelerate access to education, healthcare and economic inclusion across the continent.

There are many challenges, of course, and none of this is easy. Greater levels of funding from big institutions like pensions, endowments and sovereign wealth funds will need to be deployed in privately held start-ups across the continent for Africa to seize this opportunity.

We also must teach the next generation to use AI and other transformative technologies. This is a once-in-a-generation opportunity for Africa, which will take ambitious public and private sector partnerships to realise. We can do it, but we need to work together, and we need to start the work now.

Co-Chairs	Forewords

Shalini Khemka CBE
Founder and CEO, E2Exchange

Digital transformation is not just a global imperative; it is a moral one. It holds the power to drive inclusive growth, encourage innovation and unlock opportunities for billions. Yet, we cannot ignore the stark reality: more than 2.6 billion people around the world remain disconnected from the digital economy. These individuals are excluded not just from technology, but from access to education, healthcare, financial tools and the ability to participate meaningfully in today's economy.

Throughout my career as an investor, entrepreneur and founder of E2Exchange, I've witnessed how digital access can accelerate progress. But I've also seen the systemic barriers that stand in the way. The cost of digital exclusion is personal and it's growing.

We need to stop thinking of digital transformation as a purely technological challenge. It is a leadership challenge. A cultural challenge. One that demands strategic coordination across governments, business and civil society.

That includes universal connectivity, but also equipping individuals with digital skills, fostering inclusive AI governance and building public digital infrastructure that reaches every corner of society. We must pay particular attention to women, youth and marginalised communities, not as an afterthought, but as a central part of the strategy.

I am proud to have worked alongside such a distinguished and forward-thinking group of leaders on this Task Force. The road ahead requires commitment, collaboration and courage. But if we take this seriously, if we lead with purpose, we can build a future where digital transformation doesn't just serve the few but empowers the many.

The opportunity is in front of us. Let's rise to meet it.

Segun Ogunsanya
Chair, Airtel Foundation

Democratising access to digital technologies is an imperative for inclusive growth. Connecting individuals, families and businesses to opportunities in a digital world where access is universal and safe will accelerate prosperity for all. I believe that digital technologies including AI will unlock growth potentials and reveal riches in hidden places for all.

Governments, businesses and civil societies must come together to create platforms which will deepen the adoption of digital technologies by everyone, everywhere — responsibly. We must accelerate the benefits of AI in an equitable manner and within universally acceptable boundaries to safeguard ethical adoption of this transformational tool.

Co-Chairs	Forewords

Shameel Joosub
Group CEO,
Vodacom

Embedded in Vodacom Group's DNA is our purpose of connecting for a better future through empowering people and protecting the planet. Empowering people means being deeply committed to closing the digital divide, empowering our over 211 million customers on the continent and supporting our communities. We achieve these goals by providing affordable connectivity, devices and platforms (including platforms for financial inclusion), supporting SMEs and digitalising other large organisations, critical sectors and government.

Vodacom is committed to implementing these innovations, ethically and responsibly, taking various factors into account, including country specific economic, social, consumer protection, and human rights and laws. What is fundamental in achieving these goals, is enabling policy and regulatory environments, private-public partnerships, extensive AI research and development, as well as skills development.

We are doing our part to enhance our customer's lives and assist governments in fulfilling their goals for digitisation and financial inclusion. Digitisation for us must be meaningful and, therefore, materialise through connecting and empowering women, enabling education, ensuring people with disabilities and people experiencing abuse do not continue to be marginalised, advancing food security and supporting emergency response and healthcare. We have deployed a number of platforms and solutions under our Tech For Good platform to assist in providing solutions.

This is what we are continuously working towards for our communities.

Co-Chairs	Forewords

Smriti Irani
Chair, AGG-GEE

As the digital economy accelerates, the velocity of technological innovation is outpacing our capacity to secure, skill and structure inclusive participation. Without adequate infrastructure and equitable access, the promise of digital transformation risks becoming a privilege rather than a right.

The B20 South Africa Digital Transformation Task Force emphasises the need to expand access, reduce systemic barriers and ensure benefits reach everyone. Therefore, building a resilient and inclusive DPI is a strategic priority.

I strongly endorse the development of a shared reference architecture for DPI — a guiding blueprint that aligns technical standards, governance principles and implementation frameworks across geographies. Such an architecture is foundational to avoiding fragmentation, enabling interoperability and fostering global trust in digital systems.

Achieving this requires more than digital deployment — it demands digital empowerment. Access, literacy and technology must be delivered as basic enablers of citizenship and commerce. As chair of the Alliance for Global Good — Gender Equity and Equality, I have consistently championed this recommendation. Drawing from India's pioneering DPI stack and global exemplars from Brazil to Africa, we have made the case for "Commerce with Care" — a model where economic growth is powered by inclusive technology.

Policymakers, industry leaders and development partners must collaborate to institutionalise this reference architecture, fostering systems that promote innovation, trust and serve all citizens. Let us act with clarity and conviction to shape a digital future where public infrastructure empowers every individual, community and economy to thrive.

Recommendations: Executive summary

Recommendation 1: Expand inclusive modern digital infrastructure and connectivity to deliver affordable and reliable access to digital services, particularly in underserved regions

- **Action 1.1:** Deploy high-speed internet infrastructure to connect unserved and underserved areas.
- **Action 1.2:** Boost internet access in rural and low-income communities by supporting localised connectivity initiatives.
- **Action 1.3:** Scale access to connected mobile devices to enable full use of digital platforms in education, employment, healthcare, commerce and public services.

Recommendation 2: Strengthen national digital literacy systems to equip the workforce with foundational and advanced capabilities aligned with future-oriented labour market demands

- **Action 2.1:** Ensure universal basic digital literacy by prioritising digital education, training programmes, and inclusive learning resources.
- **Action 2.2:** Synchronise tertiary education with industry demands to prepare the workforce for digital and AI-enabled jobs.

Recommendation 3: Advance secure, trustworthy, inclusive and human-centric AI grounded in ethical standards, regulatory clarity and transparent practices

- **Action 3.1:** Align countries to a coherent and accountable AI governance framework as a shared basis for ethical development and regulation of AI.

Recommendation 4: Promote secure and inclusive digital public infrastructure (DPI) ecosystems that incentivise private sector innovation and investment

- **Action 4.1:** Support the development of frameworks to guide countries in designing and implementing people-centred DPI.

Introduction

In every corner of the globe, digital technology is reshaping how people live, work and interact. From AI and automation to high-speed connectivity, the pace of change brings immense promise for economic growth and social progress. Yet, alongside these opportunities comes an urgent imperative: to ensure that this digital transformation is equitable, sustainable and ethically governed on a global scale. The decisions made today will reverberate across societies, determining whether the digital age empowers all nations and communities or deepens existing divides. This South African Presidency of the G20 presents the perfect time to act — to build on the existing momentum from the previous G20s and steer the technological revolution in a direction that expands access to opportunity, safeguards human rights and dignity, and ensures that no country or community is left behind in the digital future.

The promise of digital transformation is unprecedented. Advanced technologies are boosting productivity and unlocking new avenues for innovation, with the World Economic Forum's (WEF) "Future of Jobs Report" projecting that AI alone could add USD 4.4 trillion to the global economy annually.[1] Automation and data-driven systems are helping industries become more efficient. Small enterprises and start-ups, when equipped with digital tools, can access global markets and compete alongside larger firms, spurring inclusive economic opportunity. Micro, small and medium-sized enterprises (MSMEs) are poised to be engines of job creation and innovation in a digital economy, if they can obtain the necessary skills, financing and online access. Digital platforms and fintech services are connecting entrepreneurs to customers and capital in ways unimaginable a decade ago. From telemedicine in rural areas to e-commerce for cottage industries, technology is creating pathways to prosperity for those who can get online. Importantly, productivity gains from digitisation are not limited to advanced economies; they offer emerging markets and developing economies (EMDEs) a chance to leapfrog traditional stages of development and drive growth in a more inclusive manner.

At the same time, the risks and disparities that accompany rapid digitalisation cannot be ignored. According to recent estimates, over 2.6 billion people worldwide remain offline, a gap that represents a vast pool of human potential left untapped.[2] Many low-income communities remain disconnected from the online world that now underpins education, finance and public services. Even where infrastructure exists, people may be excluded by high costs, lack of digital literacy or disability barriers. This inequity not only deprives individuals of opportunities but also hampers overall progress towards sustainable development.

[1] WEF, Technology Tipping Point, 2024.
[2] ITU, Internet Use in Urban Areas, 2024.

Moreover, even for those connected, the benefits of technology can be uneven. Workers with advanced skills or access to capital stand to gain disproportionately, while others face the disruption of automation. Recent analyses estimate that 11 million jobs globally will be created by AI-driven automation, with nine million displaced, hitting some sectors and regions harder than others.[3]

The challenge, then, is to navigate this transition without complacency or alarmism: to retrain and upskill workers for the jobs of the future, to support those displaced and to empower the next generation with digital skills so they can thrive in the evolving landscape. Governments and businesses have a shared responsibility to mitigate the risks — by investing in education, enacting social protections and fostering an economy where the benefits of automation are broadly shared.

When technological change sets new forces in motion, some driving progress and others presenting challenges, it also determines who thrives and who gets left behind. As digital transformation accelerates, it is critical to ensure its potential serves as a bridge — not a barrier — to inclusive economic growth.

However, realising this potential requires a deliberate and collaborative approach, one that brings together the strengths of the public and private sectors. Governments provide the policy direction, public investment and broader environment needed for broad-based progress, while businesses contribute agility, innovation and the technical expertise to scale impactful solutions globally.

With this shared responsibility in mind, we urge G20 members to embrace a coordinated and inclusive strategy for digital transformation, which ensures that no one is left behind. This policy paper outlines four key recommendations to help guide this effort:

a. Achieve universal connectivity by enabling and investing in robust digital infrastructure and fostering partnerships that bridge digital divides

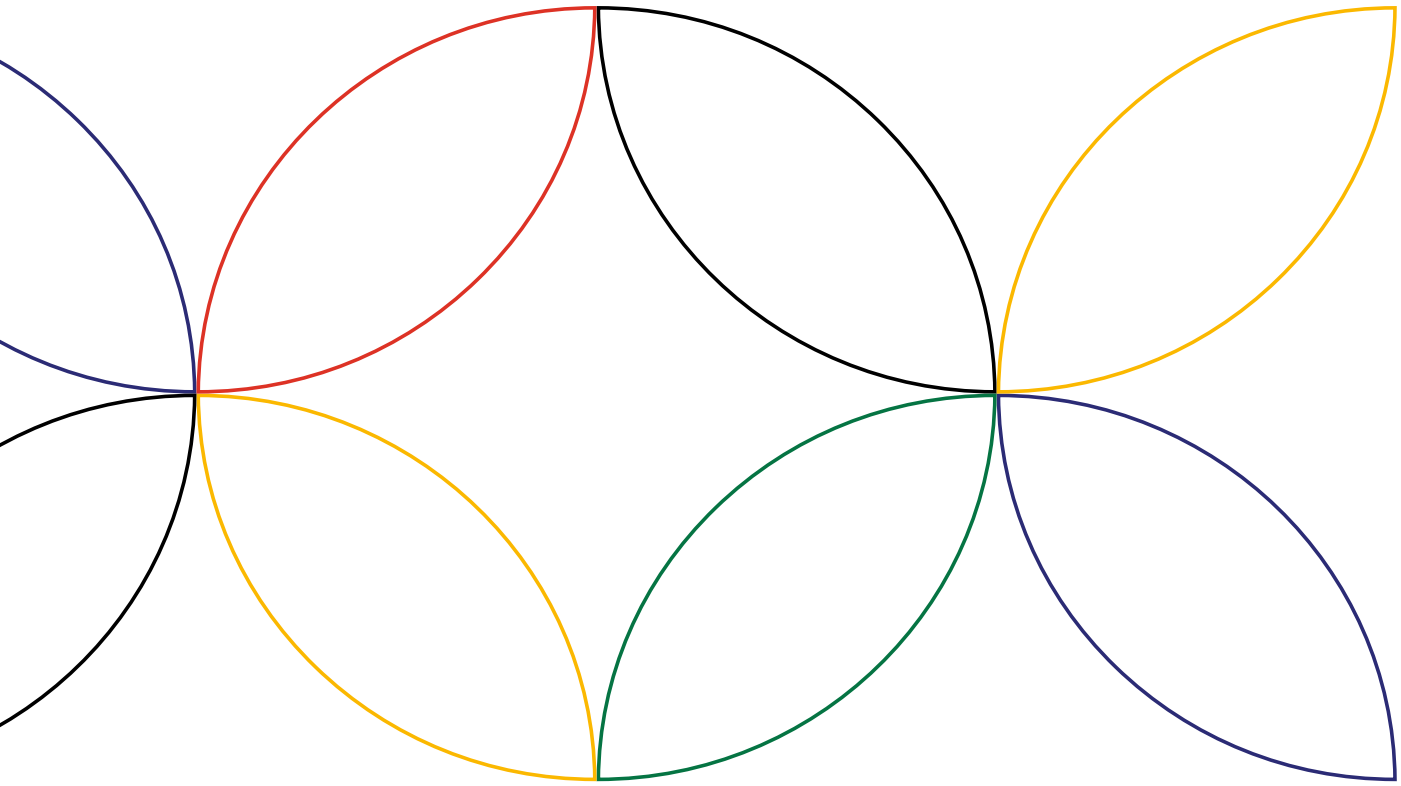
b. Empower citizens with digital skills by embedding digital literacy and lifelong learning into national and international education and workforce strategies, equipping people with the capabilities they need to thrive

c. Channel innovation and transformation through frameworks that promote principles of fairness, transparency and accountability in the development and deployment of digital technologies and systems, while aligning with broader goals of sustainability, equity and human well-being

d. Support people-centred DPI that is secure, inclusive and interoperable, enabling trusted services, responsible private sector participation and equitable access to digital trade

[3] WEF, Future of Jobs Report, 2025.

It is imperative that G20 countries set ambitious targets and rigorously report on progress in achieving these recommendations and approach them as key priorities. To ensure meaningful accountability and sustained momentum, countries should actively engage relevant multilateral organisations, such as the Organisation for Economic Co-operation and Development (OECD), the International Telecommunication Union (ITU) and the World Bank, to design, implement and monitor initiatives aligned with these objectives. Regular reporting and evaluation mechanisms, facilitated by these institutions, will enable transparent tracking of progress, identify areas requiring further action and ensure that digital transformation efforts produce measurable, equitable outcomes globally. Together, through decisive leadership and collective ambition, G20 nations can set the standard for a digitally inclusive future, leaving no one behind.



Recommendation 1

Expand inclusive modern digital infrastructure and connectivity to deliver affordable and reliable access to digital services, particularly in underserved regions

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Actions

Action 1.1: Deploy high-speed internet infrastructure to connect unserved and under-served areas.

Action 1.2: Boost internet access in rural and low-income communities by supporting localised connectivity initiatives.

Action 1.3: Scale access to connected mobile devices to enable full use of digital platforms in education, employment, healthcare, commerce and public services.

Key Performance Indicators (KPIs)

Population not using the internet

- Source: World Bank
- Baseline: 2.6 billion (2024), target: 0 (2030)
- Aligned with previous B20 editions

Fixed broadband affordability for low-income countries (5 gigabytes data as percentage of gross income)

- Source: ITU
- Baseline: 31% (2024), target: 2% (2030)
- New indicator: The B20 South Africa Digital Transformation Task Force has a renewed focus on internet affordability. This KPI provides a more detailed reflection of cost as a key barrier preventing internet usage, which is a key focus of this recommendation, while also incorporating the income-driven dimension of internet affordability.

Percentage of smartphone ownership

- Source: Global System for Mobile Communications Association (GSMA)
- Baseline: 71% (2024), target: 100% (2030)
- New indicator: Increasing device ownership is a novel action, and thus this KPI was introduced to measure meaningful digital participation. The KPI rests on the underlying assumption that meaningful digital inclusion requires affordable access to devices.

Relevant G20 priorities

Recommendation 1 contributes to the priorities of the following groups:

- Engagement groups: Science 20, Startup 20
- Working groups: Development, Digital Economy, and Trade and Investment

Context

Individuals' connectivity

In an increasingly interconnected world, access to digital technology has become vital for economic growth, education, employment and social engagement. However, significant disparities, known as digital divides, persist, leaving approximately 2.6 billion people worldwide offline.[4] These digital divides manifest along multiple dimensions, including geography, development status, gender, generation and educational attainment, highlighting the complexity and scale of global digital exclusion.

a. Urban-rural divide: According to data from the ITU, global internet penetration stands at 83% in urban areas, whereas internet penetration in rural areas is only at 48%. This highlights significant geographic disparities in connectivity.[5]

b. Development divide: An overwhelming 96% of all individuals who remain offline live in EMDEs, highlighting the persistent global development gap in digital usage.

c. Gender divide: Globally, 70% of men are using the internet, compared with 65% of women. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO), this means there are 244 million more men than women online in 2025.[6]

d. Generation divide: Young people (aged 15 to 24) are more likely to be online, with 79% using the internet, compared to only 66% of the rest of the population globally. This is indicative of a substantial generational gap in digital adoption.[7]

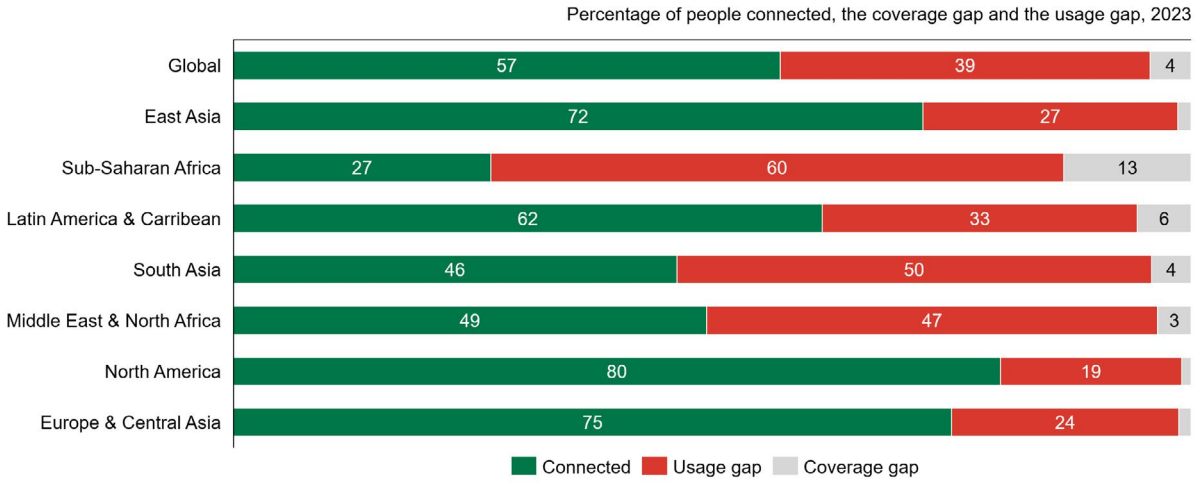
These divides are critical not only because they reflect current inequalities, but also because they indicate where strategic action must be prioritised. First, action must be taken on addressing the coverage gap, where infrastructure and digital services are physically unavailable, affecting around 4% of the global population.[8] Second, the sizable usage gap of around 39%, according to the GSMA (32% according to the ITU), must be addressed. It represents individuals who do not use the internet, despite having the necessary infrastructure and services — affecting countries of all income groups. The magnitude of the usage gap underscores the need for more nuanced interventions that address issues beyond mere infrastructure provision, such as affordability, digital literacy and access to connected devices.

[4] ITU, Facts and Figures, 2024.
[5] ITU, Facts and Figures, 2024.
[6] UNESCO, Closing the Digital Divide for Women and Girls Through Education, 2025.
[7] ITU, Facts and Figures, 2024.
[8] GSMA, The State of Mobile Internet Connectivity Report, 2024.

Moreover, the coverage and usage gaps are often assessed using minimal connectivity standards or thresholds, meaning many counted as "connected" may still have insufficient or outdated internet services. Therefore, achieving genuine digital inclusion goes beyond the headline numbers and demands meaningful and honest representations of the world, both now and in the future.

Exhibit 1: Achieving universal connectivity requires both infrastructure and digital adoption

Expanding network coverage is crucial but insufficient alone — targeted efforts to enhance affordability, digital literacy and access to connected devices must also close the significant usage gap.



Note: The coverage gap refers to the percentage of the population that does not have access to a mobile or fixed network, whereas the usage gap refers to the percentage of the population not using the internet minus the coverage gap; values equal to or less than two are not labelled for spacing purposes. Mobile network coverage is defined as having 3G access, whereas fixed network coverage is defined as having access to download speeds of at least 256kbps.
Source: GSMA, 2024

Human development

Internet connectivity is particularly critical as a keystone enabler of broader human development. The OECD emphasises that unequal access to digital technologies, primarily stemming from a lack of internet connectivity, results in disparities in educational opportunities and outcomes. [9] These disparities perpetuate inequalities from one generation to the next, by not only limiting individuals' educational attainment, but also restricting their ability to access vital services and participate fully in modern society.

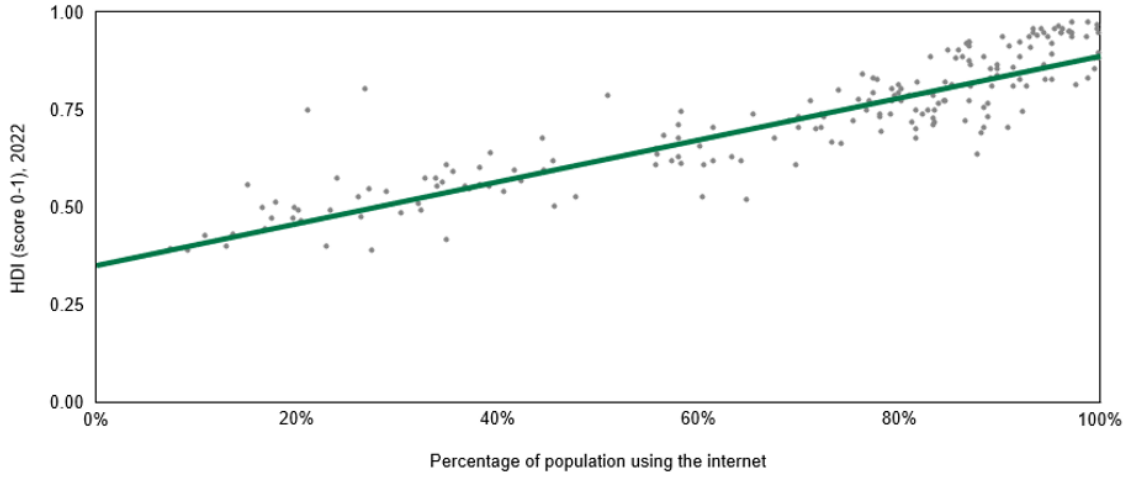
Moreover, internet connectivity influences broader wellbeing and quality of life. A comprehensive global study involving over two million participants found that around 85% of the associations between internet use and psychological well-being were positive and statistically significant.[10] This highlights the internet's role in reducing social isolation and increased access to information and support.

[9] OECD, Digital Divide in Education, 2022.
[10] University of Oxford, Internet Use Statistically Associated With Higher Wellbeing, 2024.

In effect, internet connectivity presents a major opportunity for improving overall human development outcomes. Populations with higher internet usage rates generally report superior human development index outcomes, reflecting better performance in health, education and overall living standards, and confirming the internet's role as a vital driver of inclusive development.

Exhibit 2: Internet connectivity drives greater human development outcomes

Connectivity is essential to inclusive growth, as high rates of internet access strongly correlate with improvements in health, education and overall quality of life.



Note: HDI refers to Human Development Index, which is an aggregate of health, knowledge and living standard indicators.
Source: ITU, 2024

Economic development

The impact of connectivity extends well beyond human development and drives tangible economic development as well. Studies show that even moderate increases in broadband penetration can yield substantial economic returns. The World Bank estimated a 10% increase in broadband penetration could boost gross domestic product (GDP) growth by approximately 1.35% in EMDEs.[11] However, realising this economic potential requires addressing the considerable global gap in digital infrastructure investment, currently estimated at USD 1.6 trillion, with the greatest needs concentrated in developing regions.[12]

At the same time, emerging digital technologies, such as AI and automation, are rapidly changing economic landscapes, but their adoption risks widening existing disparities. Generative AI alone could contribute up to USD 4.4 trillion to global GDP annually.[13] However, most of this economic value will go to countries that are more advanced on the AI development curve.[14] This amplifies the importance of digital infrastructure development to ensure equitable participation in AI's significant economic potential.

[11] World Bank, Exploring the Relationship Between Broadband and Economic Growth, 2016.
[12] ITU, Digital Infrastructure Investment, 2025.
[13] WEF, Technology Tipping Point, 2024.
[14] PwC, Sizing the Price, 2017.

However, realising these economic and developmental opportunities is contingent on overcoming fundamental barriers that currently restrict digital participation. At the heart of these barriers lie persistent gaps in Information and Communications Technology (ICT) infrastructure, disproportionately high costs of internet access and the unaffordability of essential digital devices. Collectively, these challenges severely constrain widespread digital adoption, particularly in low-income regions, further reinforcing existing socioeconomic divides and preventing inclusive growth.[15]

Beyond foundational connectivity, realising the full economic potential of digital transformation, particularly the USD 4.4 trillion annual contribution from AI, requires a strategic approach to the next layer of digital infrastructure: cloud computing. Cloud platforms provide the scalable, secure and cost-effective processing power necessary for governments and businesses to deploy AI systems and data-intensive services without prohibitive upfront capital investment. Therefore, national strategies should consider how to best leverage public, private and hybrid cloud solutions to accelerate innovation, enhance the resilience of digital services and provide the critical underpinning for scaling national DPI ecosystems.

Limited ICT infrastructure

Significant disparities in ICT infrastructure persist globally, driven primarily by inadequate investment in low-income countries and underserved regions. This underinvestment has resulted in substantial differences in broadband quality and availability. By way of example, only 30% of rural populations in low-income countries have basic 4G coverage, underscoring a critical investment need for infrastructure in underserved areas.[16]

According to a study by researchers at George Mason University, the University of Oxford and the International Monetary Fund, achieving universal broadband connectivity for the approximately 2.6 billion people currently offline would require an estimated investment of USD 418 billion.[17] This figure is based on a high-resolution global model that targets providing each user with 40-50 gigabytes of data per month at 95% reliability. Furthermore, the model assumes investments in infrastructure to support predominantly terrestrial 4G deployment, while allowing for satellite connectivity in areas which require remote coverage in very hard-to-serve locations. Most of this investment — 73% — would be needed in emerging market economies, with an additional 24% required in low-income developing countries.

High cost of internet access

Even where basic coverage is in place, widespread adoption of internet services remains severely constrained by high costs. Affordability remains the single most significant barrier to internet use, with 33% of offline individuals globally citing excessive costs as their primary reason for not accessing the internet.[18] Importantly, this is often as a result of low competition in markets, which can significantly contribute to driving down costs.

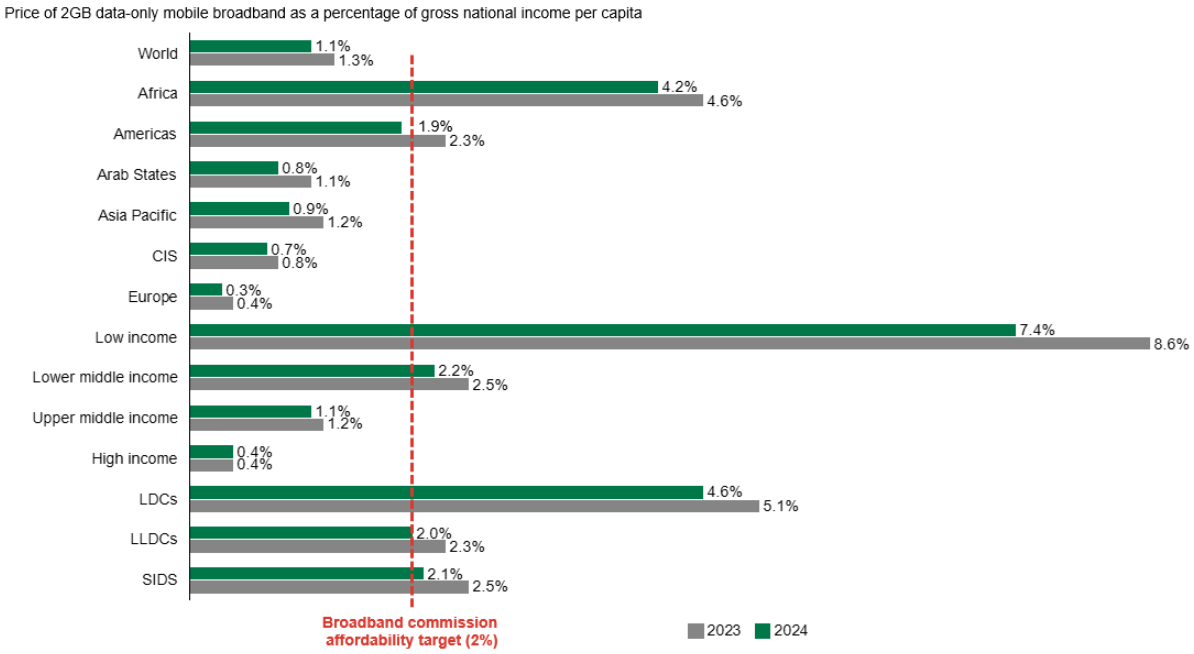
[15] Low-income countries refers to countries classified by the World Bank as having a gross national income per capita of $1,135 or less.
[16] ITU, Facts and Figures, 2024.
[17] Cornell, What Would it Cost to Connect the Unconnected, 2023.
[18] Pew Research Centre, Barriers to Broadband Adoption, 2015.

In many countries, internet costs far exceed established affordability benchmarks. By way of example, individuals in low-income countries would, on average, have to spend around 8.6% of their monthly income on just 2 gigabytes of mobile broadband, significantly higher than the 2% affordability target set by the Broadband Commission.[19]

The problem is particularly pronounced in regions such as Sub-Saharan Africa and Latin America, where digital products and services are disproportionately expensive.[20] This elevated pricing results from a combination of factors, where a major reason is deficient and sparse infrastructure that raises operational costs, which are typically passed on to consumers.

Exhibit 3: Reducing broadband costs is crucial for inclusive digital access

Broadband prices remain unaffordable for many, especially for users residing in low-income countries.

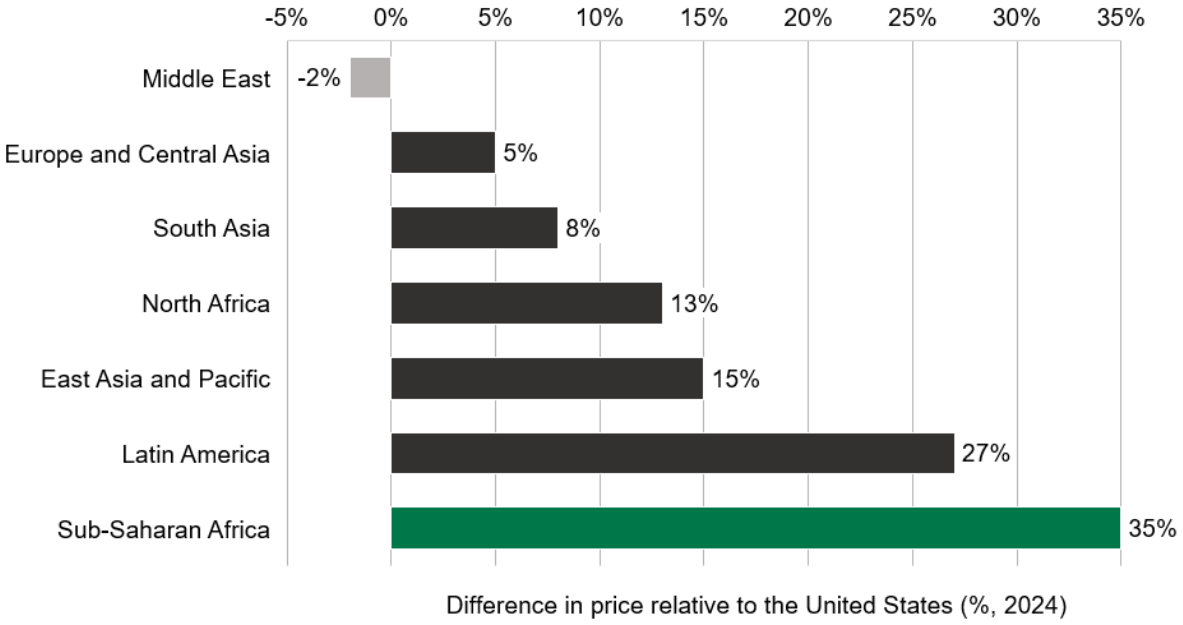


Source: ITU, 2024

[19] ITU, Facts and Figures, 2024.
[20] Sub-Saharan Africa refers to the region of Africa located south of the Sahara Desert, including all African countries except those in North Africa (e.g., Egypt, Libya, Algeria, Tunisia, and Morocco).

Exhibit 4: High regional price disparities limit digital inclusion globally

Various users in G20 countries and beyond face significantly higher costs for digital products compared to the US, underscoring the need to address pricing inequities to promote connectivity.



Source: World Bank, 2024

High cost of devices

In addition to affordable internet access, meaningful digital participation hinges on the availability of cost-effective, connected devices. Yet for billions of people, owning a smartphone, computer or tablet remains a financial impossibility. The affordability gap is stark: for approximately 2.5 billion people worldwide, purchasing even the cheapest smartphone available in their local market would consume over 30% of their monthly income.[21]

On a global scale, the average cost of a smartphone represents about 26% of a person's monthly income. However, this figure masks deep regional disparities. In areas such as South Asia[22] and Sub-Saharan Africa, individuals often face costs exceeding 40% of their income, highlighting the disproportionate burden faced by residents of low-income regions.[23] The situation is even more acute in Least Developed Countries, where the average person would need to spend 53% of their monthly earnings to acquire a smartphone. In low-income countries, this burden can rise to nearly 70%, making device ownership a major barrier to digital inclusion.[24] The situation is further compounded by

[21] A4AI, The Cost of Smartphones Fall But They Remain Unaffordable, 2022.
[22] South Asia refers to the southern region of Asia, including Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka.
[23] A4AI, How Expensive is a Smartphone in Different Countries, 2021.
[24] Least Developed Countries (LDCs) are nations identified by the United Nations as having the lowest levels of income, human development, and economic resilience, based on criteria such as GNI per capita, health and education indicators, and vulnerability to economic and environmental shocks.

regional gender disparities. Women in low- and middle-income countries[25] are 7% less likely to own a mobile phone than their male counterparts.[26] This highlights a persistent digital gender divide that reinforces broader inequities.

These price disparities are primarily because of heightened import taxes, tariffs and regulatory burdens. Consequently, G20 countries have a compelling role in facilitating digital inclusion in this regard.

Businesses' connectivity

The issue of connectivity extends beyond individuals — it impacts businesses, especially smaller enterprises. Just as individuals without reliable digital access face exclusion from essential services and opportunities, MSMEs that lag in digital adoption face significant competitive disadvantages in today's interconnected economy.

Currently, MSMEs are falling behind their larger counterparts in embracing digital technologies. For instance, in the European Union, only 52% of SMEs have adopted at least one digital solution, compared to 75% of large firms.[27] Similar trends can be seen across G20 countries more broadly. Moreover, larger firms are significantly more likely to implement multiple digital technologies. A particularly clear example is cloud computing, where adoption rates starkly differ based on company size: 50% of large firms use cloud services, whereas only 30% of medium firms and just 20% of small firms do so.[28] Further, the gap is widening over time — in 2021, the adoption rate of cloud computing among small firms rose only modestly by 3 percentage points, while the adoption rate among large firms increased from 31 to 33 percentage points, with this trend holding across specific cloud services.[29]

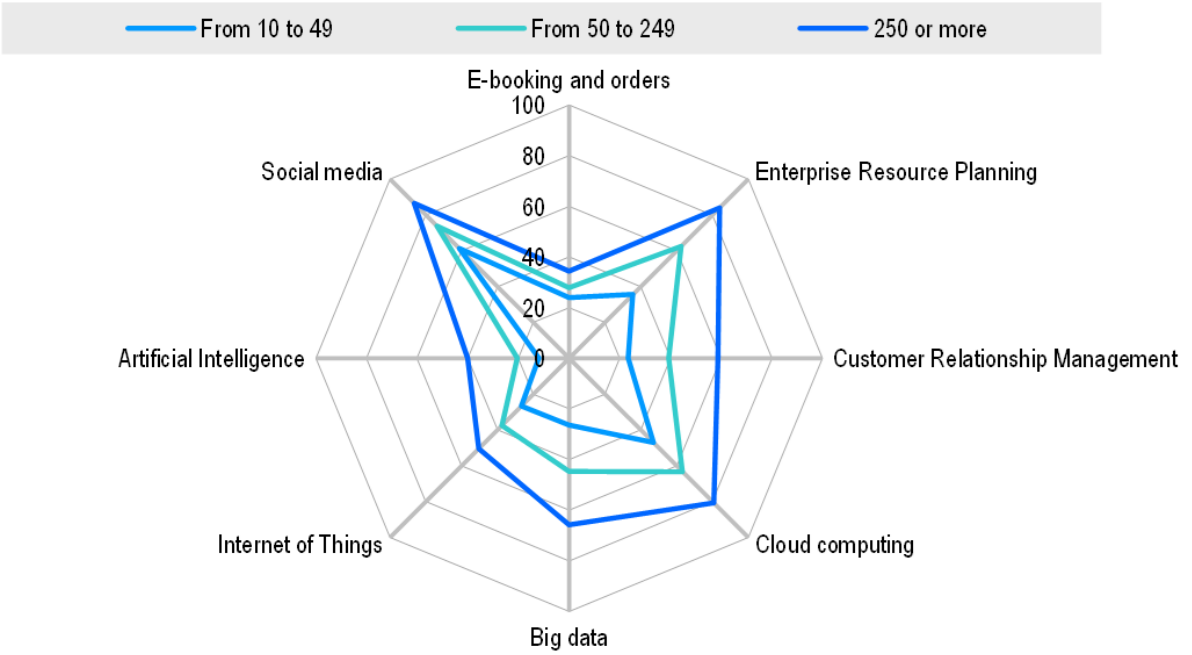
This gap can also be observed in the adoption of more advanced technologies, such as AI. OECD statistics show that the gap in AI adoption between small and large businesses has widened significantly between 2020 and 2024. While the share of small businesses using AI more than doubled — from 5% in 2020 to 12% in 2024 — adoption among large firms also grew substantially, rising from 17% to 40%. Although the relative growth among small firms was strong, the absolute gap in adoption widened from 12 to 28 percentage points.[30] The OECD D4SME Survey collecting data from over 1,000 SME respondents across 10 OECD countries shows that SMEs using generative AI report strong benefits — 91% see productivity gains and over 60% cite innovation and new revenues. In contrast, two-thirds of non-users are unsure how to use the technology or are concerned about risks. While users are generally less worried, major concerns like data privacy and legal issues remain common. These findings highlight the need for clearer guidance and support to help SMEs adopt AI with confidence.[31]

[25] Middle-income countries are nations classified by the World Bank as having a gross national income (GNI) per capita between $1,136 and $13,845.
[26] GSMA, The Mobile Gender Gap Report, 2023.
[27] Institute for Competitiveness, SME Adoption of Digital Technologies, 2021.
[28] OECD, The Digital Transformation of SMEs (OECD Studies on SMEs and Entrepreneurship), 2021.
[29] OECD, SME Digitalisation to Manage Shocks and Transitions: 2024 OECD D4SME Survey (OECD SME and Entrepreneurship Papers), 2024.
[30] OECD, ICT Access and Usage by Businesses, 2024.
[31] M Bianchini and M Lasheras Sancho, SME Digitalisation for Competitiveness: The 2025 OECD D4SME Survey (OECD SME and Entrepreneurship Papers), OECD, 2025.

This gap in digital connectivity places smaller enterprises at a distinct disadvantage. Without robust digital integration, MSMEs find it difficult to engage fully in global markets, access vital capital and compete effectively — creating broader economic implications and reinforcing existing inequalities.[32]

Exhibit 5: Closing the digital adoption gap for SMEs is vital for inclusive growth

SMEs significantly trail larger firms in adopting key digital technologies, underscoring the need for targeted support to boost digital competitiveness.



Source: OECD, 2024

MSMEs, despite being disadvantaged relative to larger firms in digital adoption, are fundamental to the global economy. These businesses constitute around 90% of all companies worldwide, employing more than half of the global workforce and contributing significantly — up to 40% of GDP — in emerging economies.[33] Given their critical role, the slow pace at which MSMEs adopt digital technologies is especially concerning. Because emerging economies rely heavily on these smaller businesses, their slow digital transformation could exacerbate economic inequalities, limiting these countries' participation in the rapidly expanding digital economy.

Connectivity is essential to enable businesses to embrace digital technologies effectively. Over the past decade, the ICT sector in the OECD grew 2.7 times faster than the total economy in the OECD, highlighting a dramatic shift towards digital trade and services. As nearly all businesses now engage digitally in some capacity, connectivity is no longer optional — it is vital for growth, competitiveness and full participation in international markets.[34]

[32] Broadband Commission for Sustainable Development, Making Digital Connectivity Work for MSMEs, 2023.
[33] UN Trade and Development, The International Day of Micro, Small, and Medium Enterprises, 2020.
[34] OECD, Growth of Digital Economy Outperforms Overall Growth Across OECD, 2024.

Several key factors contribute to the digitalisation challenges faced by MSMEs:[35]

a. Knowledge and digital skills: MSMEs often lack the necessary digital knowledge, literacy and technical skills to effectively utilise digital technologies.

b. Relevance: Many MSMEs are simply unaware of how digitalisation can practically improve their business operations and competitiveness.

c. Access: MSMEs frequently struggle with limited access to reliable connectivity and digital services.

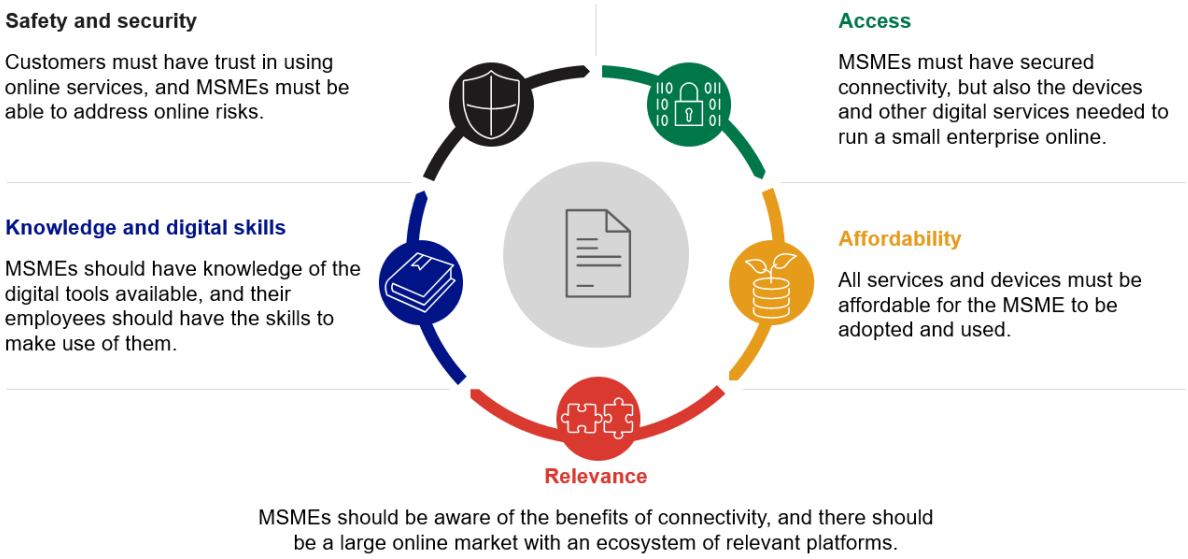
d. Affordability: High costs of digital solutions and services prevent many MSMEs from adopting digital technologies.

e. Safety and security: Concerns about trust, security and safety discourage both MSMEs and their customers from fully engaging in digital transactions.

Together, these issues highlight the need for targeted interventions and supportive infrastructure to help MSMEs catch up in a rapidly digitising global economy.

Exhibit 6: Addressing five key barriers is essential for MSME digital participation

Connectivity for MSMEs requires tackling fundamental barriers — particularly access and affordability — as well as enhancing digital skills, security and awareness of relevant digital solutions.

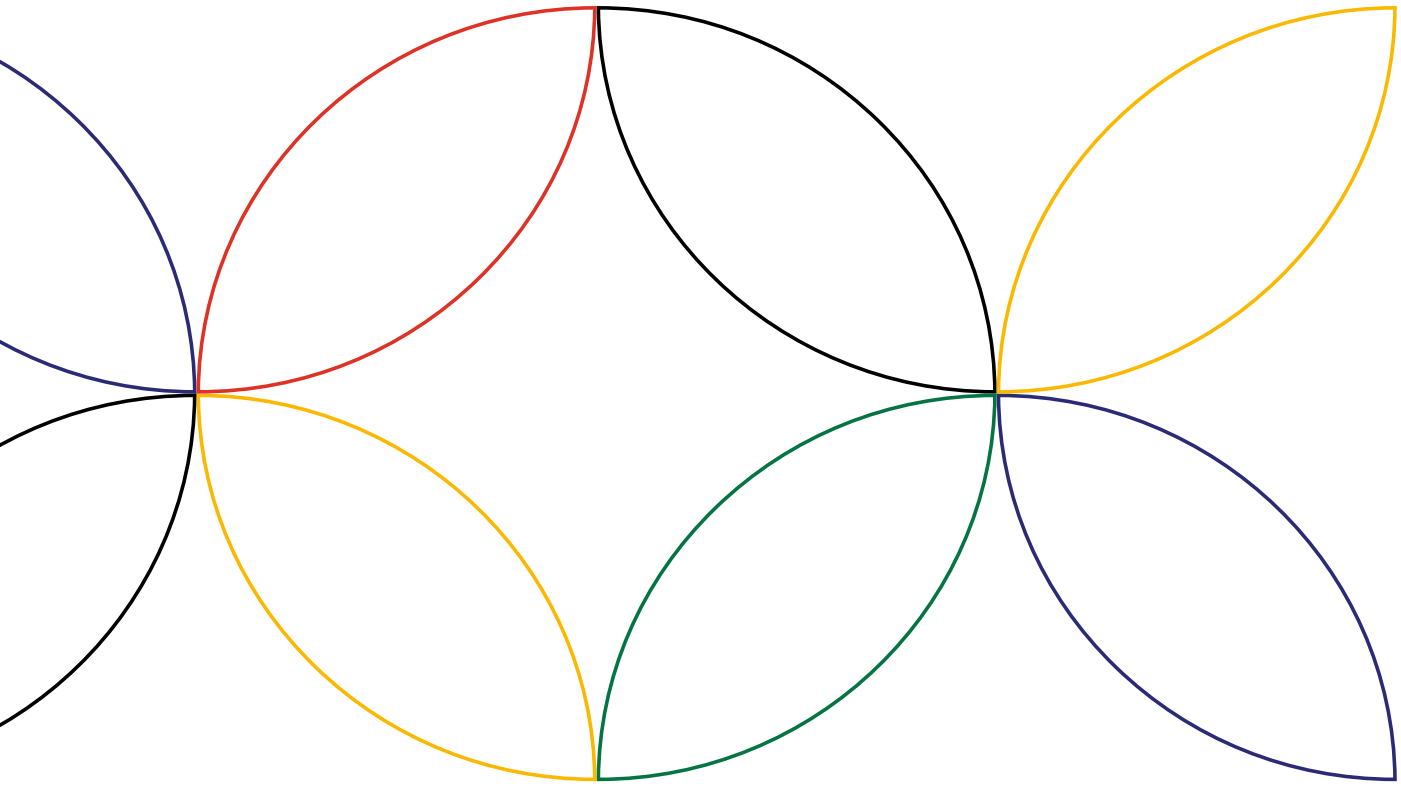


Source: Broadband Commission, 2023

[35] Broadband Commission, Working Group on Connectivity for MSMEs, 2023.

Given the significant challenges individuals and MSMEs face in accessing affordable and reliable connectivity, targeted policy interventions are critical. Action 1 directly addresses these barriers by prioritising investments and initiatives aimed at bridging connectivity gaps. Specifically, this action focuses on deploying robust internet infrastructure (Action 1.1), expanding affordable connectivity through local initiatives (Action 1.2) and ensuring widespread availability of connected mobile devices (Action 1.3). Together, these policies create the foundation necessary for inclusive digital participation, enabling communities and businesses to fully leverage digital opportunities in education, employment, healthcare, commerce and public services.

While many of these issues apply primarily to EMDEs, a lot of them still persist at the individual level — even in advanced economies. As such, while these recommendations apply most pertinently to countries in the Global South, they could also apply to governments across all regions.



Action 1.1

Deploy high-speed internet infrastructure to connect unserved and underserved areas.

Executive summary

To achieve this goal, the G20 is encouraged to:

I. Actively support the expansion of last-mile connectivity through public-private partnerships (PPPs) to ensure internet access reaches all end users, particularly in rural and remote areas

II. Accelerate the transition from older networks to high-speed internet

Background and context

High-speed connectivity is the cornerstone of today's digital landscape. However, for millions, this cornerstone remains underdeveloped. Addressing ICT infrastructure gaps to close the digital divide means extending internet access to reach underserved and remote areas. Furthermore, networks and regulations must be modernised to foster private investment and support the adoption of both current and next-generation technologies.

Addressing the supply-side is a foundational step in greater overall connectivity. Building out high-speed internet empowers communities by enabling greater economic participation, innovation and access to critical digital services. Expanding high-speed internet infrastructure serves as the foundational step towards digital inclusivity, providing individuals and businesses alike with the tools necessary to engage fully in a thriving global digital economy.

The G20 is encouraged to actively support the expansion of last-mile connectivity through PPPs to ensure internet access reaches all end users, particularly in rural and remote areas.

To achieve meaningful progress in connecting underserved populations, the G20 could prioritise and facilitate effective PPPs. These partnerships should clearly outline the roles, responsibilities and incentives for private telecommunications companies to extend connectivity into rural and remote communities. Critical enablers which can be incorporated into financial systems are targeted stimulant mechanisms, such as subsidies, grants, low-interest loans, risk guarantees or special economic zones, explicitly designed to promote investment in connectivity projects in regions that remain underserved.

Additionally, the G20 is encouraged to support the adoption and testing of diverse connectivity solutions. Funding pilot projects and capacity-building initiatives for local technology providers would accelerate the deployment and scaling of innovative and context-specific connectivity technologies. To remove administrative barriers, governments should simplify permitting procedures by establishing transparent, streamlined approval processes with mandated short timelines.

G20 countries could investigate the designation of ICT infrastructure as national priorities to ensure their protection. This would facilitate greater legal penalties for vandalism or sabotage of critical digital infrastructure and mandate the implementation of security protocols to safeguard infrastructure integrity. Ultimately, this will contribute to expansion as well, since a key barrier to further investment in this space relates to the security of holdings.

Moreover, regulatory frameworks should be modernised to actively incentivise infrastructure sharing among telecom operators. Clear regulations outlining infrastructure-sharing rules, pricing models and conditions for access will reduce duplication of investment and lower overall deployment costs. Regions where there is limited precedent on active sharing arrangements, such as Africa, could benefit from the adoption of clear radio access network sharing frameworks that are modelled on existing international best practices. This could include transparent spectrum and licensing guidelines, in cohesion with oversight from competition authorities. Governments are also encouraged to commit to regularly reviewing these regulations to ensure they remain relevant and effective in the context of evolving technological and market conditions.

Lastly, the G20 is encouraged to ensure efficient and affordable access to the radio spectrum — particularly vital for rural connectivity — through transparent and equitable auctions or assignments.

Case study 1.1: Brazil's Acessa Crédito Telecom programme

The "Acessa Crédito Telecom" programme is a strategic initiative launched by the Brazilian government to expand broadband access in underserved and smaller municipalities. The programme entails the provision of funding by Brazil's Telecommunications Services Universalisation Fund to local internet service providers (ISPs) to extend services to areas that are economically unviable, for reasons such as challenging terrain, high infrastructure costs, low population density and the like. This funding takes the form of credit provision and financial guarantees, which allows infrastructure investments to be made in regions that are typically unsuitable, due to the stringent associated credit requirements. The programme specifically targets municipalities with fewer than 30,000 inhabitants and is expected to benefit around 2.5 million people in Brazil.

Importantly, the programme is a prime example of how governments can partner with private sector institutions to improve connectivity outcomes. Targeted subsidisation is a powerful tool to incentivise greater connectivity initiatives in areas where residents have no opportunity to access the internet. Another important principle to be considered from the project is the strong regulatory support that Brazil's telecom regulator, Anatel, provided throughout the process by overseeing implementation and compliance with subsidy criteria.

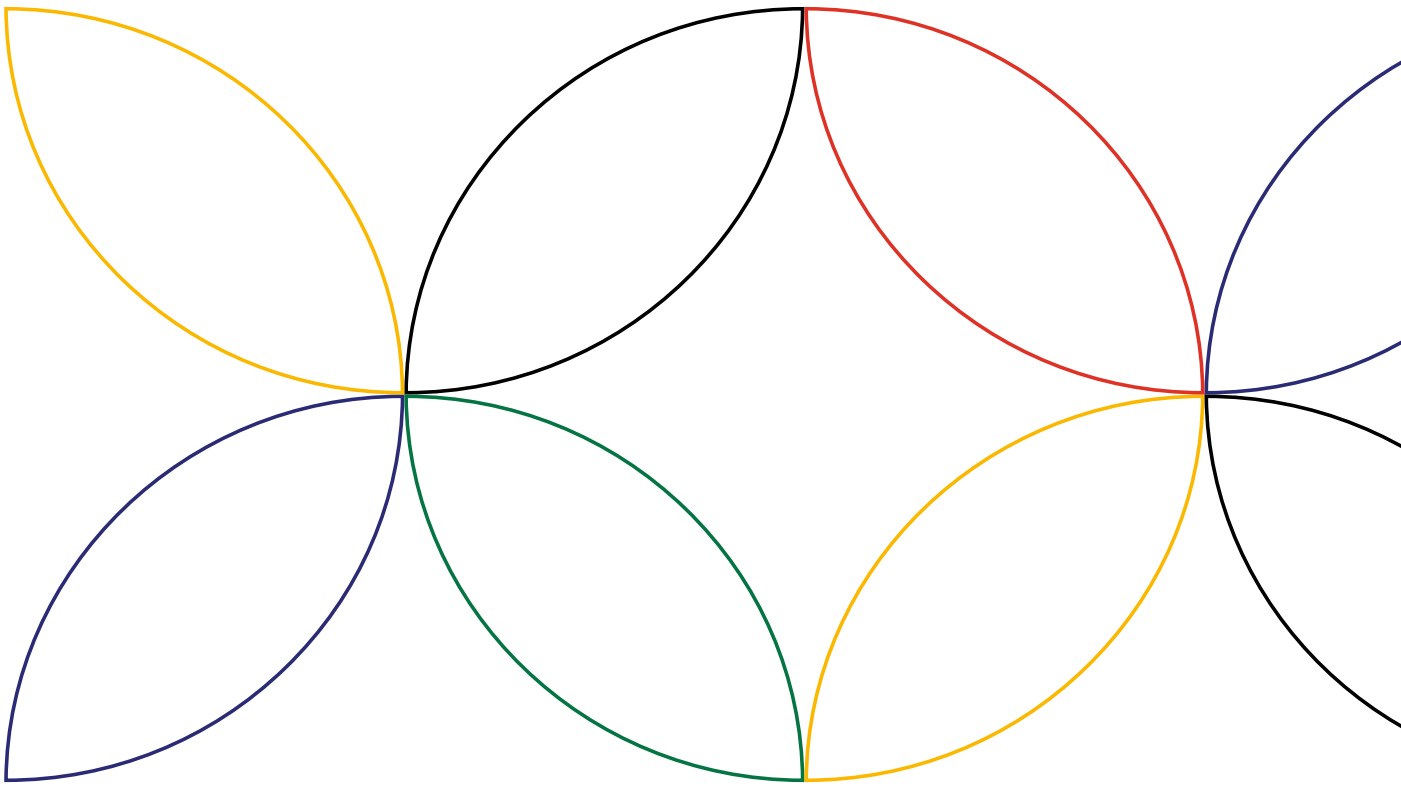
Case study 1.2: South Africa — 2Africa subsea cable for rural connectivity

The 2Africa subsea cable is one of the world's largest undersea internet infrastructure projects. The cable (45,000 kilometres long) will circle the African continent and massively increase international bandwidth, lowering internet costs and improving speed and reliability. In 2023, the 2Africa cable landed in South Africa's Eastern Cape, bringing better 4G/5G and broadband access to underserved rural areas and creating local jobs in data centres and telecom services. This public-private initiative — a consortium of global operators and tech firms — exemplifies how large-scale infrastructure investment can drive digital inclusion.

The G20 is encouraged to accelerate the transition from older networks to high-speed internet.

To successfully transition from legacy networks to high-speed digital infrastructure, a useful step for the G20 is to establish clear regulatory timelines and milestones for telecom providers. Transparent, enforceable schedules are essential to drive accountability, creating clear expectations for telecom operators and promoting timely network upgrades. Defined milestones will allow governments to systematically monitor progress, identify bottlenecks early and intervene proactively to maintain momentum towards universal high-speed connectivity.

Complementing these regulatory frameworks, targeted financial incentives should be provided explicitly to accelerate infrastructure improvements and the expansion of high-speed networks. Instruments such as tax credits, co-investment funds, low-interest loans or risk-sharing mechanisms could significantly reduce financial risks and barriers, encouraging greater private sector participation and investment. Specifically, co-investment models could foster productive collaboration between public entities and telecom providers, pooling resources to deploy infrastructure more efficiently, particularly in underserved regions. These combined regulatory and financial strategies will not only accelerate network deployment but also enhance the attractiveness and sustainability of investment in digital infrastructure, ultimately ensuring broader and more inclusive connectivity across the G20 and beyond.



Action 1.2

Boost internet access in rural and low-income communities by supporting localised connectivity initiatives.

Executive summary

To achieve this goal, the G20 is encouraged to:

I. Support community-driven networks, local ISPs and cooperative models by offering simplified licensing, grants or shared spectrum incentives to major providers

II. Establish free or low-cost internet access points in schools, libraries, post offices, community centres and public Wi-Fi in public transport hubs in under-connected areas as an interim step towards full household connectivity

Background and context

Reliable and affordable internet access remains out of reach for many communities, especially in rural or economically disadvantaged regions. Traditional connectivity solutions provided by large telecom operators often fail to adequately serve these populations due to high costs, geographical barriers and limited financial incentives, leaving many disconnected from essential educational, economic and civic opportunities.

In response, localised connectivity initiatives have emerged as effective alternatives, driven by communities themselves, small-scale providers or cooperative partnerships. These local efforts often better address specific regional needs, ensuring greater adaptability, affordability and sustainability. Supporting these community-centric models through strategic incentives and targeted public access points can significantly accelerate digital inclusion, laying the groundwork for broader socioeconomic empowerment.

The G20 is encouraged to support community-driven networks, local ISPs and cooperative models by offering simplified licensing, grants or shared spectrum incentives to major providers.

To effectively support community-driven connectivity models, the G20 is encouraged to first streamline and simplify licensing procedures. Reducing regulatory complexity will lower barriers to entry and encourage broader participation by smaller entities, fostering competition and innovation at the community level.

In parallel, the provision of targeted grants, subsidies or direct financial support for community-based connectivity initiatives is crucial. These targeted financial instruments can help local operators overcome initial funding challenges, enabling them to scale solutions tailored to regional needs, particularly in remote or underserved areas where commercial incentives are limited.

Furthermore, to remove significant structural obstacles, the G20 is encouraged to allocate dedicated or shared spectrum at reduced costs — or even provide it for free, where feasible — explicitly reserved for local and community-driven projects. By granting affordable spectrum access, community networks and local ISPs can more feasibly establish sustainable and affordable connectivity solutions, ultimately accelerating digital inclusion and socioeconomic development at the local level.

Case study 1.3: South Africa's Zenzeleni Community Networks

Established in 2012, Zenzeleni Community Networks provides internet connectivity to rural communities in Mankosi, located in South Africa's Eastern Cape province. The initiative emerged from a collaboration between local residents and researchers from the University of the Western Cape. It aims to address the lack of affordable telecommunications services in remote rural areas by establishing community-owned cooperatives that build, manage and maintain their network infrastructure.

Since its launch, Zenzeleni has connected over 3,000 individuals, including households, schools, businesses and non-governmental organisations (NGOs). The service is offered at ZAR 25 per month for unlimited Wi-Fi access, significantly lowering the costs of communication for local residents. The network relies on solar-powered technology to ensure reliable service even in areas without electricity.

Zenzeleni has also focused on enhancing digital literacy and building local capacity by offering training workshops for community members. Following this training, engagement with the network increased notably, with approximately 80% of participants continuing to actively use and support the network.

Nationally and internationally recognised, Zenzeleni has received awards highlighting its social impact and innovation. Its community-driven model illustrates how local ownership and management of digital infrastructure can effectively extend internet services to rural and underserved regions.

Government support has played a pivotal role in the development and sustainability of Zenzeleni Community Networks. The South African Department of Science and Innovation, through its agency, the Technology Innovation Agency, provided funding and strategic support to the initiative. This backing facilitated the establishment of solar-powered Wi-Fi networks in underserved rural areas, enabling affordable internet access for communities like Mankosi and Zithulele.

Regulatory support was also crucial. The Independent Communications Authority of South Africa granted Zenzeleni the necessary licences to operate as a community network. This regulatory approval allowed Zenzeleni to function legally and provided a framework for its operations, ensuring compliance with national telecommunications standards.

These collaborations between government departments and regulatory bodies underscore the importance of institutional support.

The G20 is encouraged to establish free or low-cost internet access points in schools, libraries, post offices, community centres and public Wi-Fi at public transport hubs in under-connected areas as an interim step towards full household connectivity.

As a transitional measure towards achieving universal household internet access, the G20 is encouraged to prioritise the establishment of free or low-cost public internet access points in key community locations, such as schools, libraries, post offices and community centres. To support this effort, direct funding or subsidies should be provided to local governments and communities to enable the deployment and ongoing maintenance of these access points. Ensuring the affordability and long-term sustainability of these services will require strategic partnerships with local ISPs or community networks, which can manage and operate the infrastructure effectively.

Innovative access models, such as token-based systems for shared Wi-Fi, should be actively pursued as a means to advance equitable and sustainable connectivity. These models could significantly enhance security, facilitate precise tracking of network usage and enable targeted allocation of bandwidth, ensuring that resources are distributed fairly and managed effectively. By introducing transparent usage limits and promoting responsible consumption, these systems can extend the longevity of shared infrastructure and support broader, long-term digital inclusion.

Case study 1.4: Colombia's Digital Kiosks (Kioscos Vive Digital)

Launched in 2010, Kioscos Vive Digital is a Colombian initiative aiming to provide free or low-cost internet access points in rural and remote communities. Implemented by Colombia's Ministry of Information and Communication Technologies, the initiative was designed to reduce the digital divide by establishing digital kiosks equipped with computers, internet access and trained personnel in underserved areas.

The digital kiosks serve as community access points where residents can engage in online educational programmes, access government services and participate in digital literacy training. Each kiosk typically includes several computers, internet connectivity and offers basic digital training courses tailored to the needs of local populations.

Since its inception, the Kioscos Vive Digital project has established approximately 7,600 digital kiosks across rural Colombia, benefiting around 1.5 million residents. The initiative has enabled greater access to educational resources, facilitated local business opportunities and improved overall digital inclusion. Local community members trained as kiosk managers have also gained employment and skills development opportunities.

The initiative demonstrates how government-led projects can effectively address digital disparities, particularly in rural areas with limited infrastructure. Maintaining consistent internet connectivity has proven challenging due to geographical and infrastructure constraints. Additionally, securing long-term funding remains a critical issue, as sustainable financial support is required to maintain operational stability and growth. Adequately training local personnel is essential for ensuring the kiosks' ongoing functionality and effectiveness, highlighting the necessity of continuous capacity-building efforts.

The involvement of private sector partners, such as British Telecom (BT), has been instrumental in supporting the Kioscos Vive Digital initiative. In particular, BT provided critical network infrastructure services, enabling the reliable delivery of internet access to remote areas and ensuring the kiosks' technical robustness. These public-private collaborations illustrate the value of leveraging corporate expertise to overcome resource limitations and technical challenges.

The Kioscos Vive Digital initiative provides a replicable framework for countries seeking to expand internet access and digital literacy in rural or underserved regions.

Action 1.3

Scale access to connected mobile devices to enable full use of digital platforms in education, employment, healthcare, commerce and public services.

Executive summary

To achieve this goal, the G20 is encouraged to:

I. Improve the affordability of digital devices, ensuring greater accessibility for all populations

II. Provide supporting finance to disadvantaged communities for essential digital devices and services

Background and context

Access to connected digital devices is essential for meaningful participation in today's interconnected society. Despite expanding network coverage, many individuals — particularly from disadvantaged or low-income communities — still face significant barriers due to the high costs of smartphones, tablets and laptops. Without affordable access to these devices, underserved populations cannot fully leverage digital platforms that offer critical services such as education, employment opportunities, healthcare and public resources.

The affordability of devices, particularly internet-enabled handsets, remains the most significant barrier to mobile internet adoption, notably across Sub-Saharan Africa.[36] This device affordability gap perpetuates existing inequalities by preventing entire segments of society, across the globe, from benefiting fully from digital infrastructure investments. By reducing device costs and bolstering second-hand markets, thereby expanding opportunities for regular online connectivity, communities gain improved social mobility, economic participation and overall quality of life.

This Action is particularly important for women's inclusion, since women are 17% less likely than men to own smartphones in low- and middle-income countries. This equates to around 250 million fewer women that own smartphones than men.[37] Scaling access to mobile devices will thus have a disproportionately positive effect on women's inclusion and ability to participate in the digital economy.

The G20 is encouraged to improve the affordability of digital devices, ensuring greater accessibility for all populations.

To effectively bridge the device affordability gap, the G20 could pursue targeted fiscal measures aimed at substantially lowering the retail prices of essential digital devices. Specifically, implementing strategic tax exemptions or reductions, such as significantly reducing or removing import duties and value-added tax (VAT) on entry-level smartphones, computers and essential digital accessories, would directly lower retail costs for consumers. These tax incentives are especially critical for cheaper devices, where eliminating duties, luxury taxes and other levies can make these products accessible to lower-income

[36] GSMA, The State of Mobile Internet Connectivity, 2024.
[37] GSMA, Mobile Gender Gap Report, 2023.

communities, simultaneously undercutting black market operations driven by high official retail prices.

Streamlining regulatory approvals and certifications can further reduce device prices. Complex or burdensome certification requirements currently limit market competition, inflating prices by imposing unnecessary compliance costs on manufacturers. By accepting widely recognised international standards, such as Europe's CE mark, G20 countries could simplify regulatory procedures, stimulate competition and drive retail prices downward. This approach would ensure broader market availability, making digital devices substantially more affordable and supporting inclusive digital participation across all populations.

Additionally, promoting robust second-hand device markets can significantly enhance digital affordability, especially for economically disadvantaged communities. The G20 can adopt policies that support transparent and regulated secondary markets, such as standardised device certification programmes, warranty guarantees and clear consumer protection regulations. Moreover, facilitating trade and reducing bureaucratic barriers specifically related to refurbished devices could dramatically lower device costs and extend the life cycle of technology products, thereby increasing digital inclusion.

Case study 1.5: Kenya's zero VAT on mobile devices

Kenya provides a notable example of how cutting taxes can spur mobile adoption. In June 2009, the Kenyan government exempted mobile phones from the 16% VAT as part of a policy to enhance access to ICT. This effectively removed a sizable consumption tax on handsets, immediately making phones cheaper for consumers. The rationale was that lowering handset prices would accelerate mobile penetration, which was around 50% at the time, and support Kenya's burgeoning digital economy. The tax change was championed by industry players and seen as a bold move to drive growth in mobile connectivity (which in turn was linked to broader economic growth). For several years, Kenya maintained this zero-VAT status on phones.

The impact of the 2009 VAT removal in Kenya was immediate and significant. In the first six months after the change, mobile penetration rose by 7 percentage points. Over the next four years, the number of mobile phone users in Kenya almost doubled — from about 17.4 million in mid-2009 to 29.8 million by early 2013. This corresponds to overall mobile penetration climbing roughly from the 50% range to about 75%. In industry terms, handset device sales "quadrupled" following the tax cut, as many Kenyans who previously could not afford a phone were able to buy one.

Mobile internet use also expanded rapidly: by 2013 Kenya had over 16 million internet users, 99% of whom accessed the internet via mobile devices (mostly phones). The economic benefits were tangible, for example, the World Bank and others note that a 10% increase in mobile penetration can boost GDP by around 1%, and Kenya's connectivity surge contributed to its tech-driven growth in the 2010s.

It's worth noting that in 2013, Kenya's government reintroduced the 16% VAT on phones under a new VAT Act, aiming to increase tax revenue once the market had grown. This led to a 16% jump in handset prices almost overnight. Industry stakeholders reported a sharp rise in grey-market phone imports as a result (unofficial "no-tax" sales grew from 20% to around 60% of the market) and warned that the tax could slow or even reverse the gains in mobile penetration achieved since 2009. The backlash underscored how sensitive the consumer market was to device pricing.

Kenya's case vividly demonstrates the elasticity of mobile demand relative to handset cost. Removing a hefty tax barrier unlocked a mass market — millions of people joined the mobile network when phones became even marginally more affordable. This underscores a lesson for other countries: upfront taxes on devices can be a major impediment to digital inclusion, and cutting those taxes can yield a rapid uptick in connectivity (with all its attendant social and economic benefits).

Conversely, Kenya's 2013 experience also serves as a caution: rolling back these tax incentives can exacerbate the digital divide by pushing prices up and users into the informal market. The surge in smuggled or counterfeit phones after the return of VAT on phones in Kenya highlighted that high taxes may not even yield the intended revenue, as consumers seek tax-evasive alternatives.

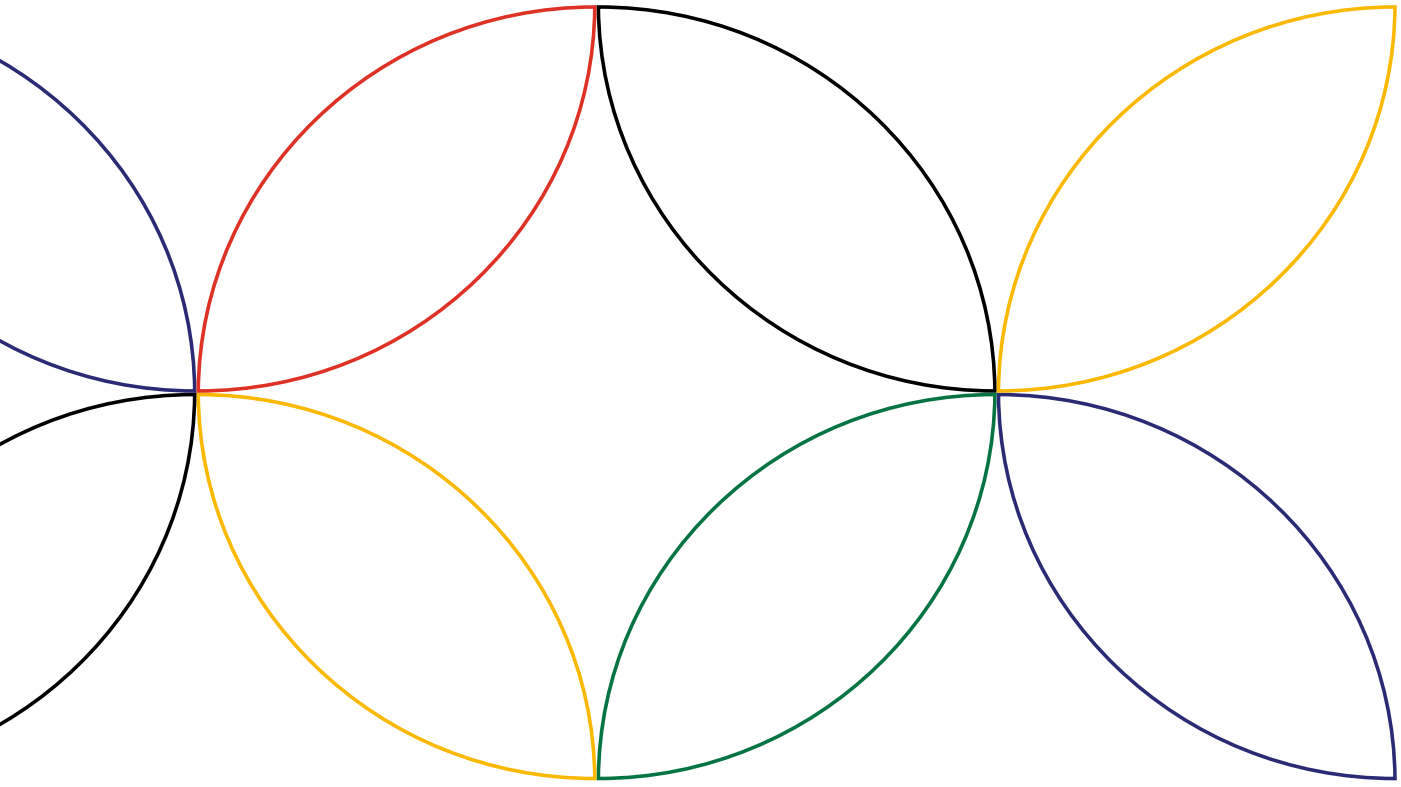
For policymakers, the Kenyan example suggests that keeping handset taxes low (or at zero) over the long term can sustain growth in mobile ownership. It also shows the importance of policy stability — sudden tax policy reversals can disrupt markets. Overall, Kenya's initiative provides evidence that tax reductions on consumer electronics like phones can pay off in both development and, indirectly, government revenues (through broader economic growth and taxes on usage or income as more people transact digitally).

The G20 is encouraged to provide supporting finance to disadvantaged communities for essential digital devices.

To ensure meaningful participation in the digital economy, it is imperative that the G20 actively supports disadvantaged communities by providing accessible financing solutions for digital devices. This can be achieved through the establishment or enhancement of targeted financing programmes, such as instalment payment plans or micro-loan initiatives, specifically designed to accommodate low-income users and start-ups that would otherwise be unable to afford essential smartphones, tablets or computers.

In addition to these financing options, the G20 is encouraged to offer direct financial support through well-designed subsidies or voucher programmes aimed explicitly at disadvantaged groups. These direct assistance can substantially reduce upfront costs, enabling broader and more immediate device ownership among communities that traditionally face barriers to digital inclusion. To ensure the success and scalability of these initiatives, implementation must prioritise simplicity and minimise administrative complexity. Historically, cumbersome processes in subsidy or voucher programmes have deterred participation from both suppliers and beneficiaries, limiting their effectiveness. Streamlining administration will not only enhance accessibility but will also maximise the reach and impact of financial support, promoting sustained and equitable digital adoption.

To further enhance the affordability and accessibility of essential digital devices, the G20 is encouraged to incentivise innovative financing mechanisms tailored specifically to disadvantaged communities. Leveraging alternative credit assessments, such as subscriber data to evaluate creditworthiness, can significantly expand access for those lacking traditional credit histories. Additionally, governments should collaborate through PPPs that employ first-loss guarantee arrangements, in which governments mitigate financial risks for mobile operators providing handset financing through instalment plans. These partnerships, combined with targeted subsidies delivered in collaboration with industry stakeholders, can effectively reduce economic barriers, enabling broader and more equitable digital inclusion.



Recommendation 2

Strengthen national digital literacy systems to equip the workforce with foundational and advanced capabilities aligned with future-oriented labour market demands

Recommendation 2:

Strengthen national digital literacy systems to equip the workforce with foundational and advanced capabilities aligned with future-oriented labour market demands

Actions

Action 2.1: Ensure universal basic digital literacy by prioritising digital education, training programmes, and inclusive learning resources.

Action 2.2: Synchronise tertiary education with industry demands to prepare the workforce for digital and AI-enabled jobs.

KPIs

Percentage of individuals without digital skills[38]

- Source: ITU
- Baseline: 38% (2023), target: 20% (2030)
- Aligned with previous B20 editions

Percentage of countries offering computer science-related (CS-related) education

- Source: Stanford AI Index
- Baseline: 66% (2024), target: 100% (2030)
- New indicator: CS-related education is a strong leading indicator that measures digital preparedness on a national scale. It recognises that widespread foundational digital literacy is critical to equipping the future workforce with relevant digital and AI skills. Greater emphasis is placed on digital literacy and education.

Percentage of MSMEs using enterprise technology platforms

- Source: OECD
- Baseline: 49% (2024), target: 90% (2030)
- Aligned with previous B20 editions

[38] Data for this KPI, is noted as "very scant" by the ITU. This Recommendation Paper calls for improved global data collection and reporting by governments and relevant agencies in this area.

Relevant G20 priorities

Recommendation 2 contributes to the priorities of the following groups:

- Engagement groups: Labour 20, Startup 20, Women 20 and Youth 20
- Working groups: Development, Digital Economy, Education, Employment, Trade and Investment, and Women Empowerment

Context

Digital and AI-driven technologies are fundamentally reshaping workplaces across all sectors, creating new jobs while simultaneously displacing existing ones. As industries become increasingly digitised, the nature of work is shifting dramatically, bringing both significant opportunities and substantial challenges for the global workforce.

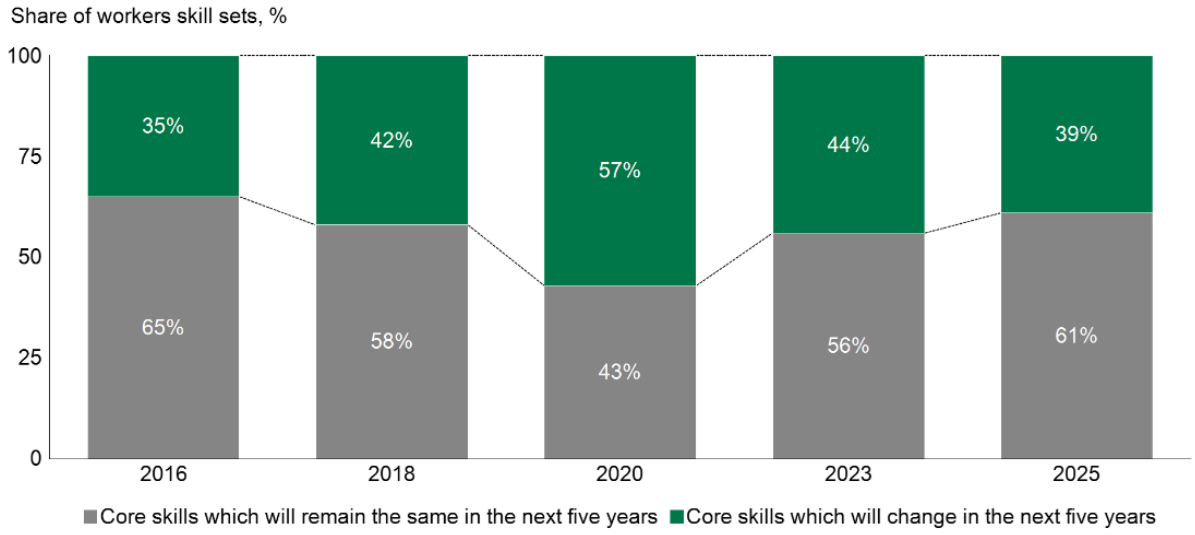
Central to addressing these challenges is the symbiotic relationship between digital literacy and practical digital skills. Digital literacy, typically developed through formal schooling, provides the foundation on which advanced, workplace-oriented digital skills can be built. Therefore, it is critical not only to foster digital literacy through education systems but also to proactively re-skill the existing workforce to meet current and future technological demands. However, significant global disparities in digital literacy and technological skills continue to undermine workforce readiness, especially as economic requirements rapidly evolve.

According to the latest WEF "Future of Jobs Report", employers anticipate that 39% of core job skills will fundamentally change by 2030, yet approximately 11% of workers globally are unlikely to receive adequate training to cope with these changes.[39] Consequently, even as demand surges for digitally capable and adaptable workers, skill acquisition remains insufficiently responsive, risking increased economic disparities and limiting inclusive participation in the evolving digital economy.

[39] WEF, Future of Jobs Report, 2025.

Exhibit 7: Rapid skills shifts highlight the need for workforce re-skilling and digital readiness

A significant portion of workers' core skills continues to evolve rapidly, underscoring the importance of investing in ongoing digital skills training to ensure workforce resilience and adaptability.



Source: WEF, 2025

The global labour market stands at a critical juncture, where re-skilling and workforce adaptation have become paramount. According to the WEF, between 2025 and 2030, technological advancements will reshape employment dynamics dramatically, creating approximately 170 million new jobs while displacing 92 million existing roles, amounting to a net gain of 78 million jobs globally.[40]

This challenge is further underscored by recent surveys by the GSMA indicating that a lack of digital literacy and digital skills represents the second most significant barrier to mobile internet adoption globally — and notably ranks as the top barrier across Asian countries.[41] Addressing these barriers through targeted digital literacy initiatives and comprehensive educational programmes is critical for enabling meaningful participation in digital societies and economies worldwide.

Without proactive investment in foundational digital literacy and advanced, future-oriented skills training, economies risk missing out on substantial productivity gains. Specifically, the G20 nations have the potential to collectively unlock an additional USD 11.5 trillion in cumulative GDP by 2028 if the digital skills gap is effectively addressed.[42] Therefore, immediate action to enhance digital literacy across populations is not merely beneficial, but economically essential. Achieving this requires improved mechanisms for tracking and evaluating digital literacy proficiency. To this end, the G20 is encouraged to mandate the ITU to improve global data collection to ensure more targeted and effective interventions. This tracking could further include institutional data, such as learner numbers, completion rates and career outcomes specific to these groups.

[40] WEF, Future of Jobs Report, 2025.
[41] GSMA, The State of Mobile Internet Connectivity, 2024.
[42] Rand Europe, The Global Digital Skills Gap, 2021.

Moreover, the persistent gaps in digital literacy exacerbate existing digital divides, disproportionately affecting women, rural communities, lower-skilled workers and ageing populations. Women, in particular, are highly vulnerable to digital transformation risks, with projections indicating that between 40 and 160 million women worldwide may need to transition occupations by 2030 due to automation-driven displacement.[43] Given that women constitute only 35% of global science, technology, engineering and mathematics (STEM) graduates — and an even smaller fraction, 26%, in data and AI fields — there is a clear risk that they will remain largely excluded from emerging digital opportunities, further widening economic and social inequalities.[44] As such, targeted initiatives aimed at empowering women with digital literacy will be crucial in closing this divide.

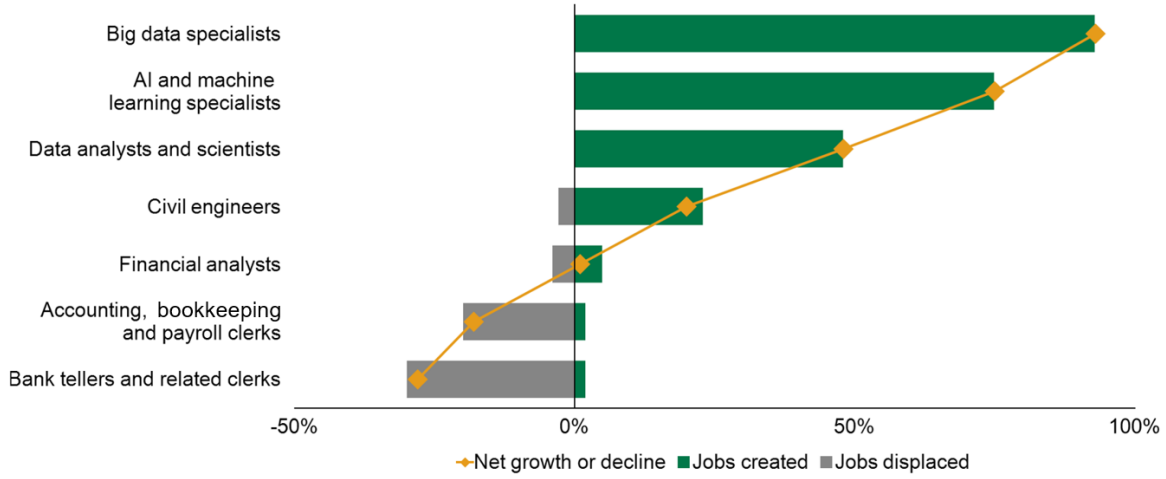
Addressing these digital literacy gaps is crucial not only for workforce preparedness but also for closing the usage gap in digital adoption. While infrastructure and affordability are key barriers, other important factors such as low levels of digital literacy, lack of locally relevant digital content, insufficient public digital services, cultural resistance to technology adoption and limited awareness of digital benefits pose significant obstacles to widespread adoption. Overcoming these barriers is essential to fully harness the potential of digital technologies, ensuring that individuals and businesses alike can participate meaningfully in, and benefit equitably from, the digital economy.

Several interconnected forces are reshaping global labour markets, intensifying the urgency of comprehensive digital and technological training. Chief among these drivers is the rapid acceleration of digital transformation and widespread AI adoption. Advances in AI, automation and digital technologies are continuously redefining job roles across nearly all sectors, increasing the need for extensive digital literacy training. According to the WEF, an overwhelming 86% of companies anticipate that AI-driven innovations will significantly alter their business models by 2030.[45] This technological revolution is creating substantial demand for digitally proficient talent, particularly in emerging roles such as AI specialists, big data analysts, cybersecurity professionals and digital marketing experts.

[43] McKinsey & Company, The Future of Women at Work: Transitions in the Age of Automation, 2019.
[44] UNESCO, Global Education Monitoring, 2024.
[45] WEF, Future of Jobs Report, 2025.

Exhibit 8: Projected job shifts from 2025-2030 show demand for digital and AI-related skills

Emerging job opportunities will increasingly require expertise in AI and data analysis, highlighting the urgency of aligning education and training with evolving digital labour market demands.



Source: WEF, 2025

Compounding this challenge is a persistent mismatch between traditional education systems and evolving industry requirements. Educational institutions — from primary education to technical and vocational education and training (TVET) programmes — have struggled to adapt rapidly enough to the changing digital economy. Employers consistently report critical skills gaps in specialised technical capabilities, adaptability, critical thinking and digital proficiency, which are not sufficiently addressed by current curricula. The WEF highlights that this mismatch will likely worsen, with 41% of employers expecting substantial re-skilling requirements within the next five years.

This skills gap is particularly apparent among tertiary education graduates, with 52% of employers indicating that graduates lack the advanced digital skills necessary for the contemporary workplace.[46] Primary reasons for this shortfall include outdated curricula, limited awareness within educational institutions regarding industry-specific digital skills needs, and teaching methodologies unsuited to the realities of the digital economy. To effectively bridge these gaps, it is imperative that education systems modernise curricula, closely align educational outcomes with private-sector needs and establish robust collaborative partnerships between educational institutions and industry stakeholders.

[46] Learning and Work Institute, Disconnected? Exploring the Digital Skills Gap, 2021.

Action 2.1

Ensure universal basic digital literacy by prioritising digital education, training programmes and inclusive learning resources.

Executive summary

To achieve this goal, the G20 is encouraged to:

I. Establish targeted training programmes to strengthen educators' AI competencies, ethical understanding and innovative teaching methodologies

II. Incorporate fundamental digital literacy and internet safety into standard education curricula

III. Expand digital literacy training initiatives, leveraging collaboration with tech companies and civil society

IV. Ensure digital literacy learning resources are tailored to local languages and cultures

Background and context

Basic digital literacy is essential for meaningful participation in the digital economy and society. While infrastructure provides the foundation, connectivity alone does not guarantee digital inclusion. Without fundamental digital literacy, large segments of the population remain unable to effectively engage with online platforms for critical activities such as accessing essential services, communicating, pursuing education or participating fully in civic life. The skills gap further reinforces existing socioeconomic disparities, underscoring the need for deliberate action to ensure equitable digital inclusion.

To effectively address these gaps, comprehensive educational programmes and inclusive resources must be developed, carefully tailored to accommodate diverse demographic needs, linguistic differences and cultural contexts. Ensuring that all learners, as well as broader communities, acquire basic digital literacy — including competencies such as internet safety, online communication and essential digital problem-solving — will provide the necessary foundation for more advanced vocational and technical training. These foundational efforts not only enhance individual employability and productivity but also drive broader societal inclusion, as communities become better equipped to participate fully in the rapidly evolving digital world. Importantly, several proven initiatives and scalable programmes already exist and could serve as models for expanded implementation.

The G20 is encouraged to prioritise educator development by establishing targeted training programmes to strengthen educators' AI competencies, ethical understanding and innovative teaching methodologies.

Building an inclusive digital literacy ecosystem begins with enhancing the capabilities of educators, positioning them at the heart of digital transformation efforts. The G20 is encouraged to invest strategically in professional development initiatives designed specifically to equip educators with advanced proficiency in AI and related digital technologies. This training should encompass practical, hands-on experiences with cutting-edge AI tools, enabling educators to confidently integrate technology into their classrooms, and effectively convey its implications for industry, society and everyday life.

Furthermore, these educator training programmes should systematically incorporate ethical considerations and innovative teaching methodologies, ensuring the responsible, transparent and effective use of AI in educational settings. Leading educational authorities, such as the Association to Advance Collegiate Schools of Business, highlight the necessity of comprehensive institutional support structures aimed at upgrading educators' technical skills, ethical frameworks and pedagogical approaches. Recommended practices include faculty training that imparts practical AI competencies and deeper awareness of AI's societal impacts, clear institutional guidelines governing ethical AI use — particularly regarding transparency, fairness and data privacy — and robust digital skill assessments that prioritise critical thinking, creativity and effective application of AI technologies. Investing deliberately in educator preparedness in these ways will significantly elevate teaching quality, ensuring that future generations are thoroughly equipped to navigate and leverage the complexities and opportunities of a digitally driven global economy.

Case study 2.1: Italy's National Digital School Plan (Piano Nazionale Scuola Digitale)

Launched in 2015 as part of "La Buona Scuola" (The Good School) reform law, Italy's Piano Nazionale Scuola Digitale (PNSD), or National Digital School Plan, is aimed to reposition Italy's schools for the digital era. The plan addresses the major challenges of modernising classrooms and curricula, reducing Italy's internal digital divide in education (such as disparities between urban and rural or northern and southern schools) and equipping students with the competencies needed in a technology-driven society.

The PNSD is structured around key pillars — improving tools and spaces (hardware, connectivity and digital environments), developing digital skills and educational content, and training and empowering educators — all with the ultimate goal of creating an innovative, inclusive school system.

- The government invested in providing broadband internet access and Wi-Fi coverage to every public school, narrowing a longstanding gap between well-connected and poorly connected regions. By the end of the plan's initial phase, all 8,000-plus Italian schools were equipped with high-speed connectivity and new digital equipment, such as interactive whiteboards, tablets and advanced computer labs.
- The PNSD introduced nationwide systems like the electronic student register, which digitised attendance and grade books in every primary and secondary school. It also encouraged the integration of coding and computational thinking into the curriculum: for example, coding classes or modules were introduced at various grade levels to build students' programming skills from an early age.

- A cornerstone of the plan was the creation of dedicated new roles to champion digital innovation within each school. Starting in late 2015, every Italian school appointed a teacher as a "digital animator" (animatore digitale) — an in-house technology leader responsible for promoting innovative teaching methods, organising teacher training and guiding the school's digital strategy. These animators, supported by small teams, acted as change agents to help colleagues integrate tech into lessons. Alongside this, the government rolled out extensive professional development programmes: thousands of teachers and school staff underwent training in digital pedagogy and ICT tools. By 2017, over EUR 200 million had been allocated for teacher training alone, and tens of thousands of teachers received upskilling through workshops and online courses.

Italy's experience shows that a holistic national strategy is effective in driving educational digital transformation. One key lesson is the importance of addressing multiple dimensions simultaneously: the PNSD combined infrastructure build-out, content/curriculum changes and human capacity-building rather than tackling these in isolation. This comprehensive approach ensured that new technology (like broadband and tablets) did not sit idle — teachers were being trained and new digital content was being developed at the same time, creating an ecosystem where each element reinforced the others.

The introduction of a digital animator in each school is a noteworthy practice; it highlights the value of having on-site champions to sustain momentum and support colleagues day-to-day. Other countries can learn from this model of designating "change leaders" at the micro level to complement macro policy.

The G20 is encouraged to incorporate fundamental digital literacy into standard education curricula.

To achieve broad-based digital inclusion, the G20 could prioritise the integration of fundamental digital literacy and internet safety education into curricula at every educational level — from early schooling through secondary education. Core topics should encompass basic computer skills, digital communication tools, online safety, digital citizenship and ethics, using the internet for research and learning, and effective prompt engineering, coding and problem solving, and data/answer scepticism.

Early and consistent engagement with these foundational digital competencies will equip students to confidently, safely and effectively navigate the digital landscape. Mastery of these fundamentals will also lay the groundwork for advanced, specialised skills, such as e-commerce and other digital business practices, further enhancing students' readiness for the digital economy.

Establishing clear and measurable standards is critical to ensure that all students graduate with essential digital proficiencies. Countries can learn from successful international models: for example, China has successfully integrated AI and digital literacy as mandatory curriculum elements, demonstrating the benefits of early and sustained educational investment in digital competencies.

Additionally, prioritising access to advanced AI technologies, including large language models (LLMs), within schools can further enhance digital literacy and learning outcomes. By adopting and promoting universal best practices for educational use of these tools, the G20 can ensure their safe, effective and equitable deployment. Collaboration with private education groups and industry partners will be instrumental in facilitating access to these

resources, promoting innovation and enriching digital education. These partnerships will help drive scale and effectiveness, ultimately equipping students worldwide with the skills necessary to thrive in an increasingly digital and interconnected economy.

Case study 2.2: Girls4Tech's signature STEM programme

A thriving digital economy needs more than connectivity and digital infrastructure. It depends on the availability of a tech-skilled workforce. While data on the digital skills gap is scarce and mostly concentrated in advanced economies, all estimates indicate that most jobs now require some level of digital skills and that all economies suffer from a growing tech skills shortage. Bridging the gaps between the demand for digital skills and the digital readiness of the workforce around the world will require heavy investment from both governments and the private sector. To address this gap, Mastercard deploys its employees to serve as role models and mentors through a signature STEM curriculum based on global science and math standards that uses payments technology — algorithms, encryption, fraud detection, data analysis, digital convergence and the cross-border network — to offer an interactive, hands-on curriculum connecting the foundations of payments business to STEM principles. The programme shows girls across the globe that it takes all kinds of interests and skills to pursue a career in STEM.

Launched in 2014, the programme has been translated into 23 languages reaching more than seven million girls aged 8 to 25. Mastercard hosted more than 500 Girls4Tech events in 65 countries. As the reach grew, the curriculum expanded to meet the skills training and educational needs of different segments. Girls4Tech now includes nine programmes — Girls4Tech; Girls4Tech in a Day; Girls4Tech 2.0 for high school girls; Girls4Tech & Code, a 20-week mentoring/coding programme; Girls4Tech Cybersecurity & AI; Girls4Tech & Sports; Girls4Tech Afterschool; Girls4Tech Python and Java Bootcamps.

The programme targets a global problem. While 80% of jobs created in the next decade will require STEM skills, women currently represent only 30% of the current STEM workforce. Through PPPs like Girls4Tech, both the digital skills shortage and the digital gender divide can be addressed.

The G20 is encouraged to expand digital literacy training initiatives, leveraging collaboration with tech companies and civil society.

To meaningfully enhance digital literacy training on a global scale, the G20 is encouraged to actively foster partnerships between governments, technology companies and civil society organisations. Collaborations with tech companies can drive innovation in digital education through structured corporate volunteering programmes, mentorship initiatives and direct industry involvement, thereby transferring valuable industry knowledge and best practices directly to learners.

At the same time, the G20 is encouraged to increase support for civil society and NGO-led digital training initiatives, such as community-based digital workshops and mobile training labs. These programmes are particularly effective at reaching underserved communities, offering tailored and accessible training that addresses local digital literacy gaps and barriers. Scaling up these initiatives through targeted funding and resource allocation will broaden their reach, significantly advancing equitable digital inclusion and ensuring that more individuals and communities gain the digital literacy necessary to participate fully in the digital economy.

Case study 2.3: South Africa — Mindjoy's AI-powered STEM learning platform

Mindjoy is a South African education technology start-up reinventing STEM education through an AI-native platform. Founded in 2021, Mindjoy aims to make coding and digital skills more accessible and engaging for young learners and educators alike. The platform supports learning on any internet-enabled device, addressing the gap in practical digital education within traditional schooling systems. With a focus on project-based learning in real programming languages and a browser-based coding environment (Replit), Mindjoy eliminates the need for specialised hardware or software.

Currently, over 50 schools and 10 university faculties across Africa, the United Kingdom and North America use Mindjoy. The platform allows learners to direct their own education through a blend of AI systems and human coaching. It offers live, small-group virtual coding classes for children as young as 8, encouraging exploration, teamwork and real-time feedback in a supportive learning environment.

Mindjoy developed an "AI-first" learning platform that prioritises fun, interactivity and collaboration. Starting with a closed beta, the team refined its student-friendly approach through hands-on feedback. The platform integrates 24/7 multilingual AI learning agents, automated content and assessment creation, and tools for team STEM projects. Human coaches play a critical role, guiding learners while AI delivers real-time, personalised feedback.

By 2024, Mindjoy incorporated LLMs to further tailor tutoring and deliver learning analytics. Its educational philosophy, "learning by doing, not watching", "social learning by design" and "AI as a learning companion", has made the platform highly effective, reaching students in countries including the United Kingdom, Spain and Hungary.

Mindjoy demonstrates how a thoughtfully designed educational technology platform can dramatically enhance student engagement and outcomes. It has led to a 20-fold increase in student engagement and boosted exam scores by 17 percentage points in participating institutions, such as North-West University, Nelson Mandela University and Stellenbosch University.

Key takeaways include: the power of blending human coaching with AI to create personalised, scalable learning experiences; the importance of social, project-based learning to foster motivation and deep understanding; and how adaptive, data-driven methods can quickly improve education quality.

Case study 2.4: Africa — Google Skillshop's free online digital skills training

Google Skillshop is an online learning platform provided by Google to help people develop digital skills, particularly in using Google's professional tools and advertising services. It offers free, self-paced courses that allow learners to train in topics like Google Ads, Analytics, YouTube marketing and more, earning official certifications along the way. In essence, Skillshop serves as a one-stop training centre where anyone with internet access can get up-to-date instruction on Google's products and broader digital marketing skills. The platform is available globally (in multiple languages) and caters to a wide range of proficiency levels — from beginners learning the basics of online advertising to experienced marketers seeking advanced credentials.

Through Skillshop, Google has made professional-grade training widely accessible at no cost — users can take interactive lessons, practice with real-world scenarios and attempt certification exams. The initiative has been rolled out globally, complementing Google's other digital skills programmes (such as Grow with Google and Digital Garage) with more specialised coursework. Millions of users — including small business owners, students and marketing professionals — have engaged with Skillshop content to improve their capabilities in areas like search advertising, analytics and cloud computing tools. By offering recognised certificates (e.g., Google Ads Certified), the platform also helps learners boost their career credentials.

Google Skillshop showcases how private sector platforms can play a significant role in upskilling the workforce at scale. A notable lesson is the importance of accessibility: by providing free, on-demand education, tech companies can lower the barrier for individuals to gain in-demand skills, regardless of their location or financial means. The popularity of Skillshop also underlines that industry-recognised certifications can incentivise learners and add value in the job market.

For policymakers, Skillshop's success suggests that partnering with or encouraging these private digital training initiatives can complement formal education, rapidly filling knowledge gaps in areas like digital marketing, data analytics and IT. It demonstrates a scalable model for lifelong learning in the digital economy.

The G20 is encouraged to ensure digital literacy learning resources are tailored to local languages and cultures.

To ensure broad and inclusive engagement with digital literacy programmes, the G20 is encouraged to prioritise the development of educational resources specifically tailored to local languages and cultural contexts. Digital learning materials must not only be linguistically accessible but also culturally relevant, incorporating examples, contexts and scenarios that resonate with local communities. Doing so will encourage wider adoption, deeper understanding and greater sustained participation in digital education initiatives, especially within underserved populations.

Simultaneously, it remains essential for the G20 to continue advocating for education in major international business languages. Introducing young learners to these global languages at an early stage ensures they develop the linguistic skills required to effectively engage in cross-cultural communication, trade and collaboration. This dual approach — prioritising both local relevance and global connectivity — will foster balanced digital competence, enabling individuals to thrive locally and participate actively in an interconnected global economy.

Action 2.2

Synchronise tertiary education with industry demands to prepare the workforce for digital and AI-enabled jobs.

Executive summary

To achieve this goal, the G20 is encouraged to:

I. Modernise tertiary curricula to align with digital industry skill demands

II. Strengthen collaboration between industry and education providers through apprenticeship and internship models to improve workforce readiness

III. Expand widespread digital literacy training programmes targeted at the current workforce

IV. Launch targeted digital literacy initiatives for unemployed adults

Background and context

Rapid digitalisation and the accelerating adoption of AI are reshaping global job markets, dramatically shortening the half-life of knowledge and fundamentally altering the skills required for modern employment. As knowledge becomes outdated more rapidly than ever before, traditional education systems struggle to adapt quickly enough to these evolving demands. This has created a widening gap between academic curricula and practical industry needs, leaving graduates inadequately prepared and limiting their immediate employability.

To overcome these challenges, education systems must urgently transition towards flexible, responsive learning models that regularly integrate real-time industry feedback. Streamlining accreditation processes and frequently updating curricula are critical to ensuring that educational offerings reflect current market requirements. To enhance this responsiveness, it is essential to create a pathway for accelerated accreditation processes, enabling learners to be fast-tracked to high-demand roles. This alignment will empower both new and experienced workers to rapidly acquire relevant, future-oriented competencies, thereby strengthening their resilience, employability and competitiveness in a swiftly changing digital economy.

The G20 must modernise tertiary education curricula to align with digital industry skill demands.

To effectively bridge the gap between tertiary education and the evolving needs of the digital economy, the G20 should prioritise comprehensive modernisation of educational curricula. TVET programmes must explicitly integrate critical digital competencies, including programming, data analysis, cybersecurity and other skills directly aligned with contemporary industry requirements. Similarly, university programmes in ICT and engineering should expand and continually update their curricula to reflect emerging specialisations, such as AI, cloud computing and advanced cybersecurity. By closely synchronising course content with industry standards, graduates will gain skills that are immediately relevant and highly valued in the labour market.

In addition, innovative certification mechanisms should be introduced to enhance the transparency and portability of qualifications. Establishing a comprehensive digital database of skills and integrating blockchain-based credentials and micro-credentials would offer secure, internationally recognised and easily verifiable proof of competencies. This should then be linked to outcomes by requiring educational institutions to demonstrate up-to-date, labour market-aligned curricula, based on market data and graduate success. These systems would also enable smoother recognition of skills across borders, facilitating global employment opportunities.

Moreover, the G20 could encourage innovative educational governance models, such as decentralised autonomous organisations, which leverage blockchain technologies to manage educational initiatives collaboratively, transparently and effectively. Finally, the promotion of massive open online courses would further democratise access to high-quality education, offering flexible and scalable pathways to skill development and lifelong learning. This entails leveraging multi-modal online learning by mixing readings, videos, interactive exercises, tutorials, visual content and assessments to suit various learning styles and abilities. These combined measures would significantly strengthen workforce readiness, ensuring individuals are well equipped to thrive in the digitally driven global economy.

Case study 2.5: Singapore's curriculum revamp for digital skills

Singapore undertook a significant overhaul of its polytechnic education system to better meet industry demand for advanced digital skills. This case focuses on curriculum reforms implemented across Singapore's five polytechnics (tertiary institutes that offer vocational diplomas) around 2020-2023 to ensure graduates are prepared for the digital economy.

A key element of the reform is the introduction of a Common Core Curriculum that all polytechnic students must take, emphasising both technical proficiencies in areas like AI, data analytics and cybersecurity, as well as essential 21st century skills like critical thinking and interdisciplinary problem-solving.

In parallel, Singapore's polytechnics forged new partnerships with technology companies to keep course offerings up to date and to provide students and even adult learners with real-world training resources. The initiative aligns with Singapore's national strategies (such as its National AI Strategy) to cultivate a tech-skilled workforce and maintain the country's competitive edge in innovation.

The polytechnics established formal partnerships with major tech companies to co-develop course content, offer certification opportunities, and expose students to the latest technologies. For instance, in 2023 a partnership with IBM was launched to provide more than 1,000 free online courses in high-demand tech areas such as AI, cloud computing and cybersecurity to polytechnic students and adult learners.

Polytechnics also continuously update their specific diploma offerings to match industry trends — for example, launching new diplomas in fields like cloud engineering and financial technology, and embedding modules on AI ethics and applications into existing courses. By late 2023, Singapore Polytechnic reported that it had even incorporated generative AI tools into its teaching, both as content (teaching prompt engineering and AI ethics) and as a way to enhance learning experiences.

Singapore's approach provides a model for agile curriculum reform in higher education. One key lesson is the benefit of a core curriculum that spans all programmes — this ensures no student is left behind in acquiring fundamental digital skills, an approach that could be replicated in other countries' vocational and university systems. It guarantees a level of digital literacy across the board, which is increasingly important as technology permeates every industry.

Another lesson is the importance of close industry alignment: by collaborating with tech companies (like the IBM SkillsBuild partnership), educational institutions can rapidly bring cutting-edge knowledge and resources into the classroom. This not only keeps the curriculum relevant as technology advances, but also often provides students with industry-recognised credentials or project experience, improving their job readiness.

Lastly, the inclusion of adult learners in these upskilling initiatives is a noteworthy element: it underscores that building a digitally skilled society is not just about the traditional student pipeline, but also about continuously re-skilling the existing workforce. By opening up courses to adult learners (often in evening or online formats), Singapore addresses immediate industry skill gaps and promotes lifelong learning.

The G20 is encouraged to strengthen collaboration between industry and education providers through apprenticeship and internship models to improve workforce readiness.

Building on modernised curricula, the G20 can foster stronger collaboration between industry stakeholders and educational institutions to ensure that learning remains closely aligned with evolving market demands. Facilitating direct partnerships, particularly with technology firms and leading businesses, will enable joint curriculum design and ensure that educational content stays relevant, practical and responsive to real-world industry requirements.

Furthermore, governments should actively support structured internship, apprenticeship and practical training programmes that seamlessly connect classroom instruction with hands-on industry experience. By embedding real-world digital skills training within education pathways, learners can gain valuable, applied experience, significantly improving their employability and readiness for immediate entry into the workforce. This collaboration between academia and industry not only enriches education quality but also bridges the gap between theoretical knowledge and practical competencies, ultimately strengthening workforce resilience in an increasingly digital economy.

Case study 2.6: Rwanda — African Centre of Excellence in Internet of Things

The African Centre of Excellence in Internet of Things (ACEIoT) is a specialised academic and innovation hub based in Rwanda that focuses on training high-level experts and conducting research on the Internet of Things (IoT) and related emerging technologies. Established in 2017 at the University of Rwanda's College of Science and Technology, ACEIoT was created under the World Bank's Africa Centers of Excellence programme, which sought to build regional capacity in science and technology fields.

ACEIoT's mandate is to offer advanced degrees (master's and doctorate) in IoT disciplines, such as wireless sensor networks, embedded computing systems and data analytics, to students from across Africa. By doing so, it aims to address the shortage of specialised tech expertise on the continent and to generate home-grown innovative solutions.

Since its inception, ACEIoT has developed a robust postgraduate programme and research ecosystem. It launched two master's degree tracks and a doctorate programme focused on IoT, enrolling students from numerous countries including Rwanda, Uganda, Kenya, Tanzania, Ethiopia and others. The curriculum balances theory with practical and entrepreneurial components: students not only take courses in IoT hardware, software and data science, but also participate in hands-on labs and industry internships.

State-of-the-art IoT laboratories were set up on campus, equipped with modern networking devices, sensors and prototyping tools, funded by the World Bank and partner contributions. By 2022, two cohorts of master's students had graduated from ACEIoT (over 70 MSc graduates in total) and the first cohort of doctorate candidates (who began in 2017) complete their doctorates (nine doctorate graduates by late 2022).

Research output from the centre has been notable: ACEIoT students and faculty have worked on dozens of pilot projects applying IoT solutions to African contexts. Some examples include a "smart farming" system that uses sensors and AI to monitor crop health and soil conditions (developed by a master's student to help local farmers increase yields), and an IoT-based electricity grid monitoring tool designed to detect power theft and inefficiencies in real time (created by a graduate to assist utilities in Rwanda).

ACEIoT illustrates how targeted investment in higher education can yield a new generation of skilled professionals in niche tech fields for developing regions. One major lesson is the importance of regional relevance: the centre's programmes are tailored to address Africa's specific development challenges (e.g., agriculture, healthcare, energy reliability) through IoT solutions. This ensures that graduates' skills are not only theoretical but directly applicable to pressing needs in their home countries, increasing their value in the job market and their potential to become tech entrepreneurs.

Another lesson is that partnership-driven models can rapidly elevate the quality of education. By tapping into global expertise (through academic exchange and industry input), ACEIoT was able to offer training comparable to international standards, which helps curb "brain drain" because students no longer need to go overseas for high-end tech education — they can get it in Africa and often stay to contribute locally.

The centre's success also underscores the effectiveness of the World Bank's Centers of Excellence framework, which incentivises measurable outcomes (such as number of graduates, research publications and external research funding attracted) and autonomy for the centres to manage resources. ACEIoT used this flexibility to create a conducive research environment that has, within a few years, led to numerous publications and innovations emerging from Rwanda.

For policymakers, ACEIoT's experience suggests that establishing specialised centres in partnership with global networks can be a powerful way to build capacity in advanced STEM fields, but it requires sustained funding commitments and a strategy to retain talent post-graduation (e.g., by connecting graduates with local industry or start-up incubators).

The G20 is encouraged to expand widespread digital literacy training programmes targeted at the current workforce.

Recognising that digital transformation impacts not only future entrants but also the current workforce, the G20 is encouraged to actively expand comprehensive training initiatives aimed specifically at existing employees. Financial incentives, such as targeted tax credits or subsidies, should be offered to companies that implement robust digital training and employee upskilling programmes. By providing direct incentives, governments can effectively motivate businesses to invest in continuous workforce education, enhancing digital readiness and ensuring employees remain competitive in an evolving labour market.

Additionally, the G20 is encouraged to establish individual learning accounts or similar direct funding mechanisms, granting workers greater autonomy in accessing continuous digital education opportunities. These accounts can empower individuals to tailor their learning pathways according to their specific career goals, promoting lifelong learning and sustained adaptability in the digital economy.

To further enhance these initiatives, the G20 is encouraged to leverage innovative decentralised technologies, such as Web3, to facilitate agile, responsive and scalable skill-building solutions. As traditional educational models often struggle to keep pace with rapidly evolving digital technologies, Web3-based decentralised communities can offer quicker and more flexible approaches to literacy acquisition. These decentralised models shorten the distance between innovation and practical application, supporting real-time delivery of relevant knowledge. They also enable novel identity and certification systems, reducing dependency on traditional intermediaries, simplifying skill validation and increasing trust in credentials. Coupled with AI-driven hyper-personalisation, these decentralised platforms can tailor learning experiences to individual needs, significantly boosting engagement and effectiveness. Finally, emphasising localised training ensures that programmes resonate culturally and contextually, maximising their relevance and adoption among diverse communities, ultimately leading to broader, more inclusive digital skill development across the global workforce.

The G20 is encouraged to launch targeted digital literacy initiatives for unemployed adults.

Unemployed adults should not be excluded from the opportunity to participate in the shifting digital landscape, as it poses a significant opportunity for broader participation. As such, G20 countries could launch targeted digital literacy initiatives specifically aimed at unemployed adults, equipping them with practical, industry-aligned competencies that transition them into emerging, high-demand digital roles. These initiatives could leverage successful models like Amazon's AWS Skills Center, which provides free, accessible cloud computing training tailored to adults with limited or no previous digital experience. By supporting similar PPPs, providing direct funding and facilitating rapid accreditation of these targeted literacy programmes, the G20 can effectively address critical skills shortages, enhance labour market inclusion and ensure that digital transformation benefits a wider segment of the workforce, especially those currently unemployed or displaced by technological change.

Case study 2.7: South Africa — Amazon Web Services Skills Center

The Amazon Web Services (AWS) Skills Center was launched in Cape Town in 2023 as AWS' first international training facility situated outside the United States. Its primary purpose is two-fold: addressing South Africa's digital skills deficit, while simultaneously enabling unemployed persons to enter the workforce — through targeted cloud computing training. Therefore, the initiative targets both unemployed adults and individuals without any prior digital backgrounds and facilitates entry into high-demand digital roles.

This training entails free, accessible, instructor-led courses in cloud computing fundamentals with a focus on practical application. AWS also provides complementary services, such as career coaching, mentorship and facilities to connect participants with local employers. Ultimately, participants can then obtain industry-recognised certifications, such as the AWS "Certified Cloud Practitioner" certification, which enables easier entry into the workforce. As of 2024, more than 20,000 learners have participated in this training, which has paved the way towards entering the workforce.

The AWS Skills Center demonstrates the effectiveness of targeted, accessible digital re-skilling initiatives specifically designed for unemployed adults. By removing barriers to entry through free training and practical support services, such initiatives rapidly bridge skill gaps and facilitate immediate employment opportunities. Additionally, strong partnerships with industry stakeholders and comprehensive learner support, such as career guidance and mentorship, are critical in successfully transitioning previously unemployed individuals into productive digital roles. The case study illustrates the value of public-private collaboration in expanding inclusive digital training programmes and highlights a scalable model that can be replicated across the G20.

Recommendation 3

Advance secure, trustworthy, inclusive and human-centric AI grounded in ethical standards, regulatory clarity and transparent practices

Recommendation 3:

Advance secure, trustworthy, inclusive and human-centric AI grounded in ethical standards, regulatory clarity and transparent practices

Actions

Action 3.1: Align countries to a coherent and accountable AI governance framework as a shared basis for ethical development and regulation of AI.

KPIs

Percentage of individuals reporting trust in AI systems

- Source: KPMG
- Baseline: 46% (2025), target: 85% (2030)
- New indicator: The B20 South Africa has a stronger focus on AI governance and accountability, where public trust in AI is an indirect indicator of the success of governance efforts. This KPI rests on the underlying assumption that trust is essential for widespread adoption and effective implementation of AI.

Average government AI readiness score

- Source: AI 4 Democracy
- Baseline: 66 (2024), target: 90 (2030)
- Aligned with previous B20 editions

Relevant G20 priorities

Recommendation 3 contributes to the priorities of the following groups:

- Engagement groups: Civil Society 20, Science 20 and Women 20
- Working groups: Development, Digital Economy and Women Empowerment

Context

AI is emerging as a defining technology of our era, yet regulatory frameworks governing its development and application vary significantly worldwide. This global inconsistency is substantial. According to 72% of the members of a panel of AI strategy experts that Massachusetts Institute of Technology (MIT) assembled, there is inadequate international alignment on codes of conduct and standards, which complicates the ability of global companies to implement responsible AI practices consistently.[47] Different countries have adopted markedly different regulatory philosophies in response to the opportunities and risks presented by AI. In making this recommendation, the Task Force emphasises that it is calling for global political alignment toward a single, coherent set of principles for AI governance, with the objective of fostering interoperability across existing national and regional policy frameworks.

Nations such as the United States and Singapore have chosen market-driven approaches, promoting AI development through minimal regulatory intervention, aiming to enhance competitiveness and innovation. By comparison, the United Kingdom and South Africa currently adopt a more cautious observational stance, refraining from imposing strict regulations while closely monitoring developments. In contrast, Canada and the European Union have established rigorous, risk-focused regulatory frameworks, emphasising human rights protection and accountability measures. Meanwhile, countries such as China and the UAE have integrated AI regulation into broader state-driven strategies, prioritising government oversight, national security and state-led technological advancement.

This pronounced diversity in regulatory approaches illustrates the challenge — and necessity — of developing coherent, internationally aligned AI governance to ensure effective and responsible global deployment of AI technologies. A mix of both market-driven and rigorous, risk-focused approaches is necessary.

The absence of consistent global AI governance is more than merely an administrative or compliance issue — it carries far-reaching consequences for businesses, economies, societies and democratic institutions worldwide. Fragmented regulatory approaches create significant implementation difficulties, resulting in operational uncertainty and conflicting obligations that hinder companies' ability to responsibly deploy AI on a global scale. [48] Industry experts have repeatedly underscored that the stark differences between national regulations and international guidelines frequently force multinational organisations to prioritise local compliance over coherent global standards.[49] This dynamic encourages selective adherence to standards and leads to the inconsistent application of Responsible AI (RAI) principles across company operations, undermining both corporate accountability and public confidence.[50] For example, Amazon's abandonment of its AI-driven recruitment tool due to persistent gender bias highlights how inconsistent adherence to RAI standards can lead to ethical breaches, reputational damage and a loss of public trust.

[47] MIT Sloan Management Review, A Fragmented Landscape Is No Excuse For Global Companies Serious About Responsible AI, 2024.
[48] Global Counsel, AI: Understanding A Fragmented Policy Landscape, 2025.
[49] MIT, Policy Associate, Unico IDtech.
[50] MIT, Senior Director of AI Governance, AI Singapore; MIT, Manager, Responsible AI Institute.

The strategic implications also extend well beyond corporate boundaries. Inconsistent or unclear governance frameworks erode public trust, directly affecting AI adoption and limiting potential economic and social benefits. Without clear regulatory guidance, public anxiety over possible misuse of AI — including concerns around intrusive surveillance, privacy breaches, discriminatory biases and opaque decision-making processes — could significantly dampen public enthusiasm and willingness to engage with AI-driven technologies. This can already be seen with the recent introduction of unregulated technologies. By way of example, trust in AI stood at 63% in 2022 (before ChatGPT's release). This has plummeted to 46% in 2025, based on recent surveys by KPMG.[51] This distrust is influencing investment patterns, with an IBM survey showing that 56% of business leaders are currently withholding major investments in transformative AI projects, awaiting more definitive regulations and standards.[52] The resulting hesitation and investment delay could substantially slow technological progress and innovation, impacting competitiveness at national and global scales.

At an ethical and societal level, the implications of unchecked AI development are even more profound. The European Parliamentary Research Service highlights several critical ethical dimensions requiring immediate attention, including equitable sharing of AI's benefits to prevent widening societal inequalities, such as ensuring advanced AI-based healthcare diagnostics reach underserved rural areas rather than remaining confined to privileged urban centres.[53] Establishing clear accountability frameworks is also paramount, particularly in scenarios involving autonomous systems whose decisions carry significant real-world consequences, exemplified by autonomous vehicle incidents.[54] Additionally, proactive policies must be enacted to prevent AI-facilitated exploitation in labour markets, particularly within gig economies where algorithmic optimisation can negatively impact working conditions without enhancing workers' compensation or rights.[55]

The impact of AI governance on women is also especially important, since deficient regulation can lead to discriminatory practices towards women. By way of example, a UNESCO study found that women were portrayed in domestic roles around four times more than men across major generative AI models — perpetuating regressive stereotypes.[56] Therefore, AI poses various risks in relation to equality.

Several critical drivers contribute to the global fragmentation of AI governance, complicating international efforts to align standards and regulatory approaches effectively.

[51] KPMG, Trust, Attitudes, and Use of Artificial Intelligence, 2025.
[52] IBM Institute for Business Value, Why Invest In AI Ethics and Governance, 2024.
[53] European Parliament, The Ethics of AI: Issues and Initiatives, 2020.
[54] European Parliament, The Ethics of AI: Issues and Initiatives, 2020.
[55] European Parliament, The Ethics of AI: Issues and Initiatives, 2020.
[56] UNESCO, Challenging Systemic Prejudices, 2024.

First, the absence of a common taxonomy and universally accepted definitions significantly hinders international consensus on AI governance. Definitions of AI vary widely among influential jurisdictions. For example, the United States and the European Union broadly define AI to include all machine-based systems capable of making decisions, recommendations or predictions, whereas the United Kingdom employs a narrower classification focused specifically on adaptivity and autonomy.[57] Experts underscore that even fundamental concepts frequently discussed in AI governance, such as fairness, safety and transparency, lack universally agreed-upon definitions, further complicating coherent policy development and implementation.[58]

Second, cultural and political differences exacerbate the difficulty of translating broad ethical principles into actionable, concrete regulations. Different countries have distinct priorities driven by their unique cultural, political and economic contexts, leading to markedly different regulatory focuses.[59] For instance, certain nations emphasise individual privacy and human rights protection, while others prioritise innovation, competitiveness or national security concerns. These divergent priorities make it challenging to establish globally accepted norms and regulations, as policy frameworks suitable in one cultural or political context may not readily transfer to another.[60]

Finally, insufficient international collaboration remains a critical barrier to achieving global regulatory alignment. Although multiple frameworks and guidelines for responsible AI use have emerged globally, they tend to be fragmented and region-specific, varying significantly in scope, detail and enforceability.[61] According to international governance experts, the current degree of international alignment remains inadequate for global companies to effectively adopt consistent responsible AI practices across jurisdictions.[62] Without more robust and coordinated international collaboration, developing universally accepted standards, coherent regulatory frameworks and enforceable governance structures will remain elusive, limiting the effective global governance of AI technologies.

[57] MIT, Chief AI Scientist, IAG.
[58] MIT Sloan Management Review, A Fragmented Landscape Is No Excuse For Global Companies Serious About Responsible AI, 2024; Senior Director of AI Governance, AI Singapore.
[59] MIT, Legal Technology Fellow, Stanford University.
[60] MIT, Manager, Responsible AI Institute.
[61] MIT, Rector, United Nations University.
[62] MIT, Rector, United Nations University.

Action 3.1

Align countries to a coherent and accountable AI governance framework as a shared basis for ethical development and regulation of AI.

Executive summary

To achieve this goal, the G20 is encouraged to:

I. Foster international adoption of clear ethical standards and interoperable regulatory frameworks for AI, particularly for managing high-risk applications

II. Prioritise data access and quality while advancing data free flow with trust (DFFT)

III. Support research and education focused on AI ethics and bias mitigation

Background and context

To ensure AI technologies are developed and deployed responsibly, it would be beneficial for the G20 to prioritise the alignment of ethical governance frameworks across member countries. Currently, ethical standards guiding AI, such as fairness, transparency, privacy and accountability, vary significantly between jurisdictions, resulting in inconsistent ethical outcomes and uneven protection of fundamental rights. This lack of alignment creates uncertainty around acceptable AI practices, undermining public trust and hindering equitable distribution of AI's benefits, especially to vulnerable populations.

Strategically aligning international ethical standards for AI would create a shared foundation for consistent interpretation and effective implementation of core principles globally. Clear alignment would reduce ambiguity for businesses, developers and policymakers, supporting responsible AI adoption while minimising unintended ethical risks, such as algorithmic bias and privacy intrusions. However, alignment efforts must also carefully balance ethical safeguards with flexibility, as overly rigid or prescriptive standards risk stifling innovation, limiting beneficial technological advancements and unintentionally slowing economic growth. Therefore, striking this nuanced balance is essential to fostering responsible and sustainable AI development that maximises societal benefits while preserving the agility necessary for innovation.

Alongside ethical AI development, secure and trusted data flows are foundational to responsible digital ecosystems. The G20 is encouraged to actively promote the operationalisation of frameworks like DFFT to support legally interoperable, privacy-respecting cross-border data exchange. This includes fostering mutual recognition of data protection regimes, developing standardised safeguards and supporting the creation of institutional capacity in emerging economies. Data governance and AI governance must advance in tandem to ensure public trust, innovation and human rights protection across all jurisdictions.

The G20 is encouraged to foster international adoption of clear ethical standards and interoperable regulatory frameworks for AI, particularly for managing high-risk applications.

Following the G20's reaffirmation of the 2019 AI Principles in the 2023 New Delhi Leaders' Declaration and again in the 2024 Brazil Ministerial Declaration, there is now a timely opportunity to strengthen their implementation in response to rapid technological advances and growing global challenges. To meaningfully advance international alignment on AI ethics, the G20 could initiate a process to operationalise these foundational principles through updated guidance that reflects contemporary needs. This process should be inclusive, drawing on input from governments, industry, academia and civil society to co-develop a framework that clearly articulates ethical principles such as fairness, transparency, explainability, data privacy and human oversight.

As part of this effort, the development of a common taxonomy and universally agreed-upon definitions for key ethical and operational concepts should be prioritised. This would support consistent interpretation and application, reduce ambiguity and enable coherent international governance. For example, transparency should be defined in practical terms, ensuring it protects individual rights, prevents unfair competitive advantages and upholds the public interest. Additionally, harmonising technical standards for AI systems, such as interoperability frameworks, benchmarking protocols and technical safety requirements, should be prioritised. This technical alignment would facilitate cross-border collaboration, innovation and consistent implementation of ethical principles globally.

A strong yet adaptable ethical baseline would allow countries to maintain implementation flexibility while ensuring shared global standards. To support practical implementation, the G20 could also support countries to adopt regulatory sandboxes that encourage innovative AI applications to be safely tested and refined in controlled environments, helping stakeholders navigate ethical complexities in real-world scenarios.

The G20 could also adopt regulatory sandboxes. These should be established as permanent, well-resourced policy labs that form a core component of a "smart regulation" framework. These sandboxes allow for the "bold" but supervised deployment of lower-risk AI innovations, enabling regulators and innovators to co-create agile governance solutions that foster progress without compromising on safety.

To further embed these reaffirmed principles into practice, the G20 could endorse and empower a multilateral institution, such as the OECD Global Partnership on Artificial Intelligence, to support global implementation. This body would be responsible for translating broad ethical principles into actionable, sector-specific regulatory guidelines, with a focus on high-risk AI applications in domains such as healthcare, finance and criminal justice. This means that countries should classify high-risk industries as such and regulate the use of AI in these industries more stringently. This could be implemented by adopting harmonised international risk assessment frameworks, developing sector-specific regulatory guidelines and fostering transparency mechanisms to facilitate rigorous auditing and compliance monitoring across jurisdictions.

Establishing enforceable and interoperable frameworks would promote consistency and accountability, strengthen public trust and ensure that the use of AI aligns with human rights and democratic values across diverse national and regional contexts. Governments are encouraged to co-develop AI infrastructure and safety protocols with industry. Specifically, frameworks should mandate robust mechanisms such as AI impact assessments and regular algorithmic audits, ensuring systematic oversight, transparency and accountability, particularly in sensitive areas like healthcare, finance and criminal justice.

Case study 3.1: India — G20 2023 agreement on AI ethics (India presidency)

In 2023, during India's presidency of the G20, member countries achieved a landmark consensus on guiding principles for the ethical and responsible use of AI. This marked the first time the G20 had collectively addressed AI ethics at the leaders' level and signalled a unified commitment to shaping AI's global governance. The agreement is encapsulated in the G20 New Delhi Leaders' Declaration (September 2023), which includes a dedicated section titled "Harnessing AI Responsibly for Good and for All".

At the G20 Leaders' Summit in New Delhi (9 and 10 September 2023), India's presidency introduced language on AI ethics that all leaders endorsed in the final declaration. The declaration formally affirmed that AI should be developed and used in a manner that is human-centric, trustworthy and inclusive, ensuring it "benefits humanity" and is anchored in respect for human rights, transparency, privacy and security. G20 leaders jointly committed to guard against AI's key risks by addressing issues such as bias in algorithms, lack of fairness, opacity of AI decision-making, misuse of AI (for example, in disinformation) and potential infringements on privacy.

Importantly, they reaffirmed support for the OECD's Principles on AI (which are a set of internationally agreed guidelines to promote AI that is innovative, trustworthy and respects human rights and democratic values). The declaration also referenced and upheld other relevant frameworks, like UNESCO's Recommendation on the Ethics of AI, indicating alignment with existing global standards. In terms of concrete direction, the G20 agreed to promote a "pro-innovation regulatory approach" for AI — meaning it seeks to strike a balance between fostering AI innovation and implementing regulation to mitigate harms. This implies avoiding over-regulation that stifles technological progress, while still enacting safeguards — a stance likely influenced by discussions on AI regulation in various jurisdictions (such as the EU's risk-based approach in its AI Act).

The declaration did not create a new international body, but it encouraged existing international organisations to consider AI governance and for the G20 itself to keep the topic on its agenda. Finally, the New Delhi agreement highlighted AI's role in achieving broader goals: it noted that AI's benefits should support inclusive growth and sustainable development, and that developing countries should not be left behind in the AI revolution. This was in line with India's stance of making AI a tool "for good and for all", including using AI to advance the UN Sustainable Development Goals. After the summit, India's ministers touted this achievement as a key outcome of its presidency — effectively establishing a baseline of common understanding among G20 nations on AI ethics going forward.

The G20's 2023 consensus on AI ethics teaches us that global coordination on emerging technology governance is possible, even amid geopolitical differences, when there is a shared recognition of both the opportunities and risks posed by the technology. One lesson is the power of high-level political endorsement: by getting heads of government to sign off on principles like transparency, fairness and accountability for AI, it sets a tone that filters down to national policies. Countries can point to this declaration as justification to develop their own AI regulations or frameworks aligned with these principles, knowing that it has international backing.

Case study 3.2: Brazil — G20 2024 Advancing Ethical, Inclusive and Development-Oriented AI Governance

Under Brazil's G20 presidency in 2024, the momentum on global AI governance advanced further with a focus on making AI not only ethical but also inclusive and conducive to development. Building on the prior year's consensus, the G20 discussions in 2024 emphasised practical steps to implement AI principles and to ensure AI benefits emerging economies and society at large.

A key outcome was the G20 Digital Economy Working Group's Maceió Ministerial Declaration on Digital Inclusion for All (September 2024), which included substantial commitments regarding AI governance. Additionally, in late 2024 the G20 Leaders' Summit in Rio de Janeiro carried these themes forward, aligning the world's major economies around a vision of AI that is secure, trustworthy, human-centric, and aimed at sustainable development. In essence, this was about continuity and expansion: the G20 under Brazil reinforced existing ethical AI principles (like those from India in 2023 and the 2019 OECD AI Principles) and pushed the envelope by integrating the concept of development orientation, i.e., leveraging AI to address global challenges and narrowing digital divides.

The G20 is encouraged to prioritise data modernisation while advancing DFFT.

The G20 could also actively operationalise foundational frameworks such as DFFT. Trusted cross-border data exchange is a cornerstone of the global digital economy, underpinning innovation, AI development and digital trade. Explicitly supporting DFFT would mitigate global regulatory fragmentation, encourage mutual recognition of national data protection regimes and promote the establishment of standardised data governance safeguards. Promoting interoperable legal and technical standards for trusted data exchange would enhance global cohesion in digital governance and ensure that AI-driven value chains remain inclusive and equitable.

As such, G20 countries are encouraged to operationalise DFFT, which will entail the following:

a. Fostering multilateral dialogue and collaboration to develop interoperable data governance frameworks and standards, building on existing initiatives

b. Supporting the development and adoption of practical tools for businesses to enable trusted cross-border data transfers, such as model contractual clauses and guidance on privacy-enhancing technologies

c. Providing tailored capacity-building support and technical assistance to developing countries and MSMEs to help them implement robust, DFFT-aligned data governance practices and leverage digital trade opportunities

d. Promoting transparency on national data transfer regulations through accessible repositories

In parallel, the G20 could consider encouraging a calibrated approach to data localisation — limiting these requirements to high-risk or sensitive data categories — to avoid unintended disruptions to digital innovation.

However, while frameworks like DFFT are essential, a critical foundational element still requires strengthening — ensuring widespread data access and quality. Therefore, the G20 could invest in public data repositories that provide high-quality, trustworthy data sets. This should be treated as a core strategic imperative. G20 nations are encouraged to fund the creation of curated, bias-audited data sets, particularly in local languages, to fuel a vibrant and sovereign domestic AI ecosystem. This proactive cultivation of national data assets is the essential prerequisite for developing AI solutions that are relevant, fair and tailored to local challenges. Furthermore, entities outside of government, such as multilateral organisations or private companies, could then be permitted to access public repositories for public interest-related purposes, conditional on explicit commitments to ethical and responsible data usage. This approach would both underpin and amplify the effectiveness of DFFT, enabling ethical, data-driven innovations while safeguarding the public interest.

Case study 3.3: United States and Global — Observational Health Data Sciences and Informatics

The Observational Health Data Sciences and Informatics (OHDSI) initiative is an international cross-sector collaboration designed to bring out the value of health data and innovation through the creation of shared, standardised data ecosystems. The OHDSI aims to generate accurate, reproducible and well-calibrated evidence to promote better health decisions and better care. It integrates diverse data sets from a variety of sources, including from governments, private sector entities and research institutions, by using common, interoperable data models and open-source analytical tools. This has led to high-quality, trustworthy data repositories and has enabled secure and privacy-preserving collaboration between diverse stakeholders across the globe.

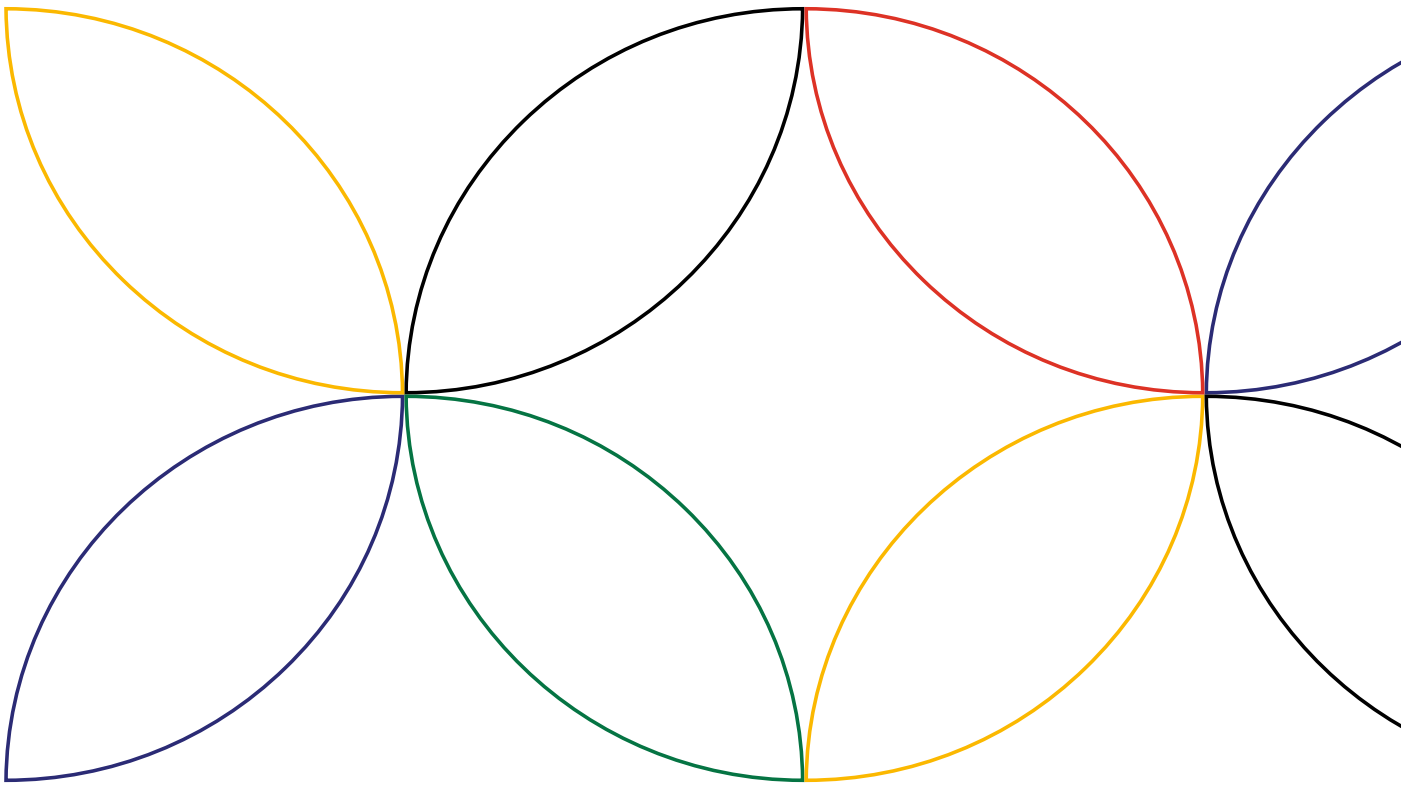
The OHDSI has had a significant impact on healthcare progress, which was particularly evident during the COVID-19 pandemic. As a public data-sharing repository, it played a critical role in monitoring the safety and efficacy of vaccines — which was used to inform clinical guidelines and public health responses worldwide.

G20 countries can learn important principles from the OHDSI's model — most importantly, the need for clear data governance frameworks, interoperable standards and commitments to ethical data use. By adopting similar models, G20 nations can promote public-private collaboration to enhanced access to data repositories and international data networks that support data quality, interoperability and confidentiality while fostering trust and innovation. Ultimately, this underpins and amplifies the effectiveness of frameworks like the DFFT.

The G20 is encouraged to support research and education focused on AI ethics and bias mitigation.

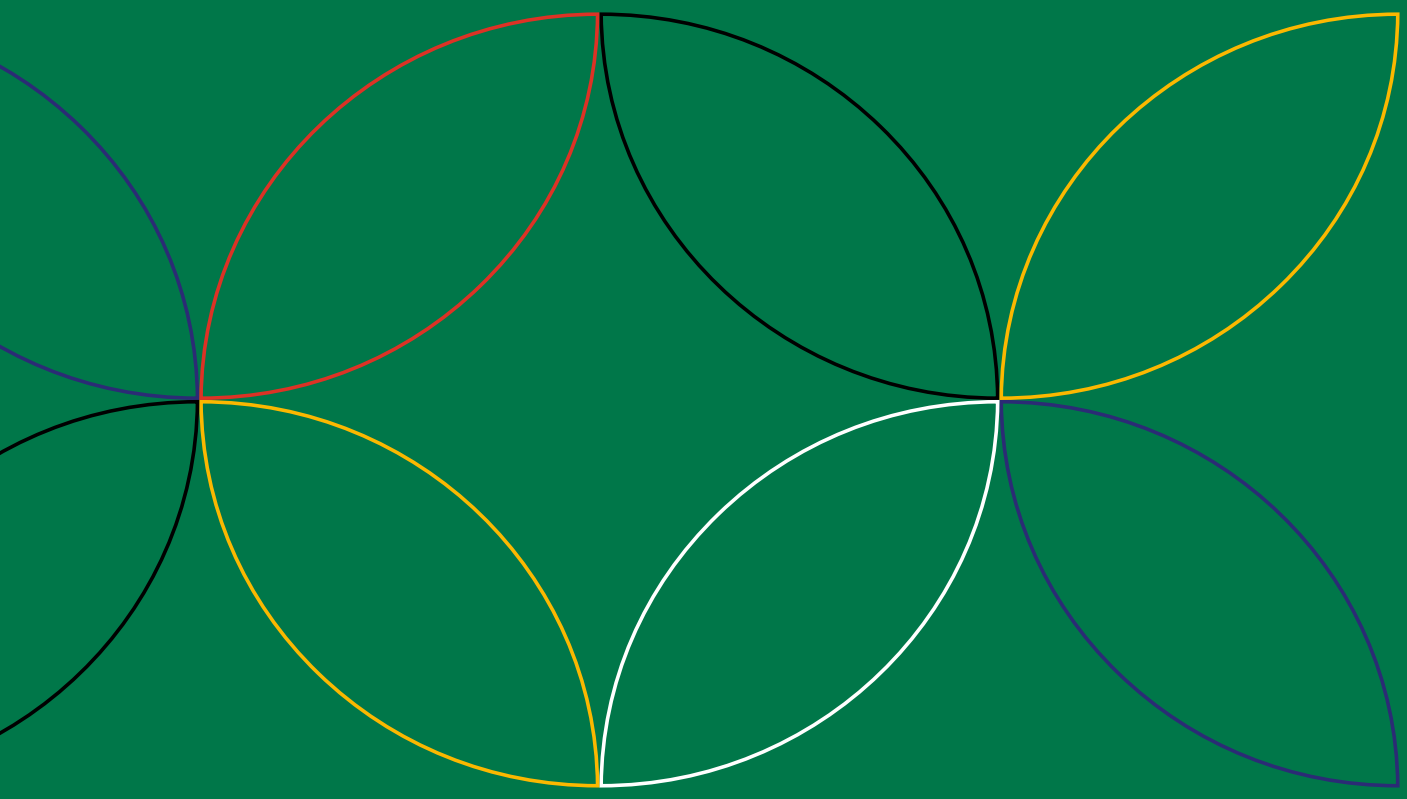
To comprehensively address AI's ethical challenges, the G20 could provide targeted funding and grants to academic and research institutions, particularly prioritising methodologies for identifying and reducing bias in AI algorithms. These research efforts should explicitly target critical areas like automation bias, which occurs when humans overly rely on AI decisions without sufficient oversight, and biases inherent in training data sets that lead to overgeneralisation and discriminatory outcomes. Special attention and dedicated funding mechanisms must be directed towards institutions in the Global South, promoting inclusive participation and ensuring that AI developments reflect diverse global perspectives and needs.

Building on Recommendation 2's emphasis on digital skills development, AI ethics must be integrated as a core component of educational curricula at universities and technical training programmes worldwide. By embedding ethical considerations into education and training, future AI developers, implementers and users will be better equipped to navigate complex ethical dilemmas and apply AI technologies responsibly. Equipping the global workforce with these essential ethical competencies will facilitate the responsible and equitable deployment of AI, significantly mitigating risks and enhancing societal trust and acceptance.



Recommendation 4

Promote secure and inclusive digital public infrastructure (DPI) ecosystems that incentivise private sector innovation and investment



Recommendation 4:

Promote secure and inclusive digital public infrastructure (DPI) ecosystems that incentivise private sector innovation and investment

Actions

Action 4.1: Develop frameworks to guide countries in designing and implementing people-centred DPI.

KPIs

Number of people who do not have a digital record of their identity

- Source: World Bank Identification for Development (ID4D)
- Baseline: 1.1 billion (2023), target: 0 (2030)
- New indicator: This KPI was introduced to directly measure progress in relation to digital inclusion, recognising that access to secure digital identities plays a foundational role for participation in digital economies and equitable access to digital services.

Number of MSMEs registered on the Global Legal Entity Identifiers (LEI) system, per 1,000 inhabitants

- Source: GLEIF
- Baseline: 0.07 (2025), target: 0.26 (2030)
- New indicator: MSMEs' integration into digital trade, and DPI more broadly, was incorporated as a key priority for B20 South Africa. This KPI highlights the importance of verifiable business identities for inclusive economic participation and efficient cross-border transactions.

Relevant G20 priorities

Recommendation 4 contributes to the priorities of the following groups:

- Engagement groups: Civil Society 20, Science 20 and Women 20
- Working groups: Development, Digital Economy and Women Empowerment

Context

In recent years, DPI has emerged as a cornerstone of inclusive digital development and a key enabler for achieving national policy goals. DPI refers to shared, core digital systems, such as digital identity platforms, payment interfaces and data exchange layers, that can be owned, governed and operated by the public sector, private sector or a PPP for public benefit.[63] These systems serve as "digital rails" on which governments, businesses and innovators can build services, much like roads and electricity grids underpin the physical economy.[64] By providing secure and reusable digital building blocks, DPI enables faster service delivery, greater inclusion and efficiency across sectors.

Since 2022, the concept of DPI has rapidly evolved from niche idea to global priority. Governments see DPI as integral to digital transformation strategies and a means to accelerate progress on the Sustainable Development Goals.[65] Multilateral consensus has grown, in 2023 the G20 group of nations formally defined DPI as:

> [...] a set of shared digital systems that are secure, interoperable, built on open standards, and provide equitable access to services at societal scale, governed by legal frameworks to promote inclusion, innovation, trust, and competition.[66]

This marked a departure from siloed, tech-led approaches of the past, towards a principles-based, human-centric vision of digital infrastructure.

There has been an explosion of global interest and coordination around DPI, elevating it to the highest policy levels. Under India's G20 presidency in 2023, DPI was a flagship theme, resulting in the first-ever G20 consensus on a DPI definition, guiding principles and cooperative measures. G20 Digital Economy Ministers agreed to promote DPI as a driver of economic inclusion and innovation, endorsing high-level principles emphasising "governance of DPI for public benefit", transparency, security and respect for human rights. The G20 Leaders' Declaration welcomed several concrete initiatives: the creation of a Global Digital Public Infrastructure Repository — a virtual library of DPI solutions voluntarily shared by countries — and the proposal of a One Future Alliance (OFA) to mobilise technical assistance and funding to help developing countries implement DPI.[67] These efforts signal that world leaders see DPI as critical shared infrastructure, akin to digital highways that should be cooperatively developed.

Momentum continued with the G20 presidency of Brazil (2024) and now South Africa (2025), which have each highlighted DPI. South Africa, assuming the current G20 chair in 2025, has set an ambitious agenda for DPI and AI as twin pillars of its presidency[68] and announced its own DPI plan.[69]

[63] World Bank Group, Publication: Digital Public Infrastructure and Development: A World Bank Group Approach, 2025.
[64] UNDP, Unpacking DPI, 2025.
[65] UNDP, Digital Public Infrastructure, 2023.
[66] WEF, What we can expect for digital public infrastructure in 2024, 2024.
[67] G20 India, G20 New Delhi Leaders' Declaration, 2023.
[68] UNDP, South Africa sets its ambitious G20 agenda for digital public infrastructure and AI, 2025.
[69] Republic of South Africa, Elevating the Delivery of Government Services, 2025.

Equipped with this international support, many developing countries are rapidly implementing DPI components or enhancing existing ones. A clear pattern is emerging: countries are not starting from scratch but learning from pioneers and often adopting proven open-source solutions for digital ID, payments and data exchange. India's "India Stack" — the open architecture underlying Aadhaar, UPI, eKYC and other services — has become a de facto reference model.[70] Several nations in Asia, Africa and Latin America have leveraged India Stack's open-source code (or similar platforms) to jump-start their own DPI initiatives. For instance, Morocco, the Philippines and Ethiopia have piloted digital ID systems based on MOSIP (an open-source identity platform inspired by Aadhaar).

Case study 4.1: India — DPI

India's DPI initiative consists of shared digital systems designed to provide secure, interoperable and equitable access to public and private services on a societal scale. Built on open standards, the DPI supports innovation, development, competition and inclusion, while ensuring human rights and privacy through established legal and regulatory frameworks.

The foundational components of India's DPI include the following:

- Identification (Aadhaar): Aadhaar is India's biometric-based digital identification system, introduced in 2009, providing each resident with a unique identification number. It facilitates secure identity verification, streamlining access to government services, financial products and welfare schemes. Aadhaar is supplemented by services such as electronic signatures (eSign) and digital verification, further simplifying transaction processes.
- Unified Payments Interface (UPI): UPI, launched by the National Payments Corporation of India in 2016, enables real-time digital payments directly between bank accounts using mobile devices. This system has expanded financial inclusion by offering accessible, secure and cost-effective digital payment solutions nationwide, including rural and remote areas.
- Data Sharing Framework (Account Aggregator (AA) system): India implemented the AA system, a consent-based data-sharing framework facilitating secure exchanges of personal financial data among regulated institutions. This system supports efficient financial services and credit assessment processes, adhering to stringent data privacy and consent management standards.

As of July 2024, Aadhaar numbers have been issued to over 1.38 billion residents, covering approximately 97% of India's population, enhancing service delivery accuracy. UPI transactions reached over 13.88 billion in June 2024 alone, with annual transaction values nearing 50% of India's nominal GDP, demonstrating broad acceptance and extensive usage in financial transactions. By March 2025, the AA framework processed approximately 179.7 million consent requests, linking over 140 million accounts, enhancing credit accessibility and financial inclusion. DigiLocker, India's platform for digital issuance and verification of

[70] USAID and eTrade Alliance, Digital Public Infrastructure: What Implications for Development and MSME Ecommerce?, 2023.

documents, supports over 300 million users with 6.75 billion issued documents. India's Direct Benefit Transfer system, leveraging DPI, facilitated the direct transfer of approximately USD 361 billion to beneficiaries across 312 government schemes, resulting in savings of USD 33 billion, equivalent to nearly 1.14% of GDP. India's DPI model has gained international recognition and has influenced global discussions, being adopted as a reference by international bodies such as the International Monetary Fund and the G20. India has signed cooperation agreements with 10 countries, including Armenia, Sierra Leone and Kenya, to share its digital solutions.

India's DPI initiative offers critical insights for countries seeking to build inclusive, scalable and secure digital ecosystems.

First, a modular and interoperable digital design anchored in open standards can drive scalability and innovation. India's DPI components, Aadhaar for identification, UPI for digital payments and the AA system for secure data sharing, are built to work seamlessly together across sectors. This approach has enabled rapid scaling, adaptability to diverse use cases and broad participation from both public and private players, fostering a vibrant ecosystem of digital services. Countries aiming to replicate this model should prioritise the establishment of open, interoperable frameworks that facilitate innovation while maintaining system integrity and user trust.

Second, strong legal, regulatory and policy frameworks are essential to ensure trust, privacy and inclusivity. India's experience demonstrates that robust data protection measures, user consent protocols and a clear governance structure can enhance public confidence and facilitate widespread adoption. By integrating safeguards for human rights and digital security, the DPI has managed to maintain a balance between innovation and accountability.

Furthermore, a focus on affordability, capacity building and international collaboration enhances accessibility and global relevance. India's emphasis on cost-effective digital solutions, such as UPI's low-cost transaction model, has made financial and government services more accessible, especially in underserved and rural communities. Parallel efforts in digital literacy, such as the Pradhan Mantri Gramin Digital Saksharta Abhiyan, have empowered citizens to utilise these services effectively. Notably, capacity building played an important role in this success. This should take place at all levels, including government, private sector and civil society.

Lastly, a key contributing factor to India's DPI success story is international collaboration. India's DPI has gained international recognition, inspiring adoption and adaptation by other nations. The signing of cooperation agreements with multiple countries exemplifies the potential for knowledge transfer and joint development of digital solutions. International collaboration can accelerate capacity building, promote best practices and ensure that digital systems are aligned with global standards for security and privacy. Countries should consider engaging in multilateral forums and bilateral partnerships to leverage global expertise and foster a resilient, interconnected digital ecosystem.

Action 4.1

Develop frameworks to guide countries in designing and implementing people-centred DPI.

Executive summary

To achieve this goal, the G20 is encouraged to:

I. Align on clear policy frameworks and institutional mechanisms that encourage responsible and competitive private sector participation in DPI

II. Support development of DPI with built-in safeguards for cybersecurity, fraud mitigation and data protection

III. Promote global use of LEIs and interoperable digital credentials to support secure and efficient digital trade

Background and context

As countries implement DPI, they are encountering common challenges and gleaning lessons about what principles and practices lead to success. The following are some of the key considerations:

a. Technology alone is not enough, DPI must be underpinned by strong laws, regulations and institutions. Because DPI systems handle sensitive personal data and critical transactions, robust privacy laws and cyber safeguards are essential to ensure public trust. Implementing DPI is as much a governance challenge as a technical one. It requires coordination across multiple parties (e.g., the ID authority, central bank, IT ministry, social sector ministries, private sector players).

b. DPI often blurs traditional roles, as it is often public sector led but meant to enable private sector innovation. Striking the right balance in the role of government versus market is a nuanced challenge. To manage this, policymakers are learning to involve private stakeholders early and co-create DPI ecosystems. Competition policy is also critical — governments must be careful that DPI does not unintentionally crowd out the private sector.

c. A practical consideration is how to fund and sustain DPI in the long run. Building DPI can involve significant upfront costs (for software development, national infrastructure, biometric devices, etc.), many of which have been covered by government budgets or development grants in early-adopter countries. The ongoing operational costs — maintaining systems, cybersecurity, customer support and updating technology — can also be substantial. Some countries treat DPI purely as a public good financed by the state, reasoning that the broad social and economic benefits (greater GDP growth, efficiency gains and financial inclusion) justify public expenditure. India, for example, has thus far subsidised UPI's operating costs so that merchants and consumers pay zero fees. However, questions arise about the sustainability of this model — India and others are exploring whether to introduce minimal interchange fees or other revenue sources to support the infrastructure without hurting usage. Likewise, several countries rely on market-based approaches and PPPs to finance, operate and continuously upgrade their DPI, unlocking private capital and innovation while preventing both state-backed monopolies and excessive market concentration. Alternatives also include hybrid models: Brazil's Pix is free for individuals but allows businesses to be

charged for certain value-added services. Another model is donor or multi-partner funding: in smaller developing nations, a combination of government funds, international grants (from the World Bank, etc.) and technical support from initiatives like OFA or Digital Public Goods Alliance (DPGA) can cover costs, at least until volume grows. Importantly, open-source DPI solutions can lower costs by avoiding software licence fees, but they still require investment in adaptation and talent. Policymakers need to plan for a business model that keeps DPI affordable and high-quality.

With global momentum on DPI at an all-time high and a wealth of knowledge available from early adopters, countries embarking on this path in 2025 are well positioned to leapfrog into a more inclusive digital future. The success of DPI largely depends on critical enablers, such as governments ensuring clear regulatory frameworks and foundational investment, private sector participation and co-creation, and robust supporting infrastructure — particularly the widespread availability of public cloud infrastructure, given its scalability and cost-efficiency. By thinking about how to implement the lessons learned above, and not risking acceleration for its own sake, governments can approach DPI in a strategic, responsible and forward-looking way. DPI is not a panacea, but when thoughtfully implemented it provides critical digital foundations that can unleash innovation, streamline governance and empower citizens.

The G20 is encouraged to align on clear policy frameworks and institutional mechanisms that incentivise responsible and competitive private sector participation in DPI.

DPI provides open platforms that level the playing field, for example, any fintech can plug into UPI, any start-up can verify identities against the national ID (with consent), which can stimulate competition and new services. However, if implemented without due regard for commercial incentives and competitive dynamics, it can unintentionally distort markets, weaken competition and deter private sector participation and investment. To manage this, governments should proactively involve the private sector, academia and civil society in their DPI plans. Governments should consult banks, fintech companies, mobile operators and tech start-ups early when developing digital payment or data-sharing platforms. They can provide insights on user needs and help drive adoption once the DPI is live, particularly by identifying barriers faced by smaller businesses. These consultations should be geared towards creating incentives that attract private sector innovation and investment, ensuring commercial sustainability.

Governments are urged to encourage the development of explicit national DPI policies and institutional arrangements that incentivise private involvement in a way that encourages secure and inclusive digital ecosystems through competition, good governance and transparency. These frameworks should explicitly address the role of supporting infrastructure, such as public cloud infrastructure, promoting transparent procurement processes and clear guidelines for usage in DPI. In doing so, governments should align these policies with established international best practices, such as the UN Universal Safeguards for Inclusive DPI framework, to ensure robust governance, safeguard individual rights and promote trust. PPP models in governance mechanisms, such as multi-stakeholder advisory boards for the DPI institutions, should be considered to ensure continued relevance and innovation. Governments should also consider specific incentives, such as tax credits, regulatory sandboxes or DPI-as-a-service models, to attract start-ups and SMEs into DPI ecosystems. Local tech developers should also be encouraged to build services on top of DPI (for instance, encourage fintech apps to use the national payment Application Programming Interface (API) or health start-ups to integrate with digital ID for patient verification). The use of other technologies, such as AI and Model Context Protocol

are crucial for realising the potential of DPI, as this can provide the foundation for simpler, effortless and non-siloed participation in DPI. This may involve evangelising the potential of DPI, providing sandbox environments or hackathons, performance-based procurement tied to social outcomes and ensuring fair access (no exclusive contracts that shut out competitors). Moreover, reducing regulatory fragmentation, which currently costs the global economy approximately USD 5.7 trillion annually, should be a priority, emphasising the importance of coordinated international frameworks.[71] Civil society and digital rights groups should also have a voice — they can help identify privacy or inclusion issues and keep the focus on the public interest. Ultimately, DPI will thrive if it's seen as a shared national platform with many contributors, rather than a government-only system. To support this, the G20 could task the World Bank to develop a methodology to assess the quality and intensity of private sector participation in DPI ecosystems. This assessment should capture participation across three layers:

a. In the deployment and delivery of DPI systems

b. In adjacent markets shaped or enabled by DPI

c. In the overlay services and applications built on top of DPI platforms

Additionally, DPI frameworks should explicitly address the role of supporting infrastructure, such as public cloud infrastructure, promoting transparent procurement processes and clear guidelines for usage in DPI. By leveraging the scalability and efficiency of the cloud, nations can accelerate the deployment and enhance the resilience of their DPI systems.

A clear, evidence-based understanding of private sector participation will support policy decisions that preserve public value while encouraging vibrant market participation.

The G20 is encouraged to support development of DPI with built-in safeguards for cybersecurity, fraud mitigation and data protection.

Trust in DPI begins with its architecture. Governments are encouraged to prioritise embedding safeguards within the foundational design of DPI systems rather than treating them as afterthoughts. This includes applying security-by-design and privacy-by-design principles, which ensure that threats to users and the infrastructure itself are identified and mitigated proactively. Techniques like zero-trust architectures, end-to-end encryption, differential privacy, zero-knowledge protocols and robust access controls should be standard practice in DPI deployments.

Additionally, public digital systems must include clear accountability mechanisms for risk management. National cybersecurity strategies should explicitly include DPI, supported by regular audits, threat intelligence sharing and independent oversight. Strong protection against identity theft, data misuse and digital fraud is essential to maintaining user trust and operational resilience, particularly in high-volume systems such as digital payments and identity verification.

These safeguards also enable regulatory compliance, including alignment with data protection laws and financial regulations. As DPI scales and becomes integrated across sectors and borders, these technical and procedural defences will be essential to managing systemic risks and securing user participation, particularly from marginalised populations often most vulnerable to harm.

[71] WEF, Navigating Global Financial System Fragmentation, 2025.

To operationalise these safeguards, the governments should take concrete steps including the following:

a. Adopt baseline cybersecurity and privacy standards for DPI, aligned with international frameworks (e.g., NIST, ISO/IEC 27001)

b. Mandate that DPI-funded initiatives through multilateral institutions incorporate independent security audits and risk assessments

c. Task the Global Forum on Cyber Expertise to develop DPI-specific cybersecurity guidelines

This would help ensure that DPI systems are not only trusted by design but also resilient in practice, safeguarding public confidence, enabling safe innovation and protecting the most vulnerable users across the digital economy.

The G20 is encouraged to promote global use of LEIs and interoperable digital credentials to support secure and seamless digital trade.

Inclusion is not only a citizen-side imperative — it must also extend to businesses, especially MSMEs, to enable equitable participation in the digital economy. As governments invest in DPI to serve individuals, there is an equally urgent need to ensure that the private sector — particularly MSMEs — can participate fully and fairly in digital trade ecosystems. This means ensuring businesses have access to trusted, verifiable digital identities that encourage them to interact seamlessly across borders, access finance and comply with digital regulations. LEIs, a global standard developed by the G20, offer a scalable solution. When integrated into national business registries and digital platforms, LEIs can simplify entity verification, reduce fraud and empower MSMEs to plug into digital trade networks on equal footing with larger firms. In this context, LEIs are not just a tool for transparency — they are a lever for economic inclusion, unlocking opportunities for smaller enterprises to compete and thrive in global supply chains.

a. First, G20 members could scale adoption of interoperable digital identity systems for legal entities. The global LEI system, launched by the G20 a decade ago, remains underused outside financial sectors. Expanding LEI adoption across trade ecosystems, including MSMEs, would simplify company authentication, reduce fraud and enable streamlined verification in customs, logistics, finance and procurement. LEI can also be more useful if it's linked to sustainable finance reporting, e-invoicing systems, cross-border trade and supply chain tracking tools. Countries should integrate LEI issuance into national business registries and promote LEI-based APIs across digital trade platforms. These use cases can help the LEI move beyond just regulation and become a tool for better transparency, trust and digital trade.

b. Second, the adoption of interoperable data standards is essential for trade information to flow seamlessly across jurisdictions and digital systems. Currently, the lack of standardised data structures is a major barrier to scaling technology solutions and eliminating unnecessary trade friction. The G20 should endorse and support the ICC Digital Standards Initiative, which works alongside the WTO and International Organisation for Standardisation (ISO) to define and promote globally accepted data standards. A coordinated commitment to accelerate adoption across public and private stakeholders would provide a clear signal to markets and technology developers. Smart contracts, as open-source and transparent automation tools, offer an example of a

neutral and auditable mechanism that could securely facilitate information flows between independent LEI implementations.

c. Third, the G20 could call for the alignment of national legal frameworks with the UNCITRAL Model Laws: the Model Law on Electronic Commerce (MLEC), Model Law on Electronic Signatures (MLES) and Model Law on Electronic Transferable Records (MLETR). These instruments create the legal foundation for paperless trade, e-signatures and the recognition of digital documents such as bills of lading. While the UN, WTO, G7 and the Commonwealth have expressed commitments to these standards, the G20 has not yet done so. A declaration committing G20 members to best endeavours to remove legal barriers to trade digitalisation and align national laws to MLEC, MLES and MLETR would be both timely and impactful, and consistent with broader efforts to reduce regulatory fragmentation.

These three actions, scaling LEI adoption, standardising cross-border data flows and aligning legal frameworks, are not merely technical upgrades, they are structural enablers of inclusive economic participation. By reducing friction, building trust and making digital trade infrastructure accessible to firms of all sizes, they ensure that MSMEs are not locked out of the global digital economy.

The task for policy-makers now is to prioritise foundation reforms that are technically feasible and already validated by early adopters. Implementing LEIs at scale, adopting common data standards and aligning legal frameworks with established international norms are not distant aspirations; they are readily actionable measures that can deliver tangible benefits in the near term. By focusing on these areas, G20 governments can lay the groundwork for more inclusive, efficient and trusted digital trade systems. This would send a clear signal to markets and businesses alike that digital transformation is not just for the few, but for all.

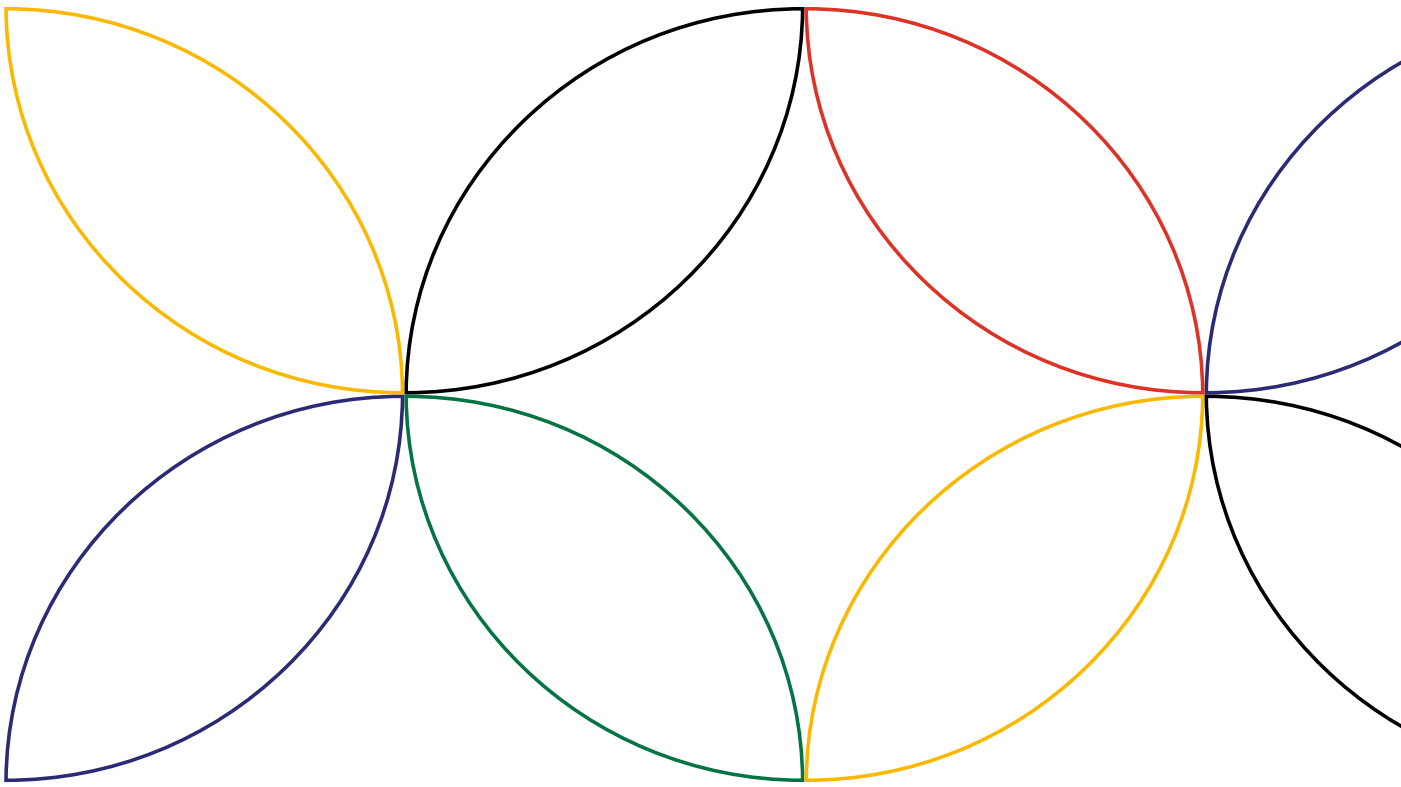
Case study 4.2: GLEIF's LEI for inclusive digital business identity

The LEI is a 20-character alphanumeric code that uniquely identifies legal entities (such as companies, nonprofits, financial institutions) engaged in financial transactions. Global Legal Entity Identifier Foundation (GLEIF), established in 2014 by the G20's Financial Stability Board, oversees the global LEI system, which was initially created to improve transparency in financial markets after the 2008 crisis. Today, over 2.5 million entities across more than 220 jurisdictions have obtained LEIs. Traditionally, LEIs have been used mainly for regulatory reporting in banking and capital markets — for example, they are required for all parties in EU securities trades. The case study highlights GLEIF's recent initiatives to broaden the LEI's utility beyond its original scope, particularly through digital and verifiable LEIs (vLEIs) and partnerships focused on financial inclusion. By doing so, GLEIF aims to provide a trusted digital identity for businesses of all sizes, which can streamline processes like know-your-customer compliance, cross-border payments and access to trade opportunities for MSMEs.

GLEIF's work in recent years has two notable thrusts: technological innovation with the verifiable LEI and strategic partnerships to embed LEIs in digital finance ecosystems.

- In 2021-2022, GLEIF developed a framework for a cryptographic version of the LEI that can be instantly authenticated online. A vLEI is essentially a digital credential (often in the form of a digitally signed certificate or token) that any organisation can present to prove its identity and key details (like its official name, registration and ownership structure) in a secure, machine-verifiable way. To create this, GLEIF collaborated with experts in decentralised identity and blockchain. In early 2023, GLEIF published the vLEI Ecosystem Governance Framework, which sets out how vLEIs are issued and managed. Pilot programmes soon followed: for instance, banks and trading platforms tested vLEIs for onboarding clients, where instead of sending notarised documents, a company could use a vLEI to cryptographically prove "who it is" online. The vLEI is particularly useful for automating verification in digital transactions, e.g., an SME applying online for a loan can present its vLEI to the lender's system, which automatically checks the credential against GLEIF's global LEI database to confirm the company's identity and legitimacy. This dramatically cuts down manual checks and the need for multiple documents. It also enhances security: a vLEI is tamper-evident and traceable to GLEIF as the root of trust, reducing the risk of fraud.
- Acknowledging that many small businesses and entities in developing countries lack any globally recognised ID, GLEIF has reached out to align the LEI system with financial inclusion efforts. A significant step came in May 2025, when GLEIF joined the Mojaloop Foundation's Global Partner Program. (Mojaloop is an open-source payment platform aimed at expanding digital financial services in emerging markets.) By signing a memorandum of understanding with Mojaloop, GLEIF committed to work on integrating LEIs into payment systems — specifically to improve the routing of payments to the correct recipients by using LEIs as identifiers for businesses and merchants. If every merchant or small business in a payment network had an LEI (or vLEI), cross-border payments or inter-bank transfers could more reliably reach the intended entity, reducing errors and compliance delays. This partnership also involves linking LEIs with merchant digital identities in mobile money ecosystems, which could help small shops establish credit histories and trust with banks.

GLEIF's efforts demonstrate how a global standard, initially designed for a narrow regulatory purpose, can evolve to serve broader digital economy goals. One lesson is the adaptability of open standards: by creating the vLEI as an extension of the LEI system, GLEIF preserved the trust and uniqueness of the LEI code but updated it for the era of decentralised digital identity. Other standard-setters can take note that making technical standards "digital-friendly" (e.g., enabling automated verification) significantly increases their utility and uptake in an age of APIs and instant transactions. The push for inclusive usage of LEIs also underscores the importance of interoperability between identity systems. GLEIF's collaboration with Mojaloop, MOSIP and others highlights that solving financial inclusion isn't just about giving people IDs or businesses IDs in isolation but making sure these systems work together across borders and sectors. If an SME in one country can use its LEI to smoothly register on a foreign e-commerce platform or apply for financing abroad, that's a big win for reducing friction in international commerce for small players. Thus, a key takeaway is that global identifiers like LEIs can act as "equalisers" — levelling the playing field by giving even the smallest entities a recognised identity in the global marketplace.



Annexure A: Task force composition

Distribution of Members by country

Country	#
Argentina	3
Australia	1
Belgium	2
Brazil	3
Canada	4
China	7
Denmark	1
Egypt	1
Finland	4
France	7
Germany	3
Ghana	2
India	17
Indonesia	4
Ireland	1
Italy	7

Country	#
Japan	4
Republic of Korea	1
Lebanon	1
Netherlands	1
Nigeria	5
Russian Federation	13
Saudi Arabia	2
Singapore	2
South Africa	74
Spain	3
Sweden	1
Switzerland	2
United Arab Emirates	1
United Kingdom	17
United States	38

Distribution of Members by gender

Gender	Count
Female	75
Male	157

Task Force Chair

Name	Organisation	Position	Country
Phuthi Mahanyele-Dabengwa	Naspers	CEO	South Africa

Task Force Deputy Chair

Name	Organisation	Position	Country
Bassim Haidar	BH Holdings Group	CEO	United Kingdom

Task Force Co-Chairs

Name	Organisation	Position	Country
Charles Murito	Google	Regional Director — Sub-Saharan Africa, Government Affairs and Public Policy	Kenya
Lord Karan Bilimoria	ICC UK	Chair	United Kingdom
Kate Purchase	Microsoft	Senior Director for International AI Governance	Canada
Lauren Dreyer	Starlink	Vice President of Business Operations	United States
Ling Hai	Mastercard	President for APAC, EMEA	United Kingdom

Name	Organisation	Position	Country
Sir Mohamed Mansour	Mansour Group	Chair	United Kingdom
Segun Ogunsanya	Airtel Foundation	Chair	Nigeria
Shameel Joosub	Vodacom	Group CEO	South Africa
Smriti Irani	AGG-GEE	Chair	India
Shalini Khemka	E2Exchange	Founder and CEO	United Kingdom

Task Force Special Advisers

Name	Organisation	Position	Country
Avi Lasarow	Finergi	Group CEO and Co-founder	United Kingdom
Kgothatso Baloyi	RMB	Electronic Liquidity Lead	South Africa

Task Force Members

Name	Organisation	Position	Country
Abbas Lightwalla	IFPI	Director of Global Legal Policy	United Kingdom
Abdul Moutie Abrahams	Greater Translogic Advisory Services	Director	South Africa
Abongile Mashele	Google SA	Head of Government Affairs and Public Policy — South Africa	United States
Ahmed Kouther	Mind Stream Group	CEO	Saudi Arabia
Alastair Charles Tempest	Ecommerce Forum of South Africa NPC	CEO	South Africa
Aleksandr Dolganov	Bank Center-invest	Deputy Chair of the Executive Board	Russian Federation

Name	Organisation	Position	Country
Alexander Voynovskiy	Gazprom Neft PJSC	Head of Enterprise Architecture Department	Russian Federation
Alexandra Krivosheeva	Sberbank	GR Manager	Russian Federation
Ali Mazanderani	Lesaka Technologies	Executive Chair	South Africa
Alistair Tebbit	RELX	Head of International Programs	United Kingdom
Alix Jagueneau	GSMA	Head of External Affairs	United Kingdom
Ambre Naija	Novambre Consulting	CEO	France
Andrei Neznamov	Sberbank	Managing Director — Center of Human-Centric AI	Russian Federation
Andrey Filippov	Digital Economy ANO	Deputy Director	Russian Federation
Andriei Gutierrez	Brazilian Software Association — ABES	Vice President	Brazil
Anne Claire Hoyng	Prosus	Global Head of Competition Policy	Netherlands
Anne Makena	Africa Oxford Initiative, University of Oxford	Co-director	United Kingdom
Anne Therese Clayton	JSE Ltd	Group Head — Public Policy and Regulatory Affairs	South Africa
Anoushka Marie Marthe Alexandre	Ernst & Young	Director — Strategy and Innovation	United States
Aparna Balram	Bigsoft Technologies	CEO	India
Apratim Mukherjee	UNOPS	Change Management Specialist	Denmark

Name	Organisation	Position	Country
Apurva Anand	Tata Digital Pvt Ltd	Head — Partnerships and Strategic Alliances	India
Arian Siefert	DIHK	Director of Digital Economy	Germany
Ariela Zanetta Simoni	TOTVS	Executive Manager	Brazil
Arshish Kavarana	Colliers	Senior Executive Director — Occupier Consulting & Digital	India
Arthur Antunes Monteiro Moura	Independent		United States
Arun Karna	AT&T Global Network Services India Pvt Ltd	MD and CEO	United States
Arun Varughese	RMB	Sector Head — Technology, Media and Telecommunications	South Africa
Ashley Haruka	CEAJ	Project Manager	Japan
Ashley Singh	Sanlam	Chief Information Officer — Sanlam Health and Corporate	South Africa
Ashona Kooblall	iOCO Limited	Group Chief Financial Officer	South Africa
Aster Antony Kaitharath	Fospe Software Pvt Ltd	CEO	India
Audrey Mothupi Palmstierna	Systemiclogic Group	CEO	South Africa
Ayman Essam	Vodafone Egypt	External Affairs and Legal Director	South Africa
Bahar AlHarbi	Startups House	CEO	Saudi Arabia

Name	Organisation	Position	Country
Bankole Olalekan	Extrafin Advisory Technologies-Extramile Africa	CEO	Nigeria
Belinda Rathogwa	Standard Bank	Head of Digital and eCommerce	South Africa
Ben Burge	Quantum Fusion Network	Quantum Fusion Advisor, Board Member	Canada
Benny Thobejane	Nina Jojer Limited	Government Affairs and Client Management Lead — South Africa	Nigeria
Beverley Schafer	Strat Diplomacy Advisors	Consultant	South Africa
Bramley Maetsa	Sasol	Digital Innovation Enablement Lead	South Africa
Bryan Adriel Hartoman Saragih	World Bank	Government Analytics	Indonesia
Busisiwe Khaba	Amazon Web Services	Regional Head of Public Policy: Economic Policy and Regulation — Africa, Middle East and Türkiye	United States
Cameron McKenzie	McKenzie & Associates	Founder and CEO	United States
Candace Johnson	Seraphim Space Fund	Partner	United Kingdom
Carlos Zarco Alonso	Fundación Espriu	General Director	Spain
Charis Jenkins	SBA Communications Corporation	Senior Manager — Government and Regulatory Affairs	United States
Chenxing Lyu	DHgate Group	Marketing Manager	China

Name	Organisation	Position	Country
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Christian Hoffmann	Siemens AG	Global Head of Geopolitics and International Relations	Germany
Christoph Nieuwoudt	FirstRand	Chief Data and Analytics Officer	South Africa
Clayton Naidoo	Google	Director — Strategic Missions and Partnerships	South Africa
Collins Ogundipe	Royal Canadian Mounted Police	AI and Software Solutions	Canada
Diane Wang Shutong	DHgate Group	Founder, Chair and CEO	China
Divyanshu Varshney	VR AR MR	President	India
Donald Valoyi	Zulzi	CEO	South Africa
Dr Bienvenu Agbokponto Soglo	Intel Corporation	Director — Government Affairs Africa and IGA CTO Liaison	United States
Dr Brahim Ghribi	Nokia	Head of Government and Policy Affairs — MEA	Finland
Dr Catherine Lephoto	BitMobile (Pty) Ltd	Director — Global Partnerships	United States
Dr Naledi Gallant	nnakki	Founder and CEO	South Africa
Dr Nick Bradshaw	South African AI Association	Chair	South Africa
Dr Shuktij Singh Rao	Singhania and Co LLP	Director — Regulatory and	India

Name	Organisation	Position	Country
		Government Relations	
Duke Mpapele	African Proficient Group	Executive Chair	South Africa
Dylan Piatti	Advantage Group International	Managing Director — Africa	Canada
Eckart Zollner	Digital Parks Africa	Head of Business Development	South Africa
Eduardo Salido Cornejo	Amadeus	Senior Advisor — Industry and Government Affairs	Spain
Ekow Duker	The AI Shop Inc	Co-founder and CEO	United States
Elena Williams	Connected Places Catapult	Director — Government and Global Engagement	United Kingdom
Emmanuel Adofo Marih	Ocelot Systems Ltd	CEO	Ghana
Emmanuel Lubanzadio	OpenAI	Africa Lead	United States
Evgenii Charkin	JSC Russian Railways	Deputy CEO	Russian Federation
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Felix Omaghomi	Compasse Network Limited	Director	Nigeria
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Franco Martino	Almawave SpA	International Business Director	Italy
Gabriele Provana	Eni SpA	Head of Digital IT Governance and Strategy	Italy
Gianluca Diana	Lenovo	Manager — Government Relations EMEA	China
Guillermo Pivetta	eNOTUS International Inc	Innovation and Digital Transformation Managing Director	United States
Gustavo Braz Carneiro	smartBOX — Safe Transport and Storage/BRZ Consulting/IBERSA	Founder/CEO	Brazil
Gwen Ngwenya	Mastercard	Vice President — Public Policy	South Africa
Hannah Redders	Data for Change — The PARIS21 Foundation	Executive Director	Switzerland
Holger Bingmann	Thinking Arabian GmbH	Managing Partner	Germany
Hon Chukwuemeka Ujam	NINA JOJER	Managing Partner	Nigeria
Husani Durans de Jesus	Information Technology Industry Council	Director of Policy	United States
Hywel David George	Old Mutual Investments	Director of Investments	South Africa

Name	Organisation	Position	Country
James David	Tata Consultancy Services	Head — Business Development	India
Jan Liebenberg	Nokia	Chief Technology Officer — Southern and Eastern Africa	Finland
Jason Patchay	MetaPOS	Founder and CEO	South Africa
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John Mathwasa	Offramp Capital	CEO	South Africa
Juan Luis Redondo Maillo	TELEFONICA S.A.	Director — Digital Public Policy	Spain
Juanita Clark	Digital Council Africa	CEO	South Africa
Kantikumar Dugar	MediaJade	Chief Ninja/Founder	India
Kapil Jain	Monkhub Innovations Private Limited	CEO	India
Karim Kobeissi	Kobeissi & Frangie — Attorneys & Counselors at Law	Managing Partner	Lebanon
Katharina Pillay	South African Communications Forum	Managing Director	South Africa
Kavitha Prag	Deloitte Africa	Director — Enterprise Technology	South Africa
Kgopotso Riba	Xiquel Group	Managing Director	South Africa
Kgosietsile Mogotsi	South African Breweries	Director — Government Affairs and Stakeholder Relations	South Africa

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Khosi Phasha Radebe	kHAVHO	Marketing and PR Director	South Africa
Kirill Sergashov	Avito	Head of Government Relations	Russian Federation
Koh Nakajima	Keidanren (Japan Business Federation)	Co-director	Japan
Kuben Naidoo	Investec Bank Limited	Head — Corporate Payments	South Africa
Kyle Johnson	Information Technology Industry Council	Director of Trade Policy	United States
Lakshmi Sai Kumar Dampanaboina	Lakshmi LLC USA Global Economic Impact Forum A Think Tank, Partimer Inc	CEO	United States
Lamia Riabi	T3i Partner Network	Partner Consultant	United Kingdom
Lariana Mungai von Atzingen	Kuaishou Technology	Head — Government Affairs and Public Policy for Brazil	China
Larry Donnell Yon II	Cyber Alliance Consortium, LLC	Co-founder and President	United States
Laura Takamizawa	International Federation of Accountants (IFAC)	Principal	United States
Lebogang Mokgabudi	Pan-African Payments Settlements System	Board Director	Egypt
Lebusa Meso	ENSAafrica	Corporate Lawyer (M&A)	South Africa

Name	Organisation	Position	Country
Lesego Charlie	Youth Chamber	Head of Communications	South Africa
Lincoln Mali	Lesaka Technologies	CEO	South Africa
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Lovemore Mazungunye	Baker Tilly Ireland	Manager — Assurance: Digital Assets	Ireland
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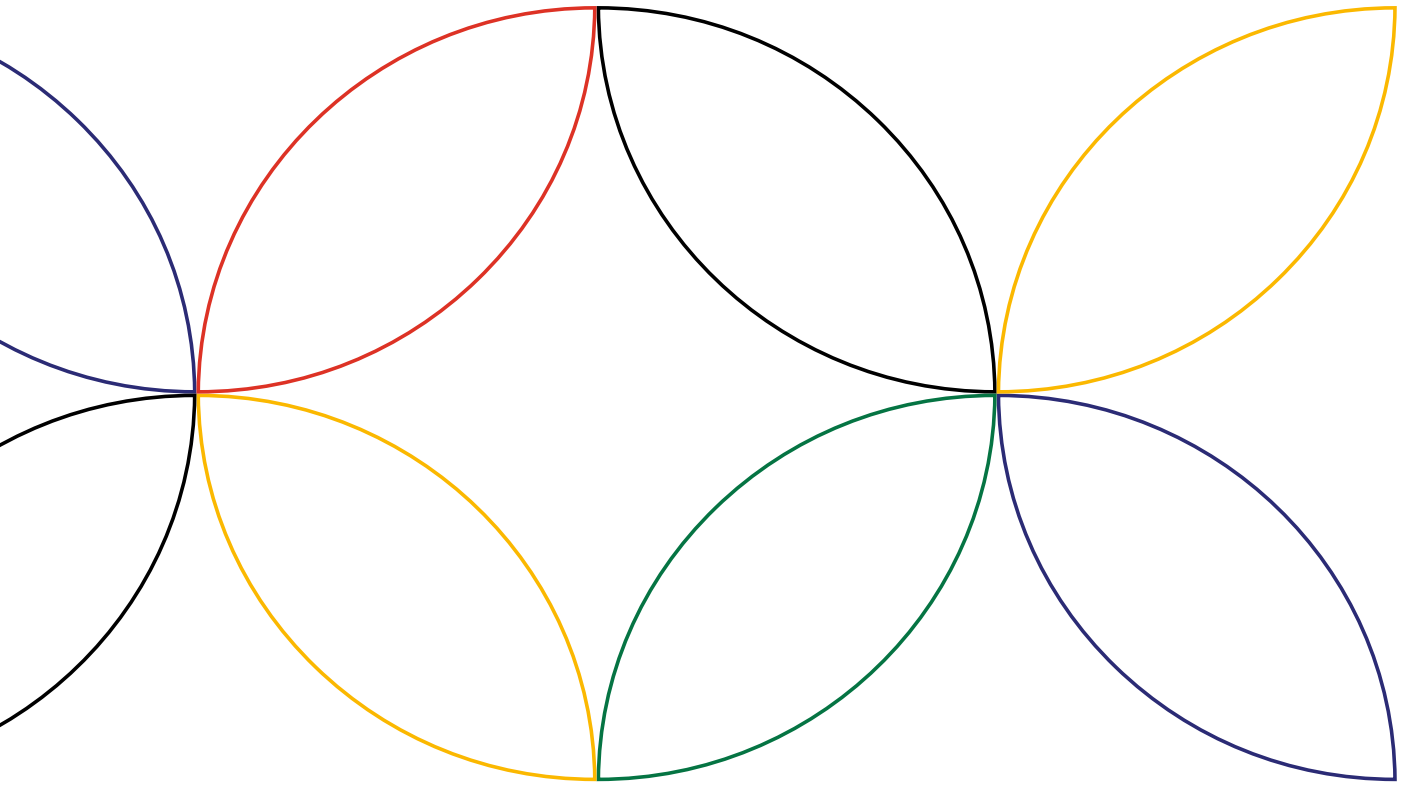


Annexure B: Relevant B20 South Africa guiding claims

Recommendation 1

Recommendation 1 has the strongest impact on two B20 South Africa guiding claims:

- Unlock inclusive growth and enable widespread economic participation: Expanding high-speed internet infrastructure and increasing connectivity (Action 1.1) provides underserved and underrepresented communities with access to vital services, such as education, healthcare and employment. Additionally, localised connectivity initiatives (Action 1.2) also allow MSMEs to participate more meaningfully in the digital economy, leading to more widespread economic participation.
- Drive industry reforms to build resilience into global and regional supply chains: Robust digital infrastructure (Action 1.3) substantially improves supply chain resilience on both a regional and global level. This is primarily due to better connectivity that facilitates digital trade and ultimately efficient, secure cross-border transactions.

Recommendation 2

Recommendation 2 has the strongest impact on three B20 South Africa guiding claims:

- Invest in human capital and re-energise a thriving skills market: Prioritising digital education and training (Action 2.1) aligns the workforce with industry demands, ensuring skills remain relevant and adaptable. Initiatives such as educator training, curriculum modernisation and industry collaborations (Action 2.2) directly enhance human capital and improve employability in a digital economy.
- Unlock inclusive growth and enable widespread economic participation: By ensuring universal access to foundational digital skills (Action 2.1), individuals and MSMEs gain capabilities crucial for economic empowerment and productivity. Digital skills training fosters inclusive participation, allowing broader segments of society to contribute meaningfully to the digital economy.

Recommendation 3

Recommendation 3 has the strongest impact on two B20 South Africa guiding claims:

- Invest in human capital and re-energise a thriving skills market: Supporting research and education on AI ethics and bias mitigation (Action 3.1) builds the necessary ethical and technical capabilities within the workforce. Aligning AI governance frameworks internationally ensures equitable access to AI-driven opportunities, enhancing human capital across diverse socioeconomic groups.
- Unlock inclusive growth and enable widespread economic participation: Establishing a coherent, accountable AI governance framework (Action 3.1) mitigates risks such as algorithmic bias, privacy infringements and unfair competitive advantages. Ethical, human-centric AI deployment promotes inclusive growth, ensuring the benefits of technological advancements reach all sectors of society.

Recommendation 4

Recommendation 4 has the strongest impact on two B20 South Africa guiding claims:

- Unlock inclusive growth and enable widespread economic participation: The development of secure and inclusive DPI (Action 4.1) fosters equitable access to digital services and economic activities. Supporting frameworks for private sector participation enhance the inclusivity and efficiency of digital trade, empowering MSMEs and marginalised communities.
- Drive industry reforms to build resiliency into global and regional supply chains: Adopting global interoperable standards, such as LEIs (Action 4.1), eases cross-border transactions and improves transparency. At the same time, this mitigates risks pertaining to global and regional supply chains.

Annexure C: Relevant G20 South Africa priorities

Recommendation 1

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

- Connectivity for inclusive digital development: Expanding internet infrastructure and local connectivity (actions 1.1, 1.2 and 1.3) ensure inclusive digital participation.
- Digital innovation ecosystems (MSMEs): Enhancing digital infrastructure empowers MSMEs to leverage digital opportunities.

It also aligns with the Research and Innovation Working Group through supporting open innovation and greater accessibility.

Recommendation 2

Recommendation 2 supports the Education Working Group and Employment Working Group in the following manners:

- Inclusive economic growth and youth employment: Digital skills training (actions 2.1 and 2.2) promotes inclusive economic growth and youth employability.
- Digitalisation and inclusive future of work: Aligning education with digital market demands fosters workforce adaptability.

Recommendation 2 also aligns with digital innovation ecosystems for MSMEs under the Digital Economy Working Group.

Recommendation 3

Recommendation 3 contributes to the Digital Economy Working Group as follows:

- Equitable, inclusive and just AI: Promoting accountable AI governance frameworks (Action 3.1) works towards ethical and inclusive AI deployment.

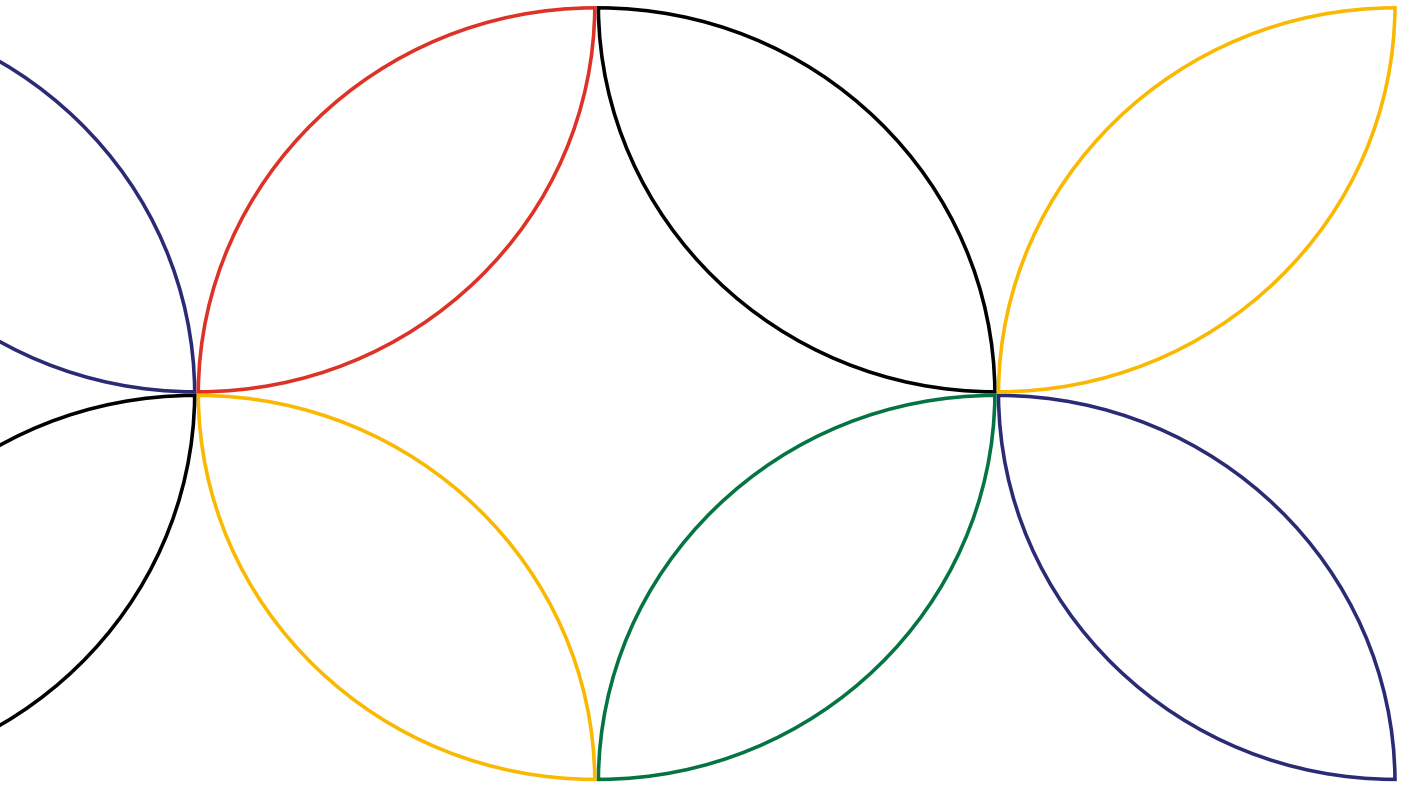
It further supports the Research and Innovation Working Group in fostering diversity and equity in AI development.

Recommendation 4

Recommendation 4 aligns with the following Digital Economy Working Group priorities:

- DPI and transformation: Encouraging secure DPI (Action 4.1) for innovative, inclusive digital services.
- Digital innovation ecosystems (MSMEs): Adopting standards like LEIs enhances digital trade efficiency for MSMEs.

It also supports the Employment Working Group priorities in inclusive growth and digitalisation, enhancing global supply chain resilience.



Annexure D: Linking actions to KPIs

KPI 1.1: Population not using the internet

KPI 1.2: Fixed broadband affordability for low-income countries (5 gigabyte data as percentage of gross income)

KPI 1.3: Percentage of smartphone ownership

KPI 2.1: Percentage of individuals without any digital skills

KPI 2.2: Percentage of countries offering CS-related education

KPI 2.3: Percentage of MSMEs using enterprise technology

KPI 3.1: Percentage of individuals reporting trust in AI systems

KPI 3.2: Average government AI readiness score

KPI 4.1: Number of people who do not have a digital record of their identity

KPI 4.2: Number of MSMEs registered on the global LEI system

Recommendation 1

Action 1.1 directly improves the percentage of the population not using the internet (KPI 1.1) by closing coverage gaps through expanded high-speed, last-mile internet infrastructure in underserved areas, thus significantly increasing internet access.

Action 1.2 further enhances KPI 1.1 by fostering localised connectivity solutions in rural and low-income areas. This action simultaneously improves the affordability of broadband (KPI 1.2) by stimulating competition, thus driving down internet costs for underserved populations.

Action 1.3 directly impacts the percentage of smartphone ownership (KPI 1.3) by scaling up mobile device affordability, and thus accessibility. It also indirectly supports KPI 1.1, as increased smartphone ownership significantly facilitates greater internet usage among previously unconnected groups.

Recommendation 2

Action 2.1 contributes to the improvement of KPI 2.1 by embedding foundational digital literacy and skills within educational curricula and targeted training initiatives. Furthermore, it improves KPI 2.2 through the integration of digital and computer science-related skills into national education programmes. Lastly, KPI 2.3 is also indirectly supported in that the workforce, including MSMEs, are equipped with essential digital competencies.

Action 2.2 improves both KPI 2.1 and KPI 2.2 through the modernisation of curricula to incorporate advanced digital and AI skills and aligning tertiary education institutions with the demands of industry. Additionally, this alignment contributes to the improvement of KPI 2.3, since graduates are better equipped to adopt and effectively utilise enterprise technology platforms within MSMEs.

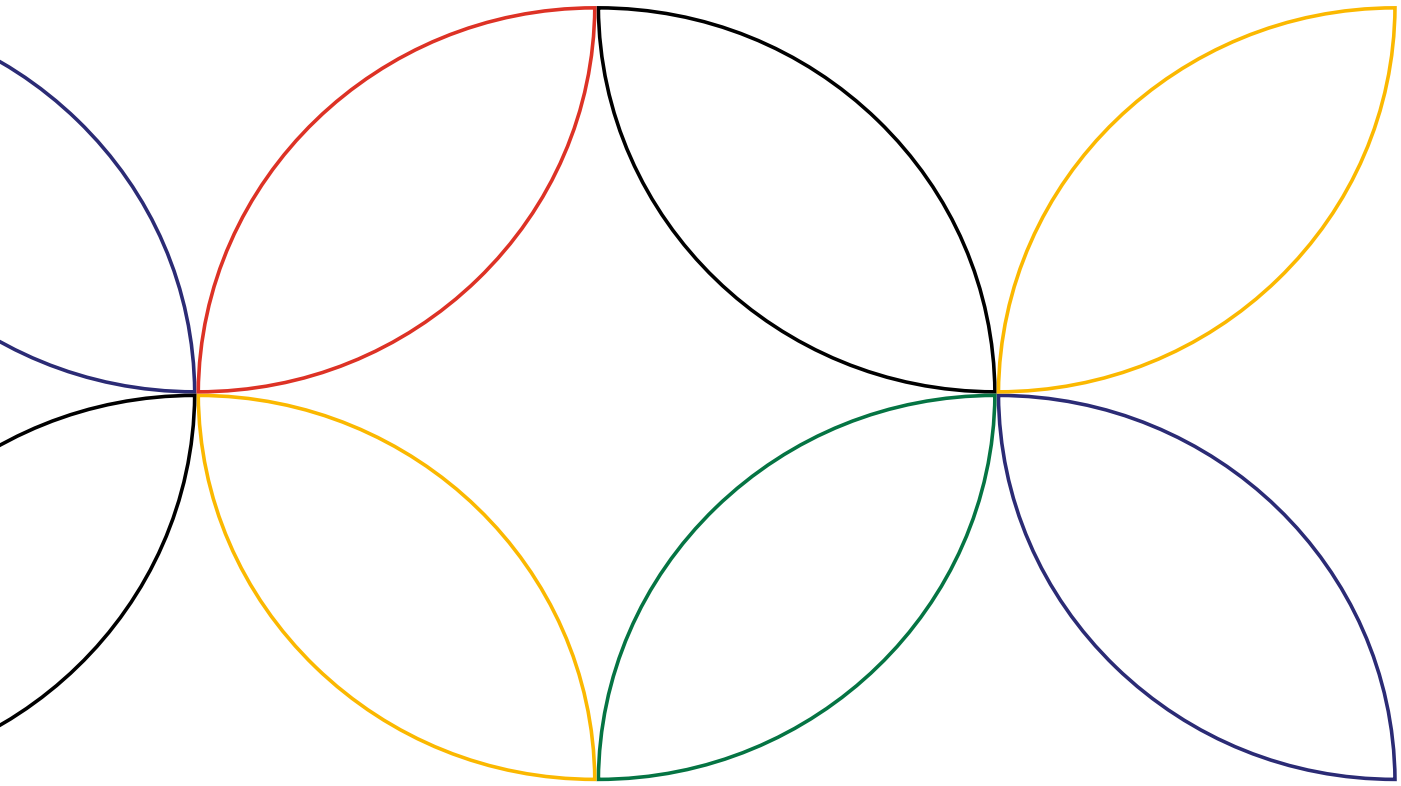
Recommendation 3

Action 3.1 positively impacts KPI 3.1, since fostering trustworthy, transparent and ethical AI systems through international alignment indirectly bolsters public confidence and trust in the use of AI. Additionally, Action 3.1 directly contributes to KPI 3.2 by aligning countries to a coherent and accountable governance framework — this enhances regulatory clarity and institutional preparedness.

Recommendation 4

Action 4.1 directly reduces the number of people without a digital record of their identity (KPI 4.1) by supporting frameworks and mechanisms for secure, inclusive and trusted DPI. This encourages the adoption of digital identity systems, enabling broader access to verifiable identity records, particularly benefiting previously excluded populations.

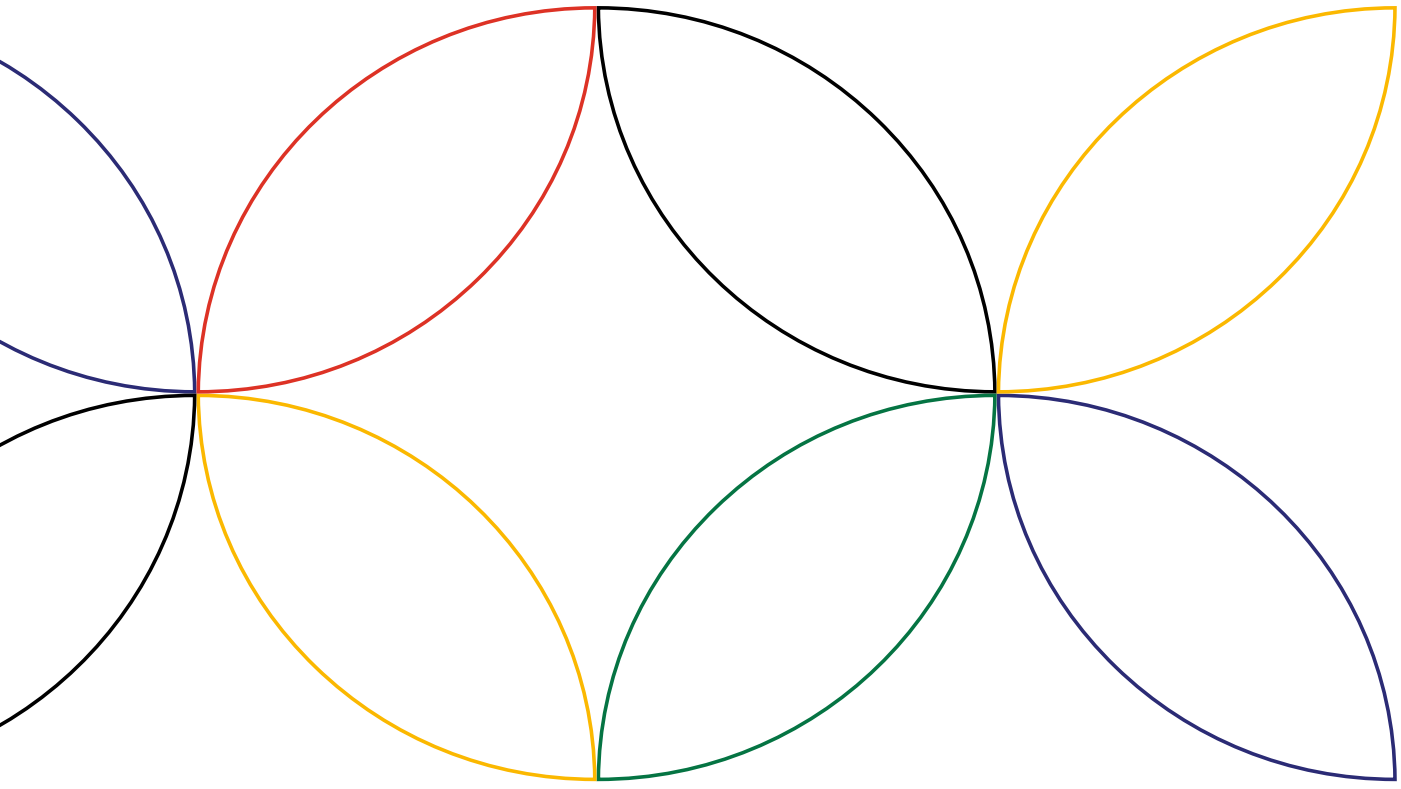
Furthermore, Action 4.1 significantly enhances KPI 4.2 by promoting the global adoption of LEIs and interoperable digital credentials. Clear policy frameworks and institutional mechanisms facilitate simplified pathways for MSMEs to register, thus increasing their participation in secure and efficient digital trade ecosystems.



Annexure E: List of abbreviations

AA	Account Aggregator
AI	Artificial Intelligence
API	Application Programming Interface
ACEIoT	African Centre of Excellence in Internet of Things
AWS	Amazon Web Services
DFFT	Data Free Flow with Trust
DPI	Digital Public Infrastructure
EMDEs	Emerging Market and Developing Economies
GDP	Gross Domestic Product
GLEIF	Global Legal Entity Identifier Foundation
GSMA	Global System for Mobile Communications Association
ICT	Information and Communication Technology
ID4D	Identification for Development
IoT	Internet of Things
ISP	Internet Service Provider
ITU	International Telecommunication Union
KPIs	Key Performance Indicators
LEI	Legal Entity Identifier
LLM	Large Language Model
MIT	Massachusetts Institute of Technology
MLEC	Model Law on Electronic Commerce
MLES	Model Law on Electronic Signatures
MLETR	Model Law on Electronic Transferable Records
MSMEs	Micro, Small and Medium-sized Enterprises
PPP	Public Private Partnership
PNSD	Piano Nazionale Scuola Digitale
OECD	Organisation for Economic Cooperation and Development
OFA	One Future Alliance
OHDSI	Observational Health Data Sciences and Informatics
RAI	Responsible AI

SMEs	Small and Medium-sized Enterprises
STEM	Science, Technology, Engineering and Mathematics
TVET	Technical Vocational Education and Training
UNESCO	United Nations Educational, Scientific and Cultural Organization
UPI	Universal Payments Interface
VAT	Value Added Tax
vLEIs	Verifiable LEIs
WEF	World Economic Forum



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